



"POLITEHNICA" UNIVERSITY OF TIMISOARA



**FACULTY
OF
AUTOMATION AND COMPUTERS**

ANNUAL REPORT

2006

Timisoara, 2007

**"POLITEHNICA" UNIVERSITY OF TIMISOARA
FACULTY OF AUTOMATION AND COMPUTERS**

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"Politehnica" University of Timisoara

FACULTY OF AUTOMATION AND COMPUTERS

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1 General Information

1.1 Brief History of the Faculty

The history of the Faculty of Automation and Computers is directly connected and influenced by the history of the Automation and Computers fields in our country. Three universities, in Timisoara, Cluj and Bucharest, are the places where the development of the mentioned fields begun.

The first computer designed and built in the Romanian academic environment, called MECIPT-1 ("Masina Electronica de Calcul a Institutului Politehnic Timisoara") was build in Timisoara, in 1959. It had impressive dimensions, huge power consumption but it was the beginning of the Computers field in Romania. It was followed by MECIPT-2 (1963) and MECIPT-3 (1965) which was already a computer from third generation, including a series of advanced hardware and software concepts.

Based on the mentioned achievements and on the experience gained by several engineers the education program of the first section of Computers begun in 1964 at the Institute "Politehnica" of Timisoara (today, the "Politehnica" University of Timisoara). The leader of the section was the Prof. Alexandru ROGOJAN. The computer staff was growing which carried on to the foundation of the Department of Electronics and Computers. In 1967 it became the Department of Computers, Electronics and Automation and later, in 1981, the Department of Automation and Computers. The first graduates in Computer specialization were leaving the faculty in 1969 and the first graduates in Automation specialization finished the studies in 1979. In 1975 the Electronic Computing center of the Institute "Politehnica" Timisoara was founded as a continuation of the MECIPT group.

The Department of Automation and Computers was part of the Faculty of Electrical Engineering. In 1990 it became the Faculty of Automation and Computers as part of the University "Politehnica" Timisoara. The curricula have been completely reconsidered and adapted to the new trends in the domain.

1.2 Structure of the Faculty

1.2.1 Executive Board of the Faculty

Dean:	Prof. Dr. Eng. Octavian PROȘTEAN	(octavian.prostean@ac.upt.ro)
Vice Deans:	Prof. Dr. Eng. Mircea STRATULAT	(mircea.stratulat@ac.upt.ro)
	Prof. Dr. Eng. Mircea POPA	(mircea.popa@ac.upt.ro)
Scientific Secretary:	Prof. Dr. Eng. Ștefan PREITL	(stefan.preitl@ac.upt.ro)

1.2.2 Faculty Council

Staff Members:

Prof. Dr. Eng. Octavian PROȘTEAN	Assoc. Prof. Dr. Eng. Ioan SILEA
Prof. Dr. Eng. Vladimir CREȚU	Prof. Dr. Eng. Nicolae ROBU
Prof. Dr. Eng. Toma-Leonida DRAGOMIR	Prof. Dr. Eng. Vasile STOICU–TIVADAR
Prof. Dr. Eng. Ștefan HOLBAN	Prof. Dr. Eng. Mircea STRATULAT
Prof. Dr. Eng. Ionel JIAN	Prof. Dr. Eng. Mariu CRISAN
Prof. Dr. Eng. Ioan JURCA	Prof. Dr. Eng. Mircea VLADUȚIU
Prof. Dr. Eng. Mircea POPA	Prof. Dr. Eng. Daniel-Gh. ANDREESCU
Prof. Dr. Eng. Radu-Emil PRECUP	Prof. Dr. Mat. Octavian LIPOVAN (invited)
Prof. Dr. Eng. Șefan PREITL	Assoc. Prof. Dr. Eng. Marius MINEA

Student Members:

Andreea MĂRGINEANU	Ana-Manuela STRINU
Camelia NICOLICIOIU	Bogdan VODĂ
Lavinia OPRESCU	Lucian LAURITZ

1.2.3 Faculty Departments

Department of Automation and Applied Informatics

Head of department: Assoc. Prof. Dr. Eng. Ioan SILEA
 2, Vasile Parvan Bv., 300223-Timișoara, Romania
 Phone: +40 256 403241
 Fax: +40 256 403214
 E-mail: *isilea@aut.upt.ro, secretar@aut.upt.ro*
 Web: *www.aut.upt.ro*

Department of Computer and Software Engineering

Head of department: Prof. Dr. Eng. Vladimir CREȚU
 2, Vasile Parvan Bv., 300223-Timișoara, Romania
 Phone: +40 256 403261
 Fax: +40 256 403214
 E-mail: *vcretu@cs.upt.ro, secretariat@cs.upt.ro*
 Web: *www.cs.upt.ro*

2 Faculty Departments

2.A Department of Automation and Applied Informatics

Correspondence address: 2, Vasile Parvan Bv., 300223-Timișoara, Romania
 Phone: +40 256 403241 (Secretary)
 +40 256 403247 (Head of Department)
 Fax: +40 256 403214
 E-mail: *ioan.silea@aut.upt.ro, secretariat@aut.upt.ro*
 Web: *www.aut.upt.ro*

Head of department: Assoc.Prof.Dr.Eng. Ioan SILEA
 Secretary: Lucica ANTON

2.A.1 Brief History

- 1959** The first automation course in the "Politehnica" University of Timisoara (at the Mechanical Faculty).
- 1960** The first automation course at the Electrical Engineering Faculty, Department of Measurements and Electrical Power Stations. The first teaching and research group has been formed in the automation field, coordinated by Professor Dr. Nicolae Budisan.
- 1967** Department of Electrical Engineering and Computers is changed to the Department of Computers, Electronics and Automation.
- 1972** The Department of Electronics, Automation and Measurements is formed.
- 1979** The first class of engineers specialized in "Industrial Automation" to graduate in Timisoara.
- 1981** The Department of Computers and Automation is created.
- 1983** The first class of automation engineers to graduate, specialized in "Process Control using Computers".
- 1985** The Timisoara branch of the Institute of Automation (IPA), Bucharest, is opened in the "Politehnica" University of Timisoara, under the coordination of Professor Dr. Nicolae Budisan and Assoc. Prof. Dr. Mircea Vladutiu.
- 1990** The Faculty of Automation and Computers is created.
- 1994** Post-graduate studies on "Modern Approaches in IT-Based Control".
- 1997** The three-year college in "Applied Informatics" is created.
- 1997** Master studies in the "Automated Systems" field.
- 2004** The Automation and Industrial Informatics Department changes into the Automation and Applied Informatics Department.

2.A.2 Department Board

Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU	Prof.Dr.Eng. Vasile STOICU-TIVADAR
Prof.Dr.Eng. Daniel-Ioan CURIAC	Assoc.Prof.Dr.Eng. Ioan FILIP
Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Assoc.Prof.Dr.Eng. Ioan SILEA
Prof.Dr.Eng. Ștefan PREITL	Lect.Dr.Eng. Dorina PETRICĂ
Prof.Dr.Eng. Octavian PROȘTEAN	T.Assist.Eng. Onuț LUNGU
Prof.Dr.Eng. Nicolae ROBU	

2.A.3 Academic Staff

Prof.Dr.Eng. Ioan BABU IA: Consulting professor
Prof.Dr.Eng. Nicolae BUDI AN: PhD. Supervisor, Consulting professor
Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU: PhD. Supervisor, Digital Circuit Design, Multiprocessor Systems, Computer Added Design of Complex Logical Circuits, Control Systems for Servo-Drives, Introduction to Robot Control

- Prof.Dr.Eng. Daniel-Ioan CURIAC:** Data Security Techniques, Knowledge-Based Systems, 3D Graphics, E-Commerce, Artificial Intelligence and Knowledge Engineering
- Prof.Dr.Eng. Toma-Leonida DRAGOMIR:** PhD. Supervisor, Systems Theory I, Systems Theory II, Automation and Systems Theory, Elements of Quality Management, Complement of Quality Engineering and Systems Theory
- Prof.Dr.Eng. Stefan PREITL:** PhD. Supervisor, Introduction to Automation, Control Structures and Algorithms, Control Engineering, Modern Control Theory 2
- Prof.Dr.Eng. Radu-Emil PRECUP:** PhD. Supervisor, Computer-assisted Mathematics, Advanced Control Strategies, Fuzzy Control Systems, Computer-Aided System Optimization, Advanced Control Systems, Modern Control Theory 1, Intelligent Control in Automotive Embedded Systems
- Prof.Dr.Eng. Octavian PRO TEAN:** PhD. Supervisor, Modeling, Simulation and Identification Elements, Modeling and Simulation, System Identification, Complex Automation, Electronic Control Systems, Adaptive Control Systems,
- Prof.Dr.Eng. Nicolae ROBU:** PhD. Supervisor, Computer Architecture, Concurrent Programming, Java Programming, Neural Networks, Embedded Systems 2
- Prof.Dr.Eng. L cr mioara STOICU-TIVADAR:** Computer Programming, Introduction in Computer Programming, Telemedicine, Medical Informatics, Biological Systems, Genetic Algorithm
- Prof.Dr.Eng. Vasile STOICU-TIVADAR:** Object-Oriented Programming, Programming Environments and Technologies, Programming Environments, Software Engineering, Windows Programming, Management of HealthCare Applications Programming, Software Engineering for Medical Informatics
- Assoc.Prof.Dr.Eng. Ioan FILIP:** Database, Internet Applications Programming, Interactive Simulation Tools, CASE Tools, Database Programming Technolgies
- Assoc.Prof.Dr.Eng. Ioan SILEA:** Computer Networks, Networks with Integrated Services
- Assoc.Prof.Dr.Eng. Constantin VOLO ENCU:** Standardization and Technical Graphics, Control of Industrial Processes, Fuzzy and Neural Systems, Control of Electrical Drives, Virtual Instrumentation in Control
- Lect.Dr.Eng. Florin DR GAN:** Operating Systems, Design WEB and XML Techniques, Intranet Networks, Computers Fundamentals
- Lect.Dr.Eng. Sorin NANU:** Microprocessor and microcontroller based systems, Signal Processing in Control, Equipments for Motion Control, Measurement Systems in Process Control, Fundamentals of Automation
- Lect.Dr.Eng. Dorina PETRIC :** Assembly Language, Data Structures and Algorithms, Artificial Intelligence, Expert Systems in Medicine
- Lect.Dr.Eng. Dorina POPESCU:** Languages for Artificial Intelligence, Control Systems Based on Microprocessor Equipments, System Theory, System Science, Fundamentals of Automation
- Lect.Dr.Eng. Antonius N. STANCIU:** The Management of Flexible Manufacturing Systems, Reliability of Medical Equipments, Using Personal Computers, Computer Architecture, Logic and Discrete Systems
- T.Assist.Eng. Adriana-Nicoleta ALBU:** Introduction to Computer Programming, Applied Computer Programming, Computer Operation, Java Programming, Concurrent Programming
- T.Assist.Eng. Radu BORACI:** Electronic Devices and Circuits. Fundamentals of Automations
- T.Assist.Eng. Dadiana CAIMAN:** Assembly Language, Data Structures and Algorithms
- T.Assist.Eng. Ana-Maria DAN:** System Theory I, System Theory II, Computer Added Design of Complex Logical Circuits
- T.Assist.Mat. Lavinia Elena DRAGOMIR:** Computer Assisted Mathematics, Data Structures and Algorithms
- T.Assist.Eng. Simona GHEJU:** Advanced Control Strategies, Control Engineering
- T.Assist.Eng. Tiberiu IONIC :** Digital Signal Processors, Machine-Tool Control, Distributed System for Data Acquisition and Control
- T.Assist.Eng. Levente KOVACS:** Introduction to Automation, Control Structures and Algorithms
- T.Assist.Eng. Onu LUNGU:** Computers Fundamentals, Programmable Logic Controllers, Process Automation in Flexible Manufacturing Structures

T.Assist.Eng. tefan OCTAVIAN: Computer Networks, System Theory, Automation and System Theory

T.Assist.Eng. Cezar POPESCU: Computer Architectures. Advanced Computer Architectures. Data Communications. Image Processing.

T.Assist.Eng. Zsuzsa PREITL: Introduction to Process Automation, Control Structures and Algorithms, Control Engineering

T.Assist.Eng. Claudiu Raul ROBU: Assembly Language, Data Structures and Algorithms

T.Assist.Eng. Iosif SZEIDERT: Modeling, Simulation and Identification Elements, Modeling and Simulation, System Identification, Electronic Control Systems, Automation/Electronics, Fundamentals of Automation, Internet Application Programming

T.Assist.Eng. Dan UNGUREANU: Microprocessor Based Systems, Microcontrollers, Real Time Operating Systems

T.Assist.Eng. Loredana-Mihaela UNGUREANU: Concurrent Programming, Computer Architecture, Java Programming, Embedded Systems

T.Assist.Eng. Cristian VA AR: Modeling and Simulation, System Identification, Automation/Electronics, Fundamentals of Automation

T.Assist.Eng. Eng. Emil VOI AN: Computers Fundamentals, Operating Systems

T.Assist.Eng. Gabriel VLASIU: Computer Networks, Networks with Integrated Services, Object-Oriented Programming

T.Assist.Eng. Ovidiu BANIA : Knowledge Based Systems, Information Security, Data Security Techniques

T.Assist.Eng. Daniel IERCAN: Programmable Logic Controllers, Data Security Techniques

PhD.Stud.Eng. Dan ALEXANDRU: Design WEB and XML Techniques, Operating Systems

PhD.Stud.Eng. Dorin BERIAN: Object-oriented programming, Programming Environments, Windows Programming, Medical Applications Programming, Telemedicine.

PhD.Stud.Eng. Bogdan GROZA: Artificial Intelligence, Computer System Security

PhD.Stud.Eng. Andrei GUDIU: Intranet Networks, Operating Systems

PhD.Stud.Eng. Adrian KORODI: System Theory I, System Theory II, System Theory and Automation, Computer Programming

Eng. Adrian POPA: Digital Circuit Design, Multiprocessor Systems

Eng. Florin OCOLI AN: Digital Circuit Design, Multiprocessor Systems

Eng. Mircea GIURGE: Computer-assisted Mathematics, Fuzzy Control Systems

2.A.4 Administrative and Technical Staff

1	Lucica ANTON	Secretary
2	Monika-Agneta ELEKE	Technician
3	Iuliana-Margareta CIOBANU	Technician
4	Eng. Gabriel VLASIU	Network engineer
5	M rioara STANJIC	Janitor
6	Tamara GOICOVICI	Janitor

2.A.5 Main Laboratories

B012 Laboratory	Electronics
B018 Laboratory	Control Engineering
B019 Laboratory	Applied Informatics
B020 Laboratory	System Science
B026 Laboratory	Concurrent Engineering
B027-a Laboratory	Modeling, Simulation/Database
B027-b Laboratory	Complex Automations
B028-a Laboratory	System Theory
B028-b Laboratory	Advanced (Intelligent) Control Systems
A304 Laboratory	Computer Bases

A307 Laboratory	Microprocessor and Micro-controller Systems
B611 Laboratory	Robot Control
B613 Laboratory	Real Time Programming
B614 Laboratory	Distributed Processing
B624 Laboratory	Analysis and Synthesis of Numerical Devices
CC1 + CC2 Laboratories	Using and Programming of Computers

2.A.6 Main Research Fields

- Process control systems and algorithms (see *Research Division in Automation and Industrial Informatics*, pp. 56, and *Autonomous Research Groups*, pp. 70)
- System Identification and Adaptive Systems (see *Research Division in Automation and Industrial Informatics*, pp. 56)
- Applied Informatics (see *Research Division in Automation and Industrial Informatics*, pp. 56)
- Real-Time Control Systems (see *Research Division in Automation and Industrial Informatics*, pp. 56)
- Applied Systems Theory (see *Autonomous Research Groups*, pp. 70)
- Cryptology and Information Security (see *Autonomous Research Groups*, pp. 70)

2.A.7 PhD Activity

PhD Advisors:

PhD Advisor	Number of Phd Students
Prof.Dr.Eng. Nicolae BUDIŞAN	10
Prof.Dr.Eng. Toma-Leonida DRAGOMIR	15
Prof.Dr.Eng. Octavian PROŞTEAN	9
Prof.Dr.Eng. Radu PRECUP	4
Prof.Dr.Eng. Ştefan PREITL	9
Prof.Dr.Eng. Nicolae ROBU	6
Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU	1

PhD programs:

Nr.	PhD Student	PhD Theme / Domain	PhD Advisor	Enrollment Date
1	Tiberiu IONICĂ	Automation domain	Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU	Oct.2006
2	Florin DRAGAN	Contributions to chaotic systems Control	Prof.Dr.Eng. Nicolae BUDIŞAN	Nov.1998
3	Alina BOGAN-MARTA	Contributions to speech processing	Prof.Dr.Eng. Nicolae BUDIŞAN Prof.Dr.Eng. Nicolae ROBU	Nov.2001
4	Adriana PRATA	Contributions to Internet commercial operation automation	Prof.Dr.Eng. Nicolae BUDIŞAN	Nov.2001
5	Adela BERDIE	Principles, methods and technologies for object-oriented soft systems standardization	Prof.Dr.Eng. Nicolae BUDIŞAN	Nov.2003
6	Ovidiu FALCAN	Study and integration of some electronic devices into unconventional generator sets control systems	Prof.Dr.Eng. Nicolae BUDIŞAN	Oct.2004
7	Bogdan MUSCA	Contributions to energy supply systems automation for remote sites exploitation, based on alternative energy sources	Prof.Dr.Eng. Nicolae BUDIŞAN	Oct.2004

8	Valentin NEDELEA	Contributions to microhydro groups optimal control	Prof.Dr.Eng. Nicolae BUDIŞAN	Oct.2004
9	Mihaela POPA	Contributions to variable rotation speed windmills structures and control methods	Prof.Dr.Eng. Nicolae BUDIŞAN	Oct.2004
10	Gabriel CULINCO	Contributions to winmills optimal Control	Prof.Dr.Eng. Nicolae BUDIŞAN	Oct.2004
11	Daniel TOADER	Contributions to energy supply systems for some agrcultural explotation	Prof.Dr.Eng. Nicolae BUDIŞAN	Oct.2004
12	Dadiana Valeria GRANDO	Analisis and sinthesys of non linear systems	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.1998
13	Adrian POPA	Control structures for electrical drives	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.1998
14	Sanda UNGUREANU	Control systems wit interpolative controllers	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.1998
15	Constantin Dorin BICHIS	Adapltive control in methan gas distribution	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Dec.1999
16	Ioan MOLDOVAN	Aspects regarding communication quality in control systems	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Dec.1999
17	Dorin BERIAN	Structures and strategies for large informatic systems for primary medical assistance	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.2000
18	Nagy Zoltan TAMAS	Intelligent selfdyangnosys control systems for machine tools	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.2000
19	Ovidiu Lucian MOLDOVAN	Control problems associated to hydroelectrical plant considering uncertainties	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.2001
20	Emil-Ioan VOIŞAN	Control problems for distributed systems applied in telematic	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.2002
21	Ana-Maria DAN	Applications of system theory in non industrial fields	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.2003
22	Adrian Stefan KORODI	Safety analisys for robotic systems	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Nov.2003
23	Sanda Valentina BĂLAŞ	Applications of intelligent systems in non industrial fields	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Oct.2004
24	Bogdan Ioan GROZA	Integrated safety cryptographic solutions in control systems	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Oct.2004
25	AurelianDorel IGNAT	Supervized control of complex systems	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Oct.2004
26	Cezar POPESCU	Automation domain	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Oct.2006
27	Ştefan OCTAVIAN	Automation domain	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	Oct.2006
28	Radu BORACI	Contributions to digital control structures synthesis of electric drive systems and of electrogen systems	Prof.Dr.Eng. Octavian PROŞTEAN	Dec.1999
29	Calin CÎRSTEA	Contributions to the development of distributed fault redundant systems	Prof.Dr.Eng. Octavian PROŞTEAN	Nov.2003
30	Andrei GUDIU	Contributions regarding the distributed system's remote control	Prof.Dr.Eng. Octavian PROŞTEAN	Oct.2004
31	Dan Lucian MIHAILESCU	Contributions regarding the analysis, modeling and control of distributed systems	Prof.Dr.Eng. Octavian PROŞTEAN	Oct.2004
32	Iosif SZEIDERT	Control systems used in unconventional energetics	Prof.Dr.Eng. Octavian PROŞTEAN	Dec.1999

33	Dan UNGUREANU	Contributions at modeling and optimization of discrete event systems	Prof.Dr.Eng. Octavian PROȘTEAN	Nov.2002
34	Cristian VASAR	Contributions regarding the neuro-fuzzy structures usage in system identification	Prof.Dr.Eng. Octavian PROȘTEAN	Dec.1999
35	Arsene Vincentiu RADOI	Automation domain	Prof.Dr.Eng. Octavian PROȘTEAN	Oct 2006
36	Ana Daniela CRISTEA	Automation domain	Prof.Dr.Eng. Octavian PROȘTEAN	Oct.2006
37	Zsuzsa PREITL	Contributions to the development of model-based control structures	Prof. Radu-Emil PRECUP	Oct.2004
38	Marian STAN	Contributions to the development of control structures dedicated to vehicle braking systems	Prof. Radu-Emil PRECUP	Oct.2004
39	Ovidiu BANIAȘ	Contributions to process control based on sensor networks	Prof. Radu-Emil PRECUP	Oct.2005
40	Adrian Sebastian PAUL	Contributions to automatic control problems in digital audio signal processing	Prof. Radu-Emil PRECUP	Oct.2006
41	Doru COROBAN	Contributions on analysis and development of advanced control structures	Prof.Dr.Eng. Ștefan PREITL	Nov.2001
42	Levente KOVACS	Contributions on development of multivariable control structures	Prof.Dr.Eng. Ștefan PREITL	Nov.2001
43	Corina LAMOS	Contributions on development of fuzzy control structures	Prof.Dr.Eng. Ștefan PREITL	Nov.2002
44	Csongor SZABO	Contributions on development of control structures for mobile robots	Prof.Dr.Eng. Ștefan PREITL	Oct.2004
45	Laszlo SZONYI	Contributions on development of control structures in automotive control applications	Prof.Dr.Eng. Ștefan PREITL	Nov.2001
46	Marius TOMESCU	Contributions on development of fuzzy control structures	Prof.Dr.Eng. Ștefan PREITL	Nov.2003
47	Nicolae VULPES	Contributions on control structures, fault diagnosis and monitoring of hydroelectric groups	Prof.Dr.Eng. Ștefan PREITL	Nov.2000
48	Simona GHEJU	Contributions on development of control structures for plants with delay	Prof.Dr.Eng. Ștefan PREITL	Oct.2005
49	Peter BALAZS	Contributions to the development of traffic control systems	Prof.Dr.Eng. Ștefan PREITL	Oct.2006
50	Dan-Teodor ALEXANDRU	Computer science domain	Prof.Dr.Eng. Nicolae ROBU	Oct.2005
51	Iercan DANIEL	Computer science domain	Prof.Dr.Eng. Nicolae ROBU	Oct.2005
52	Alexander SCHEID (from Germany)	Computer science domain	Prof.Dr.Eng. Nicolae ROBU	Oct.2005
53	Roman MAGDA (from Serbia)	Computer science domain	Prof.Dr.Eng. Nicolae ROBU	Oct.2005
54	Csaba VAJDA	Computer science domain	Prof.Dr.Eng. Nicolae ROBU	Oct.2006
55	Eberhard MUELLER (from Austria)	Computer science domain	Prof.Dr.Eng. Nicolae ROBU	Oct.2006

PhD Theses published in 2006:

Nr.	Author	Title	Scientific Supervisor	Publication Date
1	Sanda DALE (UNGUREANU)	Contribution to the study of Control Systems with Interpolative Controllers	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	18.11.2006
2	Cristian SAVII	Conception and realization of user interfaces in CAD-CAM applications development	Prof.Dr.Eng. Octavian PROȘTEAN	16.02.2006

PhD Reports published in 2006:

Nr.	Author	Title	Scientific Supervisor	Publication Date
1	Aurelian Dorel IGNAT	Multivariable Linear Systems - state of the art	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	31.03.06
2	Adrian KORODI	Control Structures for robots	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	21.07.06
3	Bogdan GROZA	The necessity of cryptographic secure techniques for industrial systems. Cryptographic solutions for authentication based on one way chains	Prof.Dr.Eng. Toma-Leonida DRAGOMIR	21.07.06
4	Iosif SZEIDERT	Identification, parameter estimation and simulation of systems with induction generators	Prof.Dr.Eng. Octavian PROȘTEAN	07.05.06
5	Calin CÎRSTEA	Actual stage of the researches in the domain of fault redundant distributed systems	Prof.Dr.Eng. Octavian PROȘTEAN	07.05.06
6	Cristian VAȘAR	Neural networks used for system identification and control	Prof.Dr.Eng. Octavian PROȘTEAN	08.04.06
7	Dan UNGUREANU	The modeling and simulation of discrete event systems using Petri nets and sequential automata	Prof.Dr.Eng. Octavian PROȘTEAN	21.03.06
8	Ovidiu BANIAȘ	Sensor network architecture for traffic control	Prof.Dr.Eng. Radu PRECUP	07.04.06
9	Ovidiu BANIAȘ	Contributions to automatic control problems in digital audio signal processing – research program project presentation	Prof.Dr.Eng. Radu PRECUP	28.09.06
10	Zsuzsa PREITL	Analysis and design of control structures based on Internal Model Control (IMC) in presence of restrictions and disturbances	Prof.Dr.Eng. Radu PRECUP	23.10.06
11	Marius TOMESCU	Applications of fuzzy mechanisms in plant control	Prof.Dr.Eng. Ștefan PREITL	16.06.06

2.A.8 Department Events

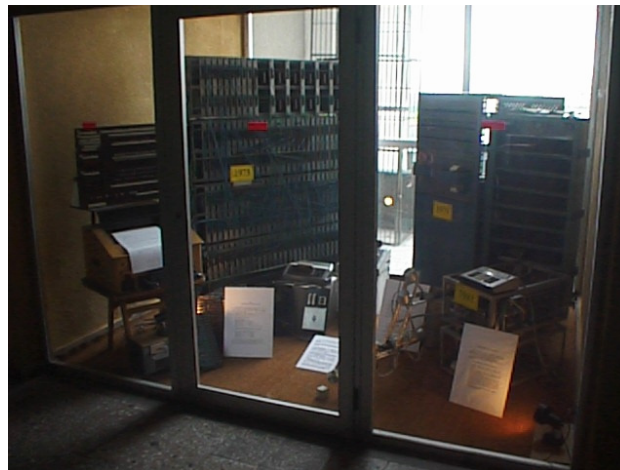
- "Doctor Honoris Causa" Title awarded to Prof.Dr.Eng. Iósef BOKOR, member of the Hungarian Academy
- Oct, 2006: The department of Automation and Applied Informatics has collaborated with the company National Instruments Debrecen, and this collaboration was materialized by organizing The National Instruments Day in Timisoara, a professional contest for students as well as awarding a grant for equipment and programs

2.C Department of Computer and Software Engineering

Correspondence address: 2, Vasile Parvan Bv., 300223-Timișoara, Romania
 Phone: +40 256 403261 (Secretary)
 +40 256 403255 (Head of Department)
 Fax: +40 256 403214
 E-mail: vladimir.cretu@cs.upt.ro, secretariat@cs.upt.ro
 Web: www.cs.upt.ro
 Head of department: Prof.Dr.Eng. Vladimir CREȚU
 Secretary: Maria DUMITROV, Eng. Alexandru PETÖFI

2.C.1 Brief History

- 1960** In the Politehnic Institute of Timisoara, the *MECIPT Research Center* ("Electronic Computing Machine at the Politehnic Institute of Timisoara") is set up.
- 1961** At the *MECIPT Research Center*, the *MECIPT-1* is developed, as *the first digital computer built in an academic laboratory in Romania*. The MECIPT-1 was a first generation computer with advanced features (microprogramming). The initiators: I. Kaufmann, W. Lovenfeld and M. Fildan.
- 1963** First course on "Electronic Computers", at the Faculty of Electrical Engineering in Timisoara.
- 1963** Important research results and achievements in the domain of ferrite core memories. First Romanian ferrite memory produced.
- 1964** First group of students in "Computers" is set up.
- 1964** The Computer Science Department is set up. The first Head of department: *Professor Dr. Alexandru Rogojan*.
- 1966** First class of engineers specialized in "Electronic Computers" to graduate in Timisoara. The Ministry of Education grants the first "Electronic Computers" section in Romania, at the Politehnic Institute of Timisoara, due to the efforts of the staff collective coordinated by professor Rogojan.
- 1983** First implementation of the *Concurrent Pascal Language Compiler (Professor Dr. Aurel Soceneanțu)*.
- 1984** First *Pascal* Compiler for the Romanian FELIX computers is developed.
- 1990** The *Faculty of Automation and Computers* is set up at the Politehnic Institute of Timisoara.
- 1996** The Computer Science Department becomes "*Computer and Software Engineering Department*".



2.C.2 Department Board

Prof.Dr.Eng. Vladimir CREȚU
Prof.Dr.Eng. Mircea STRATULAT
Prof.Dr.Eng. Mircea POPA
Prof.Dr.Eng. Ioan JURCA
Prof.Dr.Eng. Ștefan HOLBAN
Prof.Dr.Eng. Marius CRIȘAN

Prof.Dr.Eng. Ionel JIAN
Assoc.Prof.Dr.Eng. Marius MINEA
Assoc.Prof.Dr.Eng. Ioana ȘORA
Assoc.Prof.Dr.Eng. Mihai V. MICEA
Assoc.Prof.Dr.Eng. Dan PESCARU

2.C.3 Academic Staff

Prof.Dr.Eng. Vladimir CREȚU: Data Structures and Algorithms, Algorithm Design and Analysis, Data Structures and Algorithm Analysis, Real-Time Programming Systems, Software Project Management, Real-Time UML

Prof.Dr.Eng. Cri an STRUGARU: Input-Output Systems, Local Area Computer Networks, Peripheral Equipments, Computer Network Design

Prof.Dr.Eng. Mircea VL DU IU: Computer Architecture, Computer Organization, Computer Engineering 1 and 2, Computing Systems Testing, Hardware-Software Co-Design, Emerging Technologies

Prof.Dr.Eng. Ștefan HOLBAN: Basic Concepts of Artificial Intelligence, Modeling and Simulation, Artificial Intelligence, Data Mining

Prof.Dr.Eng. Ioan JURCA: Object-Oriented Programming, Fundamentals of Software Engineering, Operating Systems 1 and 2, Software Engineering 1, Programming Systems for Computer Networks, Distributed Systems Design

Prof.Dr.Eng. Mircea STRATULAT: Digital Circuits and Signals, Integrated Circuits, Large Scale Integrated Circuits, Semiconductor Memories, Digital Data Acquisition and Processing, High-End Interfaces and Equipments, Optical Fiber Transmissions, Digital Control Systems

Prof.Dr.Eng. Ionel JIAN: Assembly Language Programming, Database Systems, Database Systems Design, Distributed Database Systems

Prof.Dr.Eng. Horia CIOCĂRLIE: Computer Programming, Programming Techniques, Fundamental Concepts of Programming Languages, Compiling Techniques, Translator Design, Heuristic Methods

Prof.Dr.Eng. Marius CRIȘAN: Logic and Discrete Structures, Theory of Computation, Artificial Intelligent Systems, Machine Learning, Advanced Artificial Intelligence and Cognitive Models

Prof.Dr.Eng. Mircea POPA: Digital Microsystems Design, Microprocessor-Based Systems, Application-Oriented Embedded Systems, Parallel Architectures, Embedded Systems

Assoc.Prof.Dr.Eng. Hora iu MOLDOVAN: Image Processing and Recognition

Assoc.Prof.Dr.Eng. Marius MINEA: Computer System Security, Software Verification and Validation, Formal Verification

Assoc.Prof.Dr.Eng. Ioana ȘORA: Parallel Computing Algorithms, Component-Based Software Engineering

Assoc.Prof.Dr.Eng. Mihai V. MICEA: Digital Signal Processing, Modern Digital Telecommunications, Advanced Digital Signal Processing

Assoc.Prof.Dr.Eng. Dan PESCARU: Expert Systems

Assoc.Prof.Dr.Eng. Radu MARINESCU: Software Engineering 2, Software Quality Assurance

Assoc.Prof.Dr.Eng. Marius MARCU: Hardware Resources Handling and Auto-configuration Techniques, Multiprocessor Systems

Assoc.Prof.Dr.Eng. Doru TODINȚ : Computer Aided Design Techniques, Fuzzy Logic and Applications, Mobile Communication Systems

Lect.Dr.Eng. Lucian PRODAN: Fault Tolerant Systems

Lect.Dr.Eng. Mihai UDRESCU-MILOSĂV: Computing Systems Reliability

T.Assist.Eng. Carmen HOLOTESCU: Internet technologies

T.Assist.Eng. Sorin BABII: Elements of Computer Graphics, Computer graphic systems

T.Assist.Eng. Adrian MIHĂILESCU: Analysis and Synthesis of Numerical Devices 1 and 2

T.Assist.Eng. Constantin COSOVAN: Quality in Information Technology, Computer Aided Integrated Production Systems

T.Assist.Eng. Sebastian FUCU: Local Area Networks, Input/Output Systems

T.Assist.Eng. Dan CHICIUDEAN: Digital Signal Acquisition and Processing, Semiconductor Memories, Evolved Interfaces and Equipments, Computer Aided Design Techniques

T.Assist.Eng. R zvan CIOARG : Peripheral Equipments

T.Assist.Eng. Bogdan CIUBOTARU: Integrated Circuits 1

T.Assist.Eng. Mirella MIOC: Computer Use and Programming, Computer Programming 1

T.Assist.Eng. Dan COSMA: Operating Systems 1, Programming Systems for Computer Networks

T.Assist.Eng. Sorin ER U: Assembly Language Programming

T.Assist.Eng. Daniela ST NESCU: Integrated Circuits 1 and 2

T.Assist.Eng. Ciprian CHIRIL : Data Structures and Algorithm Analysis, Compiling Techniques

T.Assist.Eng. C lin JEBELEAN: Data Structures and Algorithm Analysis, Compiling Techniques, Basics of Artificial Intelligence

T.Assist.Eng. Petre MIERLU IU: Operating Systems 1 and 2

T.Assist.Eng. Cristina MARINESCU: Parallel Computing Algorithms, Object-Oriented Programming

T.Assist.Eng. Gabriela BOBU: Computer Programming 1 and 2

T.Assist.Eng. Versavia ANCU A: Computer Engineering 1 and 2, Computer System Testing

T.Assist.Eng. Elena DOANDE : Computer Use and Programming

T.Assist.Eng. Sebastian GLI : Computer Use and Programming, Data Structures and Algorithms

T.Assist.Eng. Petru MIHANEA: Object-Oriented Programming, Operating Systems 1

T.Assist.Eng. Ovidiu PÂRVU: Computer Use and Programming, Computer Graphics

T.Assist.Dr.Eng. Oana Maria C U : Programming Techniques (C, L), Computer Programming (L), Fundamentals of Programming Languages (L), Programming Languages (L)

T.Assist.Eng. Cosmin CERN ZANU-GL VAN: Basic Concepts of Artificial Intelligence (L), Artificial Intelligence (L)

T.Assist.Eng. Dan CIRE AN: Expert Systems

T.Assist.Eng. Alexandru AM RIC I: Computer Engineering 1 (L, P), Computer Engineering 2 (L)

T.Assist.Eng. Oana BONCALO: Computer Fundamentals (L), Computer Engineering 2 (L)

PhD.Stud.Eng. Roxana TEODORESCU: Data Structures and Algorithms (L), Data Structures and Algorithm Analysis (L)

2.C.4 Administrative and Technical Staff

1	Maria DUMITROV	Secretary
2	Alexandru PETÖFI	Secretary
3	Rodica CIOCÂRLIE	Engineer
4	Ambroziu B LAN	Technician
5	Maria STOLOJESCU	Technician
6	Pavel GARTNER	Technician
7	Herta OPRI AN	Janitor
8	Maria CURESCU	Janitor
9	Floare GOLBAN	Janitor

2.C.5 Main Laboratories

A305 Laboratory	Data Structures and Algorithms; Real-Time Programming
B413-a Laboratory	Embedded Systems; Parallel Computer Architectures
B413-b Laboratory	Microprocessor and Microcontroller-Based Systems
B414 Laboratory	Local Area Networks; Peripheral and I/O Equipments
B418-a Laboratory	Computer Use and Programming
B418-b Laboratory	Database Systems
B419 Laboratory	Artificial Intelligence; VLSI Design

B424 Laboratory	Digital Signal Acquisition Systems
B425 Laboratory	Integrated Circuits; Semiconductor Memories
B426 Laboratory	Computer Use and Programming; Formal Verification
B513 Laboratory	Digital Signal Processing Laboratories ("DSPLabs")
B511 Laboratory	Digital Signal Processing Laboratories ("DSPLabs")
B514 Laboratory	Object-Oriented Programming; Software Engineering
B515 Laboratory	Analysis and Synthesis of Digital Devices
B520 Laboratory	Computer Architecture; Computer Engineering
B521 Laboratory	"ROEDU" Network Operating Center Timisoara
B527 Laboratory	Computer and Software Engineering Research Lab
B528-a Laboratory	Operating Systems
B528-b Laboratory	Software Engineering; Distributed Programming
B529 Laboratory	Artificial Intelligence; Compiler Systems
B623 Laboratory	Database Systems; Assembly Language Programming
S4 Laboratory	Computer Programming
P14 Laboratory	Artificial Intelligence; Modeling and Simulations
P17 Laboratory	Computer Graphics
P18 Laboratory	Computer Programming

2.C.6 Main Research Fields

- Architectures and Advanced Computing Systems (see *CC-SICTI-UPT Research Center*, pp. 63)
- Data Bases and Artificial Intelligence (see *CC-SICTI-UPT Research Center*, pp. 63)
- Software Engineering (see *CC-SICTI-UPT Research Center*, pp. 63)
- Real-Time and Embedded Systems and Digital Signal Processing (see *CC-SICTI-UPT Research Center*, pp. 63)
- Electrical Machine and Equipment Testing Using Digital Signal Acquisition and Processing Systems (see *CC-SICTI-UPT Research Center*, pp. 63)

2.C.7 PhD Activity

PhD Advisors:

PhD Advisor	Number of Phd Students
Prof.Dr.Eng. Crişan STRUGARU	2
Prof.Dr.Eng. Mircea VLĂDUŢIU	13
Prof.Dr.Eng. Ioan JURCA	6
Prof.Dr.Eng. Ştefan HOLBAN	16
Prof.Dr.Eng. Vladimir CREŢU	16
Prof.Dr.Eng. Mircea STRATULAT	10
Prof.Dr.Eng. Ionel JIAN	2
Prof.Dr.Eng. Horia CIOCĂRLIE	4

PhD programs:

Nr.	PhD Student	PhD Theme / Domain	PhD Advisor	Enrollment Date
1	Cristin TODOR	Hierarchical Control and Programming Systems for Robots	Prof.Dr.Eng. Crişan STRUGARU	Nov.2003
2	Florin FRÂNC	Multiprocessor Architectures for Electronic Transactions in the Banking System	Prof.Dr.Eng. Crişan STRUGARU	Oct.2003
3	Ciprian COMLOŞAN	Researches on Routing Optimization of Information Packets in Wireless Computer Networks	Prof.Dr.Eng. Mircea VLĂDUŢIU	Nov.2003
4	Emanuel SASU	Researches on Error Testing Stages for Computer Networks	Prof.Dr.Eng. Mircea VLĂDUŢIU	Nov.2003

5	Petre POPESCU ROTOIU	Researches on Increasing the Efficiency of Information Security Through Reconfigurable Structures	Prof.Dr.Eng. Mircea VLĂDUȚIU	Oct.2004
6	Versavia ANCUȘA	Consensus Problem in Fault Tolerant Computing	Prof.Dr.Eng. Mircea VLĂDUȚIU	Oct.2005
7	Cristian RUCAN	Automatic Synthesis of Quantum Circuits Using Genetic Algorithm	Prof.Dr.Eng. Mircea VLĂDUȚIU	Oct.2005
8	Alexandru AMĂRICĂI	On the Design of Floating Point Units for Interval Arithmetic	Prof.Dr.Eng. Mircea VLĂDUȚIU	Sep.2006
9	Oana BONCALO	Simulation – Based Assessment of Quantum Circuit Reliability	Prof.Dr.Eng. Mircea VLĂDUȚIU	Sep.2006
10	Elena DOANDEȘ	Studies on Applying the Interaction Design Methods	Prof.Dr.Eng. Mircea VLĂDUȚIU	Sep.2006
11	Nicolae VELCIOV	Design and Security Assessments of Symmetric-Key Cryptosystems	Prof.Dr.Eng. Mircea VLĂDUȚIU	Sep.2006
12	Răzvan Virgil BOGDAN	A Data Security Perspective on Information Transmission Over Distributed Systems	Prof.Dr.Eng. Mircea VLĂDUȚIU	Sep.2006
13	Marius CĂVĂȘDAN	Claim Base Authentication Mechanism for Web Services	Prof.Dr.Eng. Mircea VLĂDUȚIU	Sep.2006
14	Stejărel Claudiu VEREȘ	Computer Networks Performance Improvement Based on Traffic Analysis	Prof.Dr.Eng. Ioan JURCA	Nov.2003
15	Cristina MARINESCU	Quality Assurance in Distributed Software Systems	Prof.Dr.Eng. Ioan JURCA	Oct.2004
16	Petru MIHANEA	Object-Oriented Software Systems Analysis	Prof.Dr.Eng. Ioan JURCA	Oct.2004
17	Andrei Răzvan RIȘCUȚA	Anthologies Design for Semantic Web	Prof.Dr.Eng. Ioan JURCA	Oct.2005
18	Dan CIREȘAN	Automatic Handwriting Recognition for the Romanian Language	Prof.Dr.Eng. Ștefan HOLBAN	Nov.2002
19	Cosmin CERNĂZEAN	Contributions to Artificial Neural Networks Dimensioning	Prof.Dr.Eng. Ștefan HOLBAN	Nov.2002
20	Diana Maria ANDONE	Contributions to Development of E-Learning Informational Technologies	Prof.Dr.Eng. Ștefan HOLBAN	Nov.2003
21	Eugenia LUCHIAN	Expert Systems in Accounting and Finance Informatics	Prof.Dr.Eng. Ștefan HOLBAN	Oct.2003
22	Nicolae Teodor MELIȚĂ	Contributions to Data Analysis and Processing in Genetic Analysis	Prof.Dr.Eng. Ștefan HOLBAN	Nov.2003
23	Ildiko SZOKE	Contributions to Fractal Utilization in Pattern Recognition Techniques	Prof.Dr.Eng. Ștefan HOLBAN	Nov.2003
24	Adrian ZAFIU	Contributions to Formal Analysis of Software Applications	Prof.Dr.Eng. Ștefan HOLBAN	Nov.2003
25	Gabriela BOBU	Software Agents for GRID (Development)	Prof.Dr.Eng. Ștefan HOLBAN	Oct.2004
26	Dan Ciprian CIUBOTARU	Information Indexing Based on Graphs and Data Mining Techniques	Prof.Dr.Eng. Ștefan HOLBAN	Oct.2004
27	Mihai CHEVEREȘAN	Methods for Improving the Execution Speed of Uniprocessor Systems	Prof.Dr.Eng. Ștefan HOLBAN	Oct.2004
28	Adrian DELAMARIAN	Analysis of Programs Written in Pointer-Based Languages	Prof.Dr.Eng. Ștefan HOLBAN	Oct.2004
29	Helios Dumitru MELENCU	Contributions to Developing Architectures for Distributed Databases of Large Dimensions	Prof.Dr.Eng. Ștefan HOLBAN	Oct.2004
30	Cătălin STOIAN	Contributions to Recognition of GIS Database Objects Using Data Mining	Prof.Dr.Eng. Ștefan HOLBAN	Oct.2006
31	Georgeta TURCU	Contributions to Data Exploration Methodology in Data Store	Prof.Dr.Eng. Vladimir CREȚU	Nov.2002
32	Călin JEBELEAN	Contributions to Automatic Refactorization of Object-Oriented Code	Prof.Dr.Eng. Vladimir CREȚU	Nov.2002
33	Adrian NAGY	Contributions to Performance Improvement and Security Enhancement of Data Stores	Prof.Dr.Eng. Vladimir CREȚU	Nov.2003

34	Adrian NIȚĂ	Cryptographic Algorithms	Prof.Dr.Eng. Vladimir CREȚU	Nov.2003
35	Dacian Florin TUDOR	Auto-Configurable Software Management for GRID-Type Architectures	Prof.Dr.Eng. Vladimir CREȚU	Oct.2004
36	Sorin BABII	Performance Enhancement of Neural Networks in a Distributed Environment	Prof.Dr.Eng. Vladimir CREȚU	Oct.2005
37	Răzvan CIOARGĂ	Emergent Behavior in a Robotic Collaborative Environment	Prof.Dr.Eng. Vladimir CREȚU	Oct.2005
38	Carmen HOLOTESCU	E-Learning. Formalization and syndications of learning scenarios	Prof.Dr.Eng. Vladimir CREȚU	Oct.2005
39	Georgiana Laura SILAȘ	Automatic Code Generation and Configuration for Embedded Systems	Prof.Dr.Eng. Vladimir CREȚU	Sep.2006
40	Roxana Oana TEODORESCU	Advanced Image Processing	Prof.Dr.Eng. Vladimir CREȚU	Sep.2006
41	Adina Eūnice TUȚAC	Advanced Image Processing	Prof.Dr.Eng. Vladimir CREȚU	Sep.2006
42	Artur KUCZAPSKI	Critical Real-Time Systems. Planning and Validation Methodologies	Prof.Dr.Eng. Vladimir CREȚU	Sep.2006
43	Cristian Horațiu DRĂGAN	Contributions to Modern Multimedia Technologies Utilization	Prof.Dr.Eng. Mircea STRATULAT	Nov.2003
44	Daniela STĂNESCU	Contributions to Steganography Utilization for Data Protection and Transmission in Computer Systems	Prof.Dr.Eng. Mircea STRATULAT	Nov.2003
45	Zsolt Levente HUSZ	Reactive Sciences Controlled Through Behaviors	Prof.Dr.Eng. Mircea STRATULAT	Oct.2004
46	Dan CHICIUDEAN	Contributions to the Field of Heterogenous Robotic Systems With Autonomous Navigation	Prof.Dr.Eng. Mircea STRATULAT	Oct.2005
47	Bogdan CIUBOTARU	Contributions to the Field of Sensor Network Architectures	Prof.Dr.Eng. Mircea STRATULAT	Oct.2005
48	Sorin ȘERĂU	Contributions to Distributed Databases	Prof.Dr.Eng. Ionel JIAN	Oct.2003
49	Ovidiu PÂRVU	Research on Using Graphic Accelerators in the Field of Databases	Prof.Dr.Eng. Ionel JIAN	Sep.2006

PhD Theses published in 2006:

Nr.	Author	Title	Scientific Supervisor	Publication Date
1	Mirela-Alexandrina PATER	Contributions to Development of Data Extraction Algorithms from Multi-Level Databases	Prof.Dr.Eng. Ionel JIAN	17.07.2006
2	Cornel BARNĂ	Contributions to Development of Surveillance Systems in the External Environment	Prof.Dr.Eng. Mircea STRATULAT	17.07.2006
3	Rodica TIRTEA	Contributions to Improving the Dependability and Security of the Information	Prof.Dr.Eng. Mircea VLADUȚIU	13.11.2006

PhD Reports published in 2006:

Nr.	Author	Title	Scientific Supervisor	Publication Date
1	Adrian ZAFIU	Classical and Modern Methods of Decisional Systems Analysis	Prof.Dr.Eng. Ștefan HOLBAN	20.01.06
2	Călin JEBELEAN	State of the Art in the Field of Object- Oriented Code Refactorization	Prof.Dr.Eng. Vladimir CREȚU	13.02.06

3	Ionel MUSCALAGIU	Implementation, Evaluation and Performance Improvement of Asynchronous Search Techniques Within Distributed Constraints - Based Programming	Prof.Dr.Eng. Vladimir CREȚU	19.06.06
4	Cristina MARINESCU	Quality Assessment of Enterprise Software Systems	Prof.Dr.Eng. Ioan JURCA	05.06.06
5	Bogdan Ciprian CHIRILĂ	State of the Art in Reuse Mechanisms of Object-Oriented Programming	Prof.Dr.Eng. Ioan JURCA	20.03.06
6	Dan COSMA	Understanding and Qualitative Analysis of Distributed Systems Design	Prof.Dr.Eng. Ioan JURCA	06.07.06
7	Dan CIREȘAN	Methods for Character Recognition	Prof.Dr.Eng. Ștefan HOLBAN	30.09.06
8	Radu IRHAȘIU	Detection Systems for Attacks in Computer Networks: State of the Art and Prospects	Prof.Dr.Eng. Ioan JURCA	20.11.06
9	Dan CIREȘAN	Pattern Recognition: Conserving Topology Through Windowed Hough Transform	Prof.Dr.Eng. Ștefan HOLBAN	16.10.06
10	Sorin BABII	Neural Networks: State of the Art and Prospects	Prof.Dr.Eng. Vladimir CREȚU	06.11.06
11	Sorin BABII	Data Par Sim: Parallel Simulator with Data Partitioning	Prof.Dr.Eng. Vladimir CREȚU	11.12.06

2.C.8 Department Events

Conferences:

- December, 2006: Crișan STRUGARU, "Communications in the Present Days", presented at the Conference Series "Technical Progress", organized by the Academy of Technical Sciences of Romania, Timisoara Branch

Academic Events:

- May, 2006: "Doctor Honoris Causa" Title awarded to Prof.Dr.Eng. Mircea PETRESCU
- June, 2006: "40 Years Since the Setup of the Computers Section in Timisoara"

3 Educational Activity

3.1 Educational Programs

Education is organized according to the Transferable Credits System (ECTS).

At present, the Faculty of Automation and Computers consists of two departments: Automation and Applied Informatics Department and Computers and Software Engineering Department, ensuring, for more than 2000 students, education in the following areas of specializations:

- Automation and Applied Informatics (5 years)
- Computers (5 years)

The Faculty offers also Master programs in the following directions:

- Automatic Systems (2 years)
- Advanced Computing Systems (2 years)
- Automotive Embedded Software (2 years)

Conforming to the Bologna process, our system and curricula were modified and adapted to the fast evolution of the Automation and Computer fields. Therefore, our faculty offers a levered education, in three domains, the first level being:

- Computers and Information Technology (4 years)
- Systems Engineering (4 years)
- Informatics (3 years)

The studies will be continued with the Master level of 2 years and with the third level, for Doctoral studies, which is supervised by the 12 doctoral leaders from our faculty.

The education program was completed with a constant research activity consisting of many research contracts, grants, papers published at important conferences and in journals, books and education materials.

Enrolment of students in the first year follows an admission examination (based on Multiple – Choice Queries tests) where general knowledge in Mathematics (Algebra, Analysis, Geometry and Trigonometry) is assessed (80%). The final score takes also into account the Baccalaureate score (20%). Graduates of other faculties that were awarded a license diploma can be directly enrolled.

Graduation is conditioned by passing of the License examination and oral defense of the graduation project.

Number of students:

Five-year programs	1394
Four-year programs	431
Master's programs	85
<hr/>	
Total number of students	1910

Number of graduates in 2006:

Five-year programs	254
Master's programs	62
<hr/>	
Total number of students	316

3.2 Curricula and Syllabus

3.2.A Automation and Applied Informatics Section

3.2.A.1 Curricula

Systems Engineering Specialization (SE, 4 years)

First Year of Study						
Nr. "xx"	Course Name (Code: "SE-1-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Mathematical Analysis	4	28	28	–	–
02	Algebra and Geometry	4	28	28	–	–
03	Computer Programming	5	28	–	28	7
04	Physics	4	28	14	14	–
05	Fundamentals of Mechanical Engineering	4	28	14	14	–
06	Standards and Technical Graphics	4	28	7	–	7
07	International Languages 1	2	–	28	–	–
08	Sports 1	1	–	14	–	–
09	Applied Activities (45 hours)	2	–	–	–	–
10	Special Mathematics	4	28	28	–	–
11	Computer Assisted Mathematics	4	28	–	28	–
12	Data Structures and Algorithms	4	28	–	14	14
13	Fundamentals of Electrical Engineering	5	28	14	14	–
14	Electronic Devices and Circuits	4	28	–	21	7
15	Computers Fundamentals	4	28	–	28	–
16	International Languages 2	2	–	28	–	–
17	Sports 2	1	–	14	–	–
18	Applied Activities (45 hours)	2	–	–	–	–

Second Year of Study						
Nr. "xx"	Course Name (Code: "SE-2-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	System Theory 1	5	28	7	21	–
02	Measurement Principles, Techniques and Devices	4	28	7	14	–
03	Object-Oriented Programming	5	28	–	21	7
04	Introduction to Automation	4	28	7	14	–
05	Digital Circuit Design	4	28	–	21	7
06	Computer Architecture	4	28	–	21	7
07	Culture and Civilization	1	14	14	–	–
08	Sports 3	1	–	14	–	–
09	Applied Activities (45 hours)	2	–	–	–	–
10	System Theory 2	4	28	7	21	–
11	Database	5	28	–	21	7
12	Concurrent Programming	5	28	–	21	7
13	Modeling, Simulation and Identification Elements	4	35	–	28	–
14	Discrete Event Systems	4	21	7	14	–
15	Microprocessor and Microcontroller Based Systems	4	28	–	14	14
16	Microeconomics	2	28	14	–	–
17	Sports 4	1	–	14	–	–
18	Applied Activities (45 hours)	2	–	–	–	–

Automation and Applied Informatics Specialization (AAI, 5 years)

Third Year of Study						
Nr. "xx"	Course Name (Code: "AAI-3-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Management	2	20	8	–	–
02	System Theory 2	5	42	–	28	–
03	Modeling and Simulation	4	28	–	21	7
04	Microprocessor Based Systems	5	28	–	28	–
05	Assembly Language	4	28	–	28	–
06	Operating Systems (opt.)	4	28	–	21	–
07	Introduction to Process Automation (opt.)	4	28	–	21	–
08	Computer Added Design of Complex Logical Circuits (opt.)	4	28	–	21	–
09	Programmable Logic Controllers (opt.)	4	28	–	21	–
10	Applied Activities (45 hours)	2	–	–	–	–
11	Economics 1	3	28	14	–	–
12	Control Structures and Algorithms	4	28	–	28	–
13	System Identification	4	42	–	14	–
14	Multiprocessor Systems	5	28	–	14	14
15	Data Security Techniques	4	28	–	28	–
16	Databases (opt.)	4	28	–	21	–
17	Microcontrollers (opt.)	4	28	–	21	–
18	Data Communications (opt.)	4	28	–	21	–
19	Electrical Actuators (opt.)	4	28	–	21	–
20	Control Systems for Continuous Processes (opt.)	4	28	–	21	–
21	Applied Activities (45 hours)	2	–	–	–	–

Fourth Year of Study						
Nr. "xx"	Course Name (Code: "AAI-4-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Finances of Trading Companies	2	20	8	–	–
02	Control Engineering	5	42	–	14	14
03	Computer Networks	5	28	–	28	7
04	Knowledge Based Systems	4	28	–	28	–
05	Electric Drives and Converters (opt.)	4	28	–	21	–
06	Fuzzy Control Systems (opt.)	4	28	–	21	–
07	Internet Applications Programming (opt.)	4	28	–	21	–
08	Advanced Computer Architectures (opt.)	4	28	–	21	–
09	Fuzzy and Neural Systems (opt.)	4	28	–	21	–
10	Design WEB and XML Techniques (opt.)	4	28	–	21	–
11	Applied Activities (45 hours)	2	–	–	–	–
12	Marketing	2	14	14	–	–
13	Advanced Control Strategies	4	28	–	28	–
14	Concurrent Programming	5	28	–	14	14
15	Artificial Intelligence	5	28	–	14	14
16	Computer Aided Manufacturing (opt.)	4	28	–	28	–
17	Computer-Aided System Optimization (opt.)	4	28	–	14	14
18	Signal Processing in Control (opt.)	4	28	–	14	14
19	Medical Informatics (opt.)	4	28	–	14	14
20	Biological Systems (opt.)	4	28	–	14	14
21	Medical Applications Programming (opt.)	4	28	–	14	14
22	Programming Environments (opt.)	4	28	–	14	14
23	Languages for Artificial Intelligence (opt.)	4	28	–	14	14

Nr. "xx"	Course Name (Code: "AAI-4-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
24	Computer Graphics (opt.)	4	28	–	28	–
25	Networks With Integrated Services (opt.)	4	28	–	14	14
26	Intranet Networks (opt.)	4	28	–	14	14
27	Distributed Systems for Data Acquisition and Control (opt.)	4	28	–	14	–
28	Communication Skills (facult.)	2	14	28	–	–
29	Applied Activities (45 hours)	2	–	–	–	–

Fifth Year of Study						
Nr. "xx"	Course Name (Code: "AAI-5-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Equipments for Motion Control (opt.)	5	28	–	28	14
02	Control Systems Based on Microprocessor Equipments (opt.)	5	42	–	14	14
03	Control of Electrical Drives (opt.)	5	28	–	28	–
04	Non-Electrical Actuators (opt.)	5	28	–	28	–
05	Complex Automation (opt.)	5	28	–	28	14
06	Advanced Control Systems (opt.)	5	28	–	28	14
07	Norms, Standards and Quality Guarantee (opt.)	5	35	14	–	7
08	Measurement Systems in Process Control (opt.)	5	28	–	28	–
09	Windows Programming (opt.)	5	28	–	28	14
10	Software Engineering (opt.)	5	28	–	28	–
11	E-Commerce (opt.)	5	42	–	28	–
12	Interactive Simulation Tools (opt.)	5	28	–	14	14
13	Telemedicine (opt.)	5	28	–	28	14
14	Software Design Management in Health Informatics (opt.)	5	28	–	28	–
15	Expert Systems in Medicine (opt.)	5	42	–	14	14
16	Biomedical Engineering (opt.)	5	28	–	28	–
17	Introduction to Robot Control (opt.)	5	28	–	28	14
18	Machine-Tool Control (opt.)	5	28	–	28	–
19	Control Systems for Servo-Drives (opt.)	5	28	–	28	14
20	The Management of Flexible Manufacturing Systems (opt.)	5	28	–	28	–
21	Java Programming (opt.)	5	28	–	28	–
22	Image Processing (opt.)	5	28	–	28	–
23	Real Time Operating Systems (opt.)	5	28	–	28	14
24	Signal Processing (opt.)	5	28	–	28	14
25	Database Programming Technologies (opt.)	5	28	–	28	–
26	CASE Tools (opt.)	5	28	–	14	14
27	Process Automation in Flexible Manufacturing Structures (opt.)	5	28	–	28	–
28	Virtual Instrumentation in Control (opt.)	5	28	–	14	14
29	Communication Skills (facult.)	2	14	28	–	–
30	Diploma Project (proj.)	30	–	–	–	168

Master Specialization: Automatic Systems (AS, 2 years)

First Year of Study						
Nr. "xx"	Course Name (Code: "AS-1-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Complements of Systems Theory and Quality Engineering 1	6	14	-	-	-
02	Modern Control Theory 1	6	14	-	-	14
03	Artificial Intelligence and Knowledge Engineering	6	28	-	-	14
04	Neural Networks	12	56	-	-	28
05	Complements of Systems Theory and Quality Engineering 2	8	14	14	-	14
06	Modern Control Theory 2	7	28	-	-	14
07	Adaptive Control Systems	7	28	-	-	14
08	Genetic Algorithms	8	28	-	-	14
09	Dissertation Thesis (proj.)	10	-	-	-	168

3.2.A.2 Syllabus of the Courses Taught by the Department Staff

First Year of Study (SE)

SE-1-03: Computer Programming (Prof.Dr.Eng. L cr mioara STOICU TIVADAR)

Objective: Study of fundamentals of programming, computer science and information technology.
Contents: general presentation of computers (hardware, software, software engineering, applied informatics), fundamentals of computer networks, Internet, WWW, basics of C language (structure of a program, variables, constants), expressions, operators, standard types, standard functions, statements (compound, association, selection, iteration), functions, pointers, structured types (arrays, string, structures), files, lists, programming style, dynamic allocation of memory.

SE-1-06: Standards and Technical Graphics (Assoc.Prof.Dr.Eng. Constantin VOLO ENCU)

Course contents: Romanian standards, Standards oriented to process quality, Quality technical conditions of the automatic equipment, Quality technical conditions for software, Reference model for computer graphics, The technical book of a product, The professional standard of a product, Design documentation, Innovations and intellectual property, Ways of information, Application of technical graphic in electronics and mechanics.

SE-1-11: Computer Assisted Mathematics (Prof.Dr.Eng. Radu-Emil PRECUP)

Course contents: Notions of error theory; elements of numerical matrix calculus; numerical solving of linear algebraic equations; numerical computation of eigenvalues and eigenvectors; numerical solving of nonlinear algebraic equations and systems; approximation of functions, curves and surfaces; numerical solving of ordinary differential equations and systems; optimization problems in automation and informatics.

SE-1-12: Data Structures and Algorithms (Lect.Dr.Eng. Dorina PETRIC)

Course contents: Fundamental concepts of data structures and structured programming; Fundamental data types and structured data types; Notions about algorithms; Algorithm analysis with asymptotic notations; Sorting techniques (direct and advanced, internal and external); Analysis of sorting algorithms; Arrays as abstract data types (implementation, searching techniques); Recursion; Lists (definition of the abstract data type list, implementation techniques, applications); Special lists (stacks, queues); Multi-list structure; Generalized lists; Trees (definition of the abstract data type tree, traversal of trees, specific operators); Binary and ordered trees.

SE-1-14: Electronic Devices and Circuits (T.Assist.Eng. Radu BORACI)

The aim of the course is to provide grounding in classical methods of analysis and design of analogical, discrete and integrated electronic circuits. Discrete and integrated analog devices (structure, operation, characteristics, maximum admissible values, application). Course contents: Diodes; Bipolar transistors; Thermo-sensible devices, optic elements; Field effect transistors (JFET, MOSFET); Thiristors; Triacs; Operational integrated amplifiers (types, main applications in automatics); Voltage sources; Electronic circuits (operation analysis, synthesis); Application of electronic devices in automatics.

SE-1-15: Computers Fundamentals (T.Assist.Eng. Onu LUNGU)

Offer basic knowledge in design with numerical devices to first year students. Main study areas are logical functions and various methods to minimize their formulas with practical applications on several digital systems starting from simple logical gates, multiplexers, decoders, different kinds of bi-stable

circuits RS, D, JK, T ending with applications of those, counters, registers and synthesis of sequential circuits in both forms synchronous and asynchronous. Objectives of the course are to offer to the students basic understand of how numerical devices are working and ways to improve their functionality making them cost effective.

Second Year of Study (SE)

SE-2-01: System Theory 1 (Prof.Dr.Eng. Toma Leonida DRAGOMIR)

The objectives of the course are: Assimilation of terminology and basic systemic concepts; Knowledge of main models of linear, non-linear, continuous and discrete time systems; Assimilation of characterization elements of systems in time and complex frequency domains; Using of stability, controllability and observability analysis techniques for linear systems. The competencies created by the course are: Generating interpretation, design and research skills by using knowledge from other fundamental courses for modeling and analysis of physical systems.

SE-2-03: Object-oriented programming (Prof.Dr.Eng. Vasile STOICU-TIVADAR)

Objectives: to provide knowledge and skills about the development of medium-level complexity programs in C++, including templates, basics about Windows programming. Content: Object-oriented paradigm, general aspects of the C++ language, classes and objects, matrix, pointers, references, overloading, inheritance, polymorphism with virtual functions, input/output operations, introduction in Windows programming, templates.

SE-2-04: Introduction in Automation (Prof.Dr.Eng. Stefan PREITL)

The objectives of the course are: Process automation. Automatic control structures. Automation functions: command, control, supervision and safe functioning. Structure and realization of Automatic Control Equipments (*ACE*). Requirements for automatic control. Approach of an automation task. Industrial processes (plants). Disturbances. Mathematical description. Actuators, transducers and sensors. Control strategies and technical aspects of implementation. Implementation requirements. Examples for automatic control solutions in industrial and non-industrial area. Case studies.

SE-2-05: Digital Circuit Design (Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU)

Digital Circuit Design with VHDL, high-level functional hardware-description-language based on examples; Code structure: library, entity, architecture; Test bench; Data types; Operators and Attributes, overloading, generic; Concurrent code: when, generate, block; Sequential code: process, if, wait, case, loop - comparisons; Signal and variable; State machines: clock, edge detections, template styles; Hierarchical system design: package, component, port

map, generic map; Functions and Procedures, assert; Study cases, applications; Problems: solved and proposed.

SE-2-06: Computer Architecture (Prof.Dr.Eng. Nicolae ROBU)

Overview on computer architecture; the place and the role of software and hardware architectural components and their interactions. Memories: RAM, ROM, PROM, EPROM, EEPROM –definition and units design. Ports: standard input port and standard output port. Numbers representation inside the computer: fixed point and floating point (IEEE 754) approach. Arithmetical-Logical Unit: adding devices, multiplying devices, dividing devices. The registry unit: case studies on CSAC 2001, MOTOROLA 68 0x0 and INTEL 80x86 processors, including the stack concept's implementation and presentation. The command unit: the von Neumann paradigm and the architectural components of a von Neumann command unit, with a case study on CSAC 2001 processor; instructions' coding -including addressing modes problems; instructions' implementation, with illustration for LD, JP, ADD, CALL, RET, PUSH, POP, IN and OUT instructions. The advanced functionalities of the processors: the waiting mechanism, the bus giving up mechanism, the interruption mechanism (with vectored and non-vectored interruptions).

SE-2-10 System Theory 2 (Prof.Dr.Eng. Toma-Leonida DRAGOMIR):

The objectives of the course are: Knowledge and using of terminology and basic concepts regarding non-linear systems; Knowledge and handling of stability analysis techniques for non-linear systems. The competencies created by the course are: Generating interpretation, design and research skills for physical systems described by nonlinear models, and analyzing of some problems regarding the structure of control systems.

SE-2-11: Database (Assoc.Prof.Dr.Eng. Ioan FILIP)

The objectives of the course are: Relational Database Management Systems (RDBMS), Oracle database, SQL (all basic SQL commands: SELECT, INSERT, UPDATE, DELETE; create and manage tables and views, Oracle functions), PL/SQL language (PL/SQL blocks, functions, stored procedures, triggers, cursors, sequences, users packages, built-in packages, SQL dynamic, object programming), parallel with other RDBMS (MySQL, Interbase, Microsoft SQL Server).

SE-2-12: Concurrent Programming (Prof.Dr.Eng. Nicolae ROBU)

In its first part, the course emphasizes the type of applications opportune in concurrent programming and present the basic notions of this field (i.e. process, task, thread, multitasking, multithreading, multitasking with multithreading). It continues with tasks states presentation and tasks' evolution in states

space. Follow context switching and task scheduling – concepts and implementations. The last three parts are dedicated to the mutual exclusion, synchronization and communication problems and their afferent classical mechanisms, from practical and theoretical point of view alike approached.

SE-2-13: Modeling, Simulation and Identification Elements (Prof.Dr.Eng. Octavian PRO TEAN):

The objectives of the course are to provide knowledge and skills about modeling, simulation techniques of dynamic systems and the introduction to system's experimental identification problems. The most important deterministic and stochastic types of input signals are presented and respectively linear models, analytical model building approach, problems of continuous/discrete linear/non linear mathematical models simulation with the aid of the digital computer and analog circuits. In the last part of the course presents introductory elements regarding the system's experimental identification, graphic, parametric identification techniques from input step response for non perturbed systems and the model's conversions methods. There are created practical skills regarding the usage of Matlab/Simulink simulation software package.

SE-2-14 Discrete Event Systems (Prof.Dr.Eng. Octavian PRO TEAN)

The main objective of the course is to provide the knowledge and skills required for the model building and behavior's analysis of the discrete event driven systems (DES). There are approached fundamental concepts regarding the DES, models and techniques used in the study of DES and also aspects regarding the usage of Petri nets formalism in the DES's modeling and analysis. There are presented the characteristic properties of DES behavior, terminology and basic concepts in untimed Petri net formalism, typical structures used in Petri net modeling of DES, automata versus Petri net model building, case studies, analysis techniques for behavioral properties.

SE-2-15: Microprocessor and microcontroller based systems (Lect.Dr.Eng. Sorin NANU)

Continues the "Microprocessor architecture" discipline presenting the general use of microsystem resources both as external components for microprocessor and internal for microcontroller. Memory connections and access. Timers. Interrupt protocol. Serial communication (RS232, I2C, SPI). Parallel communication. Process interfaces: DAC and ADC, parallel port, PWM. Elements of data processing.

Third Year of Study (AAI)

AAI-3-02: System Theory 2 (Prof.Dr.Eng. Toma Leonida DRAGOMIR)

The objectives of the course are: Knowledge and using of terminology and basic concepts regarding

non-linear systems; Knowledge and handling of stability analysis techniques for non-linear systems.

The competencies created by the course are: Generating interpretation, design and research skills for physical systems described by nonlinear models, and analyzing of some problems regarding the structure of control systems.

AAI-3-03: Modeling and Simulation (Prof.Dr.Eng. Octavian PRO TEAN)

The contents of this course cover the problematic of the modeling and simulation of dynamical systems. The main objectives are the study of the most important deterministic and stochastic types of test signals and models, analytical model building approaches, problems of continuous/discrete, linear/non-linear mathematical models simulation with the aid of the digital computer and analog circuits. There are presented MATLAB-Simulink, SIMNON software packages.

AAI-3-04: Microprocessor Based Systems (T.Assist.Eng. Dan UNGUREANU)

The course focuses on microprocessor based systems. In the first part, the Intel 8086 microprocessor is presented in details, as the base element of the Intel family. The study of 8086 includes: internal structure and functional mode; bus cycles of the microprocessor; interrupts system; connection of memories to the microprocessor. The second part of the course studies a series of peripheral circuits such as the interrupt controller 8259A, the input-output parallel port 8255 and the circuit timer-counter 8254.

AAI-3-05: Assembly Language (Lect.Dr.Eng. Dorina PETRIC)

Course contents: Characteristics of the assembly language for the 8086 family and of the MASM assembler; Structure of the registers; Assembler directives; Variable definition; Addressing techniques; Format of the instructions; Definitions of segments (complete, simplified, initialization of the segment registers, ordering of the segments); Transfer instructions; Arithmetic and logic instructions; Array processing; Branch instructions (unconditional jump, conditional jump, instructions for cycling, the subroutine mechanism, interruptions); DOS functions; Input/ output operations; Macroinstructions and conditional assembly; Record data and structure data.

AAI-3-06: Operating Systems (Lect.Dr.Eng. Florin DR GAN)

An Operating System is the most widely used piece of software in any computer. At the end of this course the students will understand the various levels of system and application software. They will be familiar with the major Operating System services such as file systems, memory management, process management, device control and network services. They will understand how design decisions in Operating Systems affect users of the system.

AAI-3-07: Introduction to Process Automation (Prof.Dr.Eng. tefan PREITL)

Course contents: Process automation; Automatic control structures; Automation functions (command, control, supervision and safe functioning); Structure and realization of Automatic Control Equipments (ACE); Requirements for automatic control; Approach of an automation task; Industrial processes (plants); Disturbances; Mathematical description; Actuators, transducers and sensors; Control strategies and technical aspects of implementation; Implementation requirements; Examples for automatic control solutions in industrial and non-industrial area; Case studies.

AAI-3-08: Computer Added Design of Complex Logical Circuits (Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU)

Introduction in hardware design language VHDL, goal, utility, applications; CAD design environments: hardware design, implementation, simulation, automatic synthesis; Entity design, libraries; Sequential states; Types; Registers and synchronizations; Finite state machine; Particularizations and applications with FPGA and ASIC, manufacturers specifications; Course based on examples given in advances.

AAI-3-09: Programmable Logic Controllers (T.Assist.Eng. Onu LUNGU)

This course covers PLC programming, installations, and troubleshooting. Emphasis is placed on logical thinking and efficient, logical program development. Key concepts covered in the this PLC course include: Programming AND / OR conditions, Seal / Latch instructions, Examine ON / Examine OFF instructions, PLC program scan cycle, program documentation, batch programming techniques, understanding PLC addressing, common program problems and bugs, safety considerations, programming counters and timers, comparison statements, numerical / integer operations.

AAI-3-12: Control Structures and Algorithms (Prof.Dr.Eng. tefan PREITL)

Automatic control system structures. Objectives of automatic control. Criteria and performance indices: time domain, frequency domain, zeros-poles. Sensibility and robustness analysis. Conventional control algorithms (PI, PID) (continuously working and discrete time). Supplementary functions (limitation, AWR, parameter adaptation, algorithms changing). Implementation of control algorithms. Two positioning and three positioning algorithms. Steady state behavior of automatic control structures (ACS). ACS using artificial static coefficient. The functioning of ACS coupled through the output signal.

AAI-3-13: System Identification (Prof.Dr.Eng. Octavian PRO TEAN)

The aim of the course is to provide the knowledge necessary for the mathematical modeling and

parameter estimation of the systems from experimental data. There are presented classical methods of identification: impulse, step and sine-wave testing, identification techniques based on correlation function, the fundamental concepts and major results of parameter estimation theory, mean-square and minimum variance methods, predictor error methods, instrumental variable methods, and maximum likelihood methods - off-line and on-line way manner.

AAI-3-14: Multiprocessor Systems (Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU)

Multiprocessor structures: architectures, topologies, communication principles; MULTIBUS capability, specifications: Master-Multibus interface, Data address block, Dual port access RAM, Bus interrupts, Bus arbitration; Standard module architectures in multiprocessor applications; VMEbus: capability, specifications, particularities; P896-bus: particularities; Distributed bus arbitration with priority self-selection; Slave module; Coupling of parallel external buses - BusWindows; IEEE 488-bus: specifications and application area. Lab. applications using VHDL.

AAI-3-15: Data Security Techniques (Prof.Dr.Eng. Daniel Ioan CURIAC)

The main focus of the course is to provide background knowledge on the field of cryptography and its applications to secure networking and electronic commerce since most of today's information technology applications require security as a central system feature. Topics include and are not limited to cryptographic primitives and protocols, key management and access control and network security. Lectures will include basic techniques to provide security, information on the current state of the art and further reading on more advanced topics.

AAI-3-16: Databases (Assoc.Prof.Dr.Eng. Ioan FILIP)

The objectives of the course are: Relational Database Management Systems (RDBMS), Oracle database, SQL (all basic SQL commands: SELECT, INSERT, UPDATE, DELETE; create and manage tables and views, Oracle functions), PL/SQL language (PL/SQL blocks, functions, stored procedures, triggers, cursors, sequences, users packages, built-in packages, SQL dynamic, object programming), parallel with other RDBMS (MySQL, Interbase, Microsoft SQL Server).

AAI-3-17: Microcontrollers (T.Assist.Eng. Dan UNGUREANU)

The course creates capacities in the microcontroller field. In the first part of the course, the Intel MCS51 family is studied: internal structure, the instructions set, addressing modes, hardware structure of the 8051 microcontroller based systems, the interrupts system, the timer/counter system, the serial communication system. In the second part, the Motorola HC11 family is studied: internal structure, the instructions set, addressing modes, hardware structure of the 68HC11-

based systems, the interrupts system, the timer/counter system, the system of serial communication.

AAI-3-18: Data Communication (T.Assist.Eng. Cezar POPESCU)

Basic concepts. The infrastructure of communications. The Public Switched Telephone Network. Data terminals and data interfaces. The structure of a data communication system. The RS232 interface. Modulation in data transmission. The modem equipment. Information coding. Primary coding. Channel coding. Communication channels: cables, optic fibers, radio waves, satellite communications. GSM cellular telephony. New standards in cellular communication. Data networks with integrated services.

AAI-3-20: Control Systems for Continuous Processes (Assoc.Prof.Dr.Eng. Constantin VOLO ENCU)

Symbols used in control system diagrams. Unified control systems. Level control systems. Flow control systems. Temperature control systems. Pressure control systems. Modeling of control systems for industrial processes. Sensors for process control. Actuators for process control. Applications. Introduction in LabView. Virtual instruments. Virtual level control. Virtual temperature control. Virtual pressure control.

Fourth Year of Study (AAI)

AAI-4-02: Control Engineering (Prof.Dr.Eng. tefan PREITL)

Course contents: Requirements for automatic control structures design; Classical design methods using PI and PID controllers (zero-pole mapping, frequency domain (Nyquist, Bode), pre-calculated diagrams and tuning relations, optimization criteria); Examples and case studies of different classes of systems (fast and slow plants); The Reswick compensator; Automatic control systems (ACS) based on disturbance compensation; Cascade ACS; State feedback ACS; State estimators; Direct design of numerical ACS; Design of two-degrees-of-freedom control structures; Introduction to predictive control; Introduction to multivariable control system design.

AAI-4-03: Computer Networks (Assoc.Prof. Dr.Eng. Ioan SILEA)

Goals: Presentation of the main local networks structures, equipment and problems involved in computer networks; Assimilation of the client-server model principles; Getting the notions regarding administration, access and safety in networks. Abilities created: Knowing the hardware components of a local network and the wiring principles; Knowing the structure of the network data packages and some data control and congestion avoidance methods; Knowing the steps concerning a computer installation in a network; Competences regarding the user

accounts administration; Achievement of a client-server application; Networks extension.

AAI-4-04: Knowledge Based Systems (Prof.Dr.Eng. Daniel Ioan CURIAC)

This course covers the underlying technologies, and the planning and implementation of knowledge based systems. It covers issues of knowledge representation and the corresponding inference engines, providing practical experience in the design and implementation of knowledge-based systems. It discusses the integration of knowledge-based systems with the operating environment and different kinds of applications.

AAI-4-05: Electrical Drives and Converters (Lect.Dr.Eng. Sorin MU UROI)

The course presents driving systems, emphasizing their basic element - the electric converter, embodied with power electronics components. It also deals with complex control – systems for AC motors fed by static frequency-converters. The converter-motor-control circuits' system is studied by means of unitary space phasors theory. Thus the method presented is compatible with dynamic performances, required by the control-systems.

AAI-4-06: Fuzzy Control Systems (Prof.Dr.Eng. Radu-Emil PRECUP)

Elements of fuzzy set theory and fuzzy logic, notions concerning fuzzy sets, connectors and operators associated to fuzzy sets; information processing in terms of fuzzy logic; basic fuzzy controller (FC) structure and analysis; typical and special FCs, FCs without dynamics, FCs with dynamics, Takagi-Sugeno FCs; PI-fuzzy controllers, conventional controllers with parameter adaptation in terms of fuzzy logic; fuzzy control structures and design; applications of fuzzy control.

AAI-4-07: Internet Applications Programming (Assoc.Prof.Dr.Eng. Ioan FILIP)

The course presents basic and advanced elements regarding the HTML language used to develop Web applications. Also, there are presented techniques of Web development applications using the PHP language. The topic is focused on database Web applications, including also the Microsoft technology Internet Database Connector.

AAI-4-08: Advanced Computer Architectures (T.Assist.Eng. Cezar POPESCU)

A structured approach on computer architectures. Cache memories. Functional principles and implementation examples. Memory management. Segmentation and pagination. The concepts of virtual memory and virtual machine. Classical 32 bit microprocessors. Architecture and programming models for the Motorola 68x00 and Intel 80x86 series. RISC processors. Functional principles. The elements of a RISC core. Compile time optimizations. Superscalar processors. The PowerPC 640

microprocessor. 80x86 compatible processors. The PowerPC 555 microcontroller.

AAI-4-09: Fuzzy and Neural Systems (Assoc.Prof.Dr.Eng. Constantin VOLO ENCU)

Fuzzy logic. Generalities. Fuzzy sets. Fuzification. Inference. Defuzification. Input-output characteristics of the fuzzy systems. Fuzzy PID controllers. PI fuzzy controllers. PD fuzzy controller. PID fuzzy controller. Fuzzy control systems. Neural networks. The neuron. Feed-forward neural networks. Back propagation. Other training methods. Neural control. Neural identification. Neural control structures.

AAI-4-10: Design WEB and XML Techniques (Lect.Dr.Eng. Florin DR GAN)

The course has two components. One of them is the design web one and includes some design web techniques regarding images, colors, etc. The primary focus of the XML part is the practical implementation of XML in real businesses, drawing on our experience implementing XML-based solutions on complex, high-traffic, e-commerce style web sites. It provide both a strategic overview of XML (its structure and its applications in business) and a technical introduction to its application.

AAI-4-13: Advanced Control Strategies (Prof.Dr.Eng. Radu-Emil PRECUP)

Sliding mode control systems with commutation based on control error and state-feedback; elements of fuzzy set theory and fuzzy logic; adaptive hybrid neuro-fuzzy control strategies, basic model of a neuron, single layer perceptron, multiple layer perceptron artificial neural networks, standard version of PI-fuzzy controller, adaptive hybrid neuro-fuzzy control structures; elements of control system optimization.

AAI-4-14: Concurrent Programming (Prof.Dr.Eng. Nicolae ROBU)

In its first part, the course emphasizes the type of applications opportune in concurrent programming and present the basic notions of this field (i.e. process, task, thread, multitasking, multithreading, multitasking with multithreading). It continues with tasks states presentation and tasks' evolution in states space. Follows context switching and task scheduling – concepts and implementations. The last three parts are dedicated to the mutual exclusion, synchronization and communication problems and their afferent classical mechanisms, from practical and theoretical point of view alike approached.

AAI-4-15: Artificial Intelligence (Lect.Dr.Eng. Dorina PETRIC)

Categories of applications tackled by artificial intelligence. Principles of knowledge-based approaches. Representation of knowledge. Problem solving. Searching techniques (depth, level, the evaluation of the search). Heuristic search techniques (maximum effort, low costs). Searching for multiple solutions and for the optimal solution. The processing of the natural language. Artificial vision and forms

recognition. Recognition of the 2D forms. Creating a program for a robot simulation (characteristics, specifications, the editor, teaching the robot, the use of the robot).

AAI-4-16: Computer Aided Manufacturing (T.Assist.Eng. Cristian VA AR)

The course presents the general control structure for computer aided manufacturing systems, flexible manufacturing systems modeling based on Petri nets, ISO GM Code for CNC programming, WALLI software (Workcell Amalgamated Logical Linguistic Instructions). Several manufacturing applications will be implemented on the existing workcell.

AAI-4-17: Computer-Aided System Optimization (Prof.Dr.Eng. Radu-Emil PRECUP)

Definition of an optimization problem (OP); one-step OPs including no constraint OPs, OPs with equality/inequality constraints, parametric OPs of dynamic regimes corresponding to continuous- and discrete-time linear systems; discrete-time optimization problems, discrete Euler-Lagrange equations, discrete-time optimal control problems, discrete-time minimum principle for optimal control problems, discrete-time dynamic programming, discrete-time linear-quadratic regulator problem.

AAI-4-18: Signal Processing in Control (Lect.Dr.Eng. Sorin NANU)

Signal and system concepts. Digital processing - acquisition, conversion. Convolution , correlation. Discrete Fourier Transform (DFT), Fast Fourier Transform (FFT). Spectrum. Filtering – analogue and digital filtering. Filters in digital equipments for process control technology. Digital equipments for signal processing.

AAI-4-19: Medical Informatics (Prof.Dr.Eng. L cr mioara STOICU TIVADAR)

Objective: Study of informatics systems applied in healthcare (design, functions, use). Contents: Informatics systems applied in healthcare, standards, codes, classification, dedicated informatics systems for: general practitioners, hospitals, laboratories; design of interfaces, client centered applications.

AAI-4-20: Biological Systems (Prof.Dr.Eng. L cr mioara STOICU TIVADAR)

Objective: Study of the anatomical structure and the physiology of the human body systems. Contents: Biological systems of the human body, nervous system, memory, cardiac instrumentation, ECG, ECG mapping, senses, genetics, immunity.

AAI-4-21: Medical Applications Programming (Prof.Dr.Eng. Vasile STOICU-TIVADAR)

Objective: to provide knowledge and practical skills about development of medium complexity applications in Visual Basic environment, and basics in Visual C. Content: The Visual Basic environment, user interface design, usual controls, graphics and databases in Visual Basic, special topics (client-server,

Internet), Windows mechanisms, the Visual C environment, user interface design, usual classes in MFC, mobile applications on PocketPC developed with Embedded Visual Basic, improvements in Visual Studio.NET.

AAI-4-22: Programming Environments (Prof.Dr.Eng. Vasile STOICU-TIVADAR)

Objective: to provide knowledge and practical skills about development of medium and high complexity applications in Visual Basic environment

Content: The Visual Basic environment, user interface design, usual controls, graphics and databases in Visual Basic, special topics (client-server, Internet, API functions, files, the use of Registry), mobile applications on PocketPC with Embedded Visual Basic, improvements in Visual Basic.NET.

AAI-4-23: Languages for Artificial Intelligence (Lect.Dr.Eng. Dorina POPESCU)

Objective: Study of the characteristics of the languages used in artificial intelligence applications and programming in Prolog. Contents: Artificial intelligence, knowledge bases, programming in Prolog - data, variables, sentences, structures, files, data bases, external data bases, trees, lists, search methods, expert systems.

AAI-4-24: Computer Graphics (Prof.Dr.Eng. Daniel Ioan CURIAC)

This course covers computer graphics fundamentals. The graphics pipeline; affine transformations; clipping; scan conversion algorithms; hidden object detection; illumination and shading models; color concepts; graphics APIs and hardware. At the labs the students design and programming a complete graphic system with rendering and different objects.

AAI-4-25: Networks with Integrated Services (Assoc.Prof.Dr.Eng. Ioan SILEA)

Goals: Knowing the structure of a network with integrated services; The model and design of an ATM network; Main features of industrial networks (connectivity, flexibility, robust, mobility, promptitude, configurability); Assimilation of some notions about virtual networks (VPN). Abilities created through this discipline: Implementation of specific protocols in the network; Achievement of distributed applications structures; Theoretical knowledge concerning present orientations in networks; The principles and necessary equipment for building a virtual network for a firm; Introductory notions, necessary for TCP/IP applications.

AAI-4-26: Intranet Networks (Lect.Dr.Eng. Florin DR GAN)

This course is focused on the intranet networks devices and programming. We provide for the students detailed information regarding different network devices, DNS system and Perl language for programming network applications. The course insist on the devices like hub, bridge, gateway, router and at

the labs to implement application in Perl programming.

AAI-4-27: Distributed Systems for Data Acquisition and Control (T.Assist.Eng. Tiberiu-D nu IONIC)

The structure and general properties for a data acquisition system: transducer and sensors (temperature transducer), Signal conditioning modules, Data acquisition modules and software. System for Data acquisition and Control with National Instruments modules. System for Data acquisition and Control with GPIB interfaces. The structure and functionality for an industrial network (with three layers: physical, data link and application, ISO-OSI standard). Examples for industrial network: CAN (Controller Area Network) and AS-I (Actuator/sensor Interface).

Fifth Year of Study (AAI)

AAI-5-01: Equipments for Motion Control (Lect.Dr.Eng. Sorin NANU)

Microcontroller in control of DC Motor. Chopper, controlled rectifier. Encoder, tacho-generator. Speed and position control for DC motor. Stepper motors, type, structures for controlling speed and direction. Control in open and closed loop.

AAI-5-02: Control Systems Based on Microprocessor Equipments (Lect.Dr.Eng. Dorina POPESCU)

Goal: To show why microprocessor equipments can be used to implement PID controllers. To show how to implement (hardware and software) a digital control algorithm. Contents: Technical factors and business aspects in choosing a bus for control systems. Description of measurement and control SBC, digital and analog input/output boards. Using SBC for measuring and control. System configuration. Microprocessor equipments processing capabilities: multiple control loops. Implementation using digital techniques: analog signal digitization, high frequency aliasing error, low pass filter algorithm, etc.

AAI-5-03: Control of Electrical Drives (Assoc.Prof.Dr.Eng. Constantin VOLO ENCU)

Topology of the electrical drives. Control of DC motors. Vector control of induction motors. Vector control of permanent magnet synchronous motors. Advanced control systems for electrical drives. Modeling and simulation of control systems for electrical drives and DC motors. Modeling and simulation of a vector control system for induction motor and for permanent magnet synchronous DC motors. Digital control system for a permanent magnet synchronous system, based on a digital signal processor and based on a ASIC for motion control.

AAI-5-05: Complex Automation (Prof.Dr.Eng. Octavian PRO TEAN)

The aim of the course is to provide grounding in the concepts, the main aspects of modeling, analysis and

design methods of some special system's categories, such as: Large Scale Systems, Systems with Distributed Parameters, Robust Systems, Variable Structure Control Systems and Hierarchical Systems. There are presented examples and representative study cases regarding each type of studied system.

AAI-5-06: Advanced Control Systems (Prof.Dr.Eng. Radu-Emil PRECUP)

Definition of model-based predictive control problem; models and predictors; integral quadratic objective functions; development of unified predictive control law; predictive control of multivariable plants; structures and development of binary control systems; aspects concerning auto-tuning control systems; applications to time-delay and MIMO systems.

AAI-5-07: Norms, Standards and Quality Guarantee (Assoc.Prof.Dr.Eng. Constantin VOLO ENCU)

Romanian standards. Quality system. Technical conditions for automatic installations. Technical documentation. Standards for graphics on the computers. The technical book of a product. The professional standard. Design documentations. Norms for working protection. Phases of the product development. Inventics and intellectual property. Ways of information.

AAI-5-08: Measurement Systems in Process Control (Lect.Dr.Eng. Sorin NANU)

Principles of measure in process control. Data acquisition, signal conditioning, signal conversion, ADCs, programmable potentiometers, analogue multiplexers. Isolation, protection. Data transmission, noise, correctness of information. Study by examples of position (potentiometric, encoder), speed (potentiometric), rotational speed (encoder, tachogenerator), temperature (PT100, intelligent TMP37), N-S orientation (electronic compass), distance (SONAR) measurement.

AAI-5-09: Windows Programming (Prof.Dr.Eng. Vasile STOICU-TIVADAR)

Objective: to provide knowledge and practical skills about development of medium complexity applications in Visual C environment.

Content: Windows mechanisms, the Visual C environment, user interface design, usual classes in MFC, templates, Document-View architecture, graphics and databases, in Visual C, mobile applications on PocketPC developed with Embedded Visual C, improvements in Visual C.NET.

AAI-5-10: Software Engineering (Prof.Dr.Eng. Vasile STOICU-TIVADAR)

Objective: to provide knowledge and practical skills about software development life cycle, objectives, principles and techniques, with emphasis on real-time systems and object-oriented technologies. Content: Definition, objectives and principles, the software life cycle, software development, configuration management, software for process control, real-time

software design with MASCOT method, operating systems for general use and for real-time systems, safety, testing, real-time UML, issuing process control software and systems.

AAI-5-11: E-Commerce (Prof.Dr.Eng Daniel Ioan CURIAC)

The main focus of the course are the e-commerce techniques and to provide an understanding of the major forces shaping electronic commerce, tools for thinking through the economics of change in industries and supply chains, an understanding of the challenges of change in large, established companies and habits of orderly, analytical thinking and skill in reporting conclusions.

AAI-5-12: Interactive Simulation Tools (Assoc.Prof.Dr.Eng. Ioan FILIP)

There are presented basic knowledge about the modeling and simulation of discrete-event system. The examples are implemented using the GPSS language. GPSS, the General Purpose Simulation System, is a family of mostly-declarative languages designed for discrete-event simulation and system modeling. GPSS block types including generators, queues, selectors/routers, data collectors, timing and computational nodes, etc. are describes.

AAI-5-13: Telemedicine (Prof.Dr.Eng. L cr mioara STOICU TIVADAR)

Objectives: Study of the integration and communication between healthcare systems, data transmission, remote access to medical information. Contents: Communication, distributed information systems (client/server, peer-to-peer), video-conferences, medical data accessed from remote locations, medical distance education, medical services on the Web, security, integrity, privacy of data, DICOM & HL7 standards, telepathology, teleradiology, telecardiology, telemedicine for general practitioners, mobile applications in healthcare.

AAI-5-14: Software Design Management in Health Informatics (Prof.Dr.Eng. Vasile STOICU TIVADAR)

Objective: to provide knowledge and practical skills about software development life cycle, objectives, principles and techniques, with emphasis on Health Informatics and real-time systems and object-oriented technologies. Content: Definition, objectives and principles, the software life cycle, software development, configuration management, software for health Informatics (examples), real-time software design with MASCOT method, operating systems for general use and for real-time systems, safety, testing, real-time UML, issuing Health Information systems.

AAI-5-15: Expert Systems in Medicine (Lect.De.Eng. Dorina PETRIC)

Expert systems (definitions, general characterization, structural definition elements, performances). Development methodology of the expert systems. The formalism of the expert systems. Analysis of

inferential processes in rules based expert systems based. The medical diagnosis process. Definition of the associated models of the realization of a medical expert system (verbal model, conceptual model, logic model, functional model). Example- expert system for the diagnosis of the isolated paralysis of the exterior eye muscles. The synthesis of some implementation variants of medical expert systems.

AAI-5-17: Introduction to Robot Control (Prof.Dr.Eng Gheorghe-Daniel ANDREESCU)

Industrial robot generation types; Geometrical and kinematical models; Trajectory generation, 2D orthogonal interpolation algorithm, applications; Control structure for 1 axis module, robust control; Advanced control: model reference, dynamic, force control; Main tasks – software structure; Case study: Hierarchical control for a point to point robot with 6 degrees of freedom using microcontroller multiprocessor system; Sensors, specific transducers; Observers for kinematical signals and equivalent load torque; Specific hardware interfaces, multiprocessor architectures.

AAI-5-18: Machine-Tool Control (T.Assist.Eng. Tiberiu-D nu IONIC)

Measure system for machine-tool: Numerical incremental and absolute transducer, Analogical transducer. C.N.C equipment control. Hardware, software, interpolation algorithms. ISO programming for C.N.C equipment: Circular and linear interpolation, Absolute or incremental programming Tool radius compensation, Subprogram with repeat facility, Q parameter programming, Mirror imaging.

AAI-5-19: Control Systems for Servo-Drives (Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU)

Requirements, specific applications for servo-drives; Orthogonal models for electrical machines, Voltage source inverter; Permanent magnet synchronous motor and Induction motor drives; Experimental identifications of parameters; Vector controls: decoupling current control, field oriented control, direct torque control; Observers for flux, electromagnetic torque, kinematical signals and equivalent load torque; Motion control with: PI, state feedback, sliding-mode; Implementations using microcontroller, DSP: applications, interfaces, programming.

AAI-5-20: The Management of Flexible Manufacturing Systems (Lect.Dr.Eng. Antonius STANCIU)

The course offers an up to date vision over the manufacturing processes: hierarchical levels of flexible manufacturing structures, industrial solutions for networks in computer driving of flexible manufacturing structures (BRING solution, MODIAC solution, TELWAY solution, ETHERNET solution). Modeling using PETRI network is presented for some specific situation.

AAI-5-21: Java Programming (Prof.Dr.Eng. Nicolae ROBU)

In the first part, the course presents the Java philosophy, the different types of Java programs: standard applications, applets, beans, servlets, aglets, and handlers and the components of JDK programming environment. It continues with the presentation of Java alphabet, constants, types, instructions and elementary program structure. Follow Java object oriented approach, then the arrays and the exceptions. An important part is dedicated to the threads' problems and methods of synchronization used in concurrent programming in Java. The last part treats the Java facilities for graphical interfaces design, of coarse event oriented. Inclusive the applets development problems is approached.

AAI-5-22: Image Processing (T.Assist.Eng. Cezar POPESCU)

The human eye. Models for gray level and color images. The acquisition and transmission of images. The standard video signal. The geometry of images. Elementary transformations. The perspective transformation. Stereoscopic vision. Image analysis in the special frequency domain. The bidimensional Fourier transform. Filters in the transformed domain. Image enhancement. Histogram modification techniques. Spatial masks based filters. Image segmentation and contour identification. Region based segmentation.

AAI-5-23: Real Time Operating Systems (T.Assist.Eng. Dan UNGUREANU)

The course creates capacities in the field of real time systems. The course presents the base elements of a real time operating system with direct exemplification of RTOS QNX. It follows: the presentation of structure and role of the microkernel; the inter-process communication with all its variants (message passing, proxy, signals); the presentation of the managing mode of timers; the presentation of the communication mode in network; the presentation of the managing mode of interrupts; the presentation of managing mode of files.

AAI-5-24: Digital Signal Processors (T.Assist.Eng. Tiberiu IONIC)

The structure and general properties for a Digital Signal Processor. TMS320C3x floating-point processor. Internal architecture, design description, hardware components, device operation. TMS320C240 fixed-point processor. Functional block architecture, memory organization and registers, pipeline mode of operation. Event Manager with general purpose timers, capture and compare units. Peripheral Interface with dual analog/numeric converter, serial interfaces (UART and SPI) and watchdog timer.

AAI-5-25: Database Programming Technologies (Assoc.Prof.Dr.Eng. Ioan FILIP)

Programming technologies used to develop database applications (client side programming): ODBC, ADO, ADO.NET. Database applications development using ADO.NET library and C# language. Delphi database programming based on ODBC and ADO techniques (using Data Access, Data Control, ADO, QReport libraries). Client-server and local database.

AAI-5-26: CASE Tools (Assoc.Prof.Dr.Eng. Ioan FILIP)

The course presents basic issues of software engineering and a set of software tools used to manage the configuration of the software projects, project versioning, fault reports management, automated testing: Clearcase, CVS - Concurrent Versioning System, WinRunner, ARTS. Also there are presented the formal language SDL and the related tool GEODE.

AAI-5-27: Process Automation in Flexible Manufacturing Structures (T.Assist.Eng. Onu LUNGU)

SFF Classification. The interaction between the data flow and the material flow in SFF. The control unit hierarchy in SSF. Using of programmable controller as an integrated system in a local control unit. Use of programmable controller as local independent systems.

AAI-5-28: Virtual Instrumentation in Control (Assoc.Prof.Dr.Eng. Constantin VOLO ENCU)

Elements of graphical programming. Basics. Characteristic elements. Virtual functions and instruments. Working commands. How to create a virtual instrument. Advanced programming. Applications in digital signal processing. Signal synthesis. Frequency analysis. Transient regime analysis. Digital controllers. Applications in process control. Level control. Flow control. Pressure control. Temperature control. Data acquisition. Basic principles. Serial interface. Parallel interface.

First Year of Study (Master, AS)**AS-1-01: Complements of Systems Theory and Quality Engineering 1 (Prof.Dr.Eng. Toma Leonida DRAGOMIR)**

The course content: The topic of quality engineering. Elements of automatic systems dependability analysis. Design of availability and quality. Quality management- standards series ISO 9000. Evaluation and certifying systems. The competencies created by the course are: Generating basic knowledge in the Quality Engineering, particularly in the frame of quality assurance of control systems, Generating skills in using standards series ISO 9000.

AS-1-02: Modern Control Theory 1 (Prof.Dr.Eng. Radu-Emil PRECUP)

Development of adaptation strategies for fuzzy parameter tuning in case of several controller

structures: control structures with parameter tuning of conventional controllers; control structures with fuzzy parameter tuning of PI-fuzzy controllers; stability analysis methods for fuzzy control systems: state-space approach, Popov's theory, Lyapunov's theory, circle criterion, harmonic balance method; elements of optimal fuzzy control.

AS-1-03: Artificial Intelligence and Knowledge Engineering (Prof.Dr.Eng. Daniel Ioan CURIAC)

Survey of knowledge-based artificial intelligence - the study of how to program computers, using classical symbolic methods, to behave in ways normally attributed to "intelligence" when observed in humans. Topics chosen from: history, definition, and philosophical foundations of AI; search; propositional logic; predicate logic; knowledge representation; planning; natural-language processing; agents.

AS-1-04: Neural Networks (Prof.Dr.Eng. Nicolae ROBU)

The course starts with the main notions in the field. Follows the presentation of McCulloch-Pitts neural model and of the classes and main topologies of neural networks: the feed-forward neural networks (the simple perceptron, the unilayer and the multilayer multiperceptron), the bidirectional neural networks (the "associative memory" network, the "Hopfield" network). Then, it presents the ways in neural networks learning and the main algorithms and techniques for each topology; with a special attention to the error back propagation. Finally, the classical critical aspects related to the neural networks are treated.

AS-1-05: Complements of Systems Theory and Quality Engineering 2 (Prof.Dr.Eng. Toma Leonida DRAGOMIR)

Course content: Knowledge based systems. Interpolative systems in process control (based on fuzzy logic, RIP method and neural networks). Hybrid systems.

AS-1-06: Modern Control Theory 2 (Prof.Dr.Eng. tefan PREITL)

Advanced multivariable control design: approach methods; control objectives; criteria and performance indices; structural properties; parameter tuning methods for mv-ACS based on output feedback and on state feedback; case studies. Modern approaches in ACS design using autotuning of controllers. Modern approaches in predictive control. Modern approaches in 2-DOF control structures.

AS-1-07: Adaptive Control Systems (Prof.Dr.Eng. Octavian PRO TEAN)

Adaptive systems problematic and principles. Adaptive control structures. Model-reference adaptive control systems. Self-tuning adaptive control systems. Self-tuning control strategies synthesis: Minimum variance basic control strategy, Modified minimum variance control strategy, Minimum variance control strategy with measurable perturbation's compensation,

Generalized minimum variance control strategy (explicit self-tuning controller, implicit self-tuning controller). Study case - self-tuning control of the hydro generator's excitation system.

AS-1-08: Genetic Algorithms (Prof.Dr.Eng. L cr mioara STOICU TIVADAR)

Objective: Study of the genetic algorithms and the application. Contents: evolutionary computation,

biological terms, search space/search methods, fundamentals of genetic algorithms (GA), evolving computer programs, data analysis and prediction, GA in scientific models, theoretical foundations of GAs, implementing GAs.

3.2.A.3 Syllabus of the Courses Taught by Staff of the Other Departments

First Year of Study (SE)

SE-1-01: Mathematical Analysis (Prof.Dr. Octavian LIPOVAN)

The course provides a theoretical introduction and solutions to typical problems in Differential Calculus and Multiple Integrals. The main objectives are to consolidate the student's knowledge of the following concepts: convergence, limit, continuity, differentiability, partial derivatives, Taylor's and Laurent's series expansion, local extrema and Riemann integrability. The students will gain abilities to encompass the fundamental elements of mathematical reasoning, to distinguish between different levels of abstraction, and a coherent capacity of reasoning based on a sequence of logical deductions.

SE-1-02: Algebra and Geometry (Assoc.Prof.Dr. Dorina -Marieta RENDI)

The objective of the course is to give a theoretical introduction and solutions to typical problems in Algebra and Geometry, such as: linear spaces and subspaces, basis and dimension of a linear spaces, linear mappings, matrix of a linear mapping, eigenvalues and eigenvector, diagonal form of a matrix, quadratic forms and the canonical form, Euclidean linear spaces, ortogonal bases, orthogonal and simetric transformations, affine spaces, the straight line and the plane, conix and quadrix, differential geometry of curves and surfaces.

SE-1-04: Physics (Lect.Dr. Ioan ZAHARIE)

Objective: give to students the basic notions in physics that will allow a better understanding of the physical effects they are bound to encounter during professional life. The students will be able to use the appropriate tools to estimate the consequences of the different effects with the appropriate theoretical tools. Contents: Mechanics – conservation laws; Oscillations - free, damped and forced oscillations; Waves – waves phenomena; Thermodynamics and statistical physics - basics; Quantum mechanics - experimental bases; Solid state physics - electrical, thermal, magnetic and optical properties.

SE-1-05: Fundamentals of Mechanical Engineering (Prof.Dr.Eng. Doina DR GULESCU)

Course contents: Kinematics modeling of rigid bodies general and particular motions (translation, rotation with fixed axis; relative motion of rigid body); Array

representation of rigid body motions; Static modeling of rigid bodies systems (mechanical torques, mass distribution, modeling joints constraints and theirs reactions, equilibrium of rigid bodies systems); Dynamics modeling (fundamental characteristics, modeling dynamic behavior by using general theorems of dynamics, dynamic modeling of rigid body motions, modeling dynamic behavior by using analytical mechanics principles).

SE-1-10: Special Mathematics (Prof.Dr. Octavian LIPOVAN)

Objectives: to consolidate the student's knowledge of Integral Calculus (Line Integrals Surface Integrals, Integrals Theorems) Operational Calculus (Laplace Transform, Fourier Transform) and Differential Equations, to identify specific theoretical concepts in practical situations, to analyze practical and mathematical contexts using mathematical language, to formulate a practical problem in mathematical terms, to solve the problem and interpret the result. The competencies created are: computational skills, the ability to discover analogies between heterogeneous situations and to make interdisciplinary connections to use the specialized literature effectively and efficiently.

SE-1-13: Fundamentals of Electrical Engineering (Prof.Dr.Eng. Dumitru RADU)

The main objective of the course is the assimilation of basic knowledge of electrical circuits and electromagnetic field. The basic physical quantities, the main laws and theorems, and the analyzing methods are presented. Linear and nonlinear DC circuits, sinusoidal steady-state linear circuits, and circuits in transient state are studied. Also static electric and magnetic fields, electromagnetic induction phenomenon and electromagnetic wave equations are analyzed.

Second Year of Study (SE)

SE-2-02: Mechanical Systems Modeling (Prof.Dr.Eng. Doina DR GULESCU)

Course contents: Kinematics modeling of rigid bodies general and particular motions (translation, rotation with fixed axis; relative motion of rigid body); Array representation of rigid body motions; Modeling the complex motion of rigid bodies systems; Static modeling of rigid bodies systems (mechanical torques

as model of forces systems, mass distribution, modeling joints constraints and their reactions, equilibrium of rigid bodies systems); Dynamics modeling (fundamental characteristics, modeling dynamic behavior by using general theorems of dynamics, dynamic modeling of rigid body motions).

SE-2-07: Culture and civilization (T.Assist.Eng. Viorel SÎRBU)

The aim of the course is to provide a grounding in the European civilization and culture as well as the history of the European Union. Contents: introductory elements of culture and civilization, the main European treaties, the institutional structure of the European Union, common and specific elements at European countries, European values and symbols, the future of the European Union, Romania and the European Union.

SE-2-11: Measurements, Sensors and Transducers (Prof.Dr.Eng. Dan STOICIU)

Course contents: Metrology basics; Measurement error and uncertainty; Accuracy, confidence limits, confidence level; Measuring methods; Characteristics of measuring instruments; Voltage and current measurement; Frequency measurement; Oscilloscopes, analog and digital; Signals and noise; Signal conditioning (instrumentation amplifiers, sample and hold circuits, filters, current to voltage conversion, analog multiplexers, isolation amplifiers); A/D and D/A conversion (parallel, successive approximation and dual slope A/D converters); Data acquisition systems; Virtual instrumentation; Sensors and transducers (temperature, geometric displacement, force, torque, vibration, pressure, level, flow).

SE-2-16 : Microeconomics (Assoc. Prof. Septimiu POP)

Objective: Study of fundamentals of basic theory of microeconomics and contemporary market economy. Contents: general presentation of microeconomics, the contemporary market economy, economic agents, production factors, economic competition, offer and demand, money, income, profit, production costs.

Third Year of Study (AAI)

AAI-3-01: Management (Assoc.Prof.Dr.Eng. Gabriela PRO TEAN)

The course will involve the students in a demanding process of personal and managerial development, learning to enhance individual managerial understanding and effectiveness and as well to work relationships with a diverse group of colleagues. The discipline curricula include the concept of management, the scientific, human and quantitative approach, and the steps in creating a company, alternatives of businesses. The five functions of management (forecast/planning, organizing, ordering, leading and controlling) are presented in the context of nowadays realities.

AAI-3-11: Economy (Assoc.Prof.Dr. Septimiu POP)

The main objective of this course is to provide information and knowledge concerning the basics in economy for engineering students. The curricula includes titles such as: the system of the socio-economic activities, the contemporary market, the economic agents, the production factors, price and market mechanisms, competition, supply and demand, money and inflation. All of these concepts and mechanisms are taught so that they can be applicable under the conditions of the existing economy system in Romania.

Fourth Year of Study (AAI)

AAI-4-01: Finances of Trading Companies (Lect.Dr. Eugenia GRECU)

The course of Finances of trading companies offers information about the patrimonial and financial structure of enterprises, as well as the existing possibilities for a financial equilibrium and the share capital growth. Also, it analyses the enterprises possibilities to be financed by bond loans, banking credit, leasing. The risk, investment decisions, taxes and sythesis documents for trading companies activities are some of the other topics the students have the possibility to study when taking this course.

AAI-4-12: Marketing (Prof.Dr.Eng. Anghel T ROAT)

The main objective of Marketing discipline is to provide knowledge about principles, techniques and specific models of marketing, as much to the conceptual level and to the level of them application in the real conditions of market. The discipline curricula include: the concept of marketing, the stages of marketing evolution in the market economy, the marketing-mix, the management of marketing. The marketing curricula also include: the information systems for market research and de marketing strategic planning.

AAI-4-28, AAI-5-29: Communication Skills (Assoc.Prof.Dr. Gabriela PRO TEAN)

“Communication skills” provide one of the most important adeptness in life. The discipline curricula include skills for developing a center of security, guidance, wisdom and power in behavior, skills in thinking “win to win” solutions, principles of personal management, skills in listening/understanding and then to be understood, principles of empathic communication, principles of creative cooperation (synergies).

Fifth Year of Study (AAI)

AAI-5-04: Non Electrical Actuators (Lect.Dr.Eng. Adriana MANEA)

Hydraulically and pneumatically working systems. Definition. Classification. Structure. Symbols. Uses fluids. Hydraulically and pneumatically volume

machine: pumps and motors. Hydraulically and pneumatically distributing elements, operated valves, measurements elements, flow controller. Classification. Symbols. Selection. Hydraulically and pneumatically auxiliary equipment: reservoirs, filters, accumulators, pipes, measurements and controls equipment. Hydraulically and pneumatically function schemes. Automation of hydraulically and pneumatically function schemes.

AAI-5-16: Biomedical Engineering (Prof.Dr.Eng. Mirela TOTH-TA C U)

The aim of the module is to offer fundamental knowledge in biomedical engineering. This course

presents both the modeling problems of several biological systems and medical equipment. There are studied different medical equipment - for diagnosis, therapy and laboratory equipment and their methods of use; medical imaging based on computer tomography, methods and techniques used in Röntgendiagnosis, ultrasound equipments, mechanical characteristics of biological fluids, blood and vascular tissue rheology, artificial kidney and haemodialysis.

3.2.C Computer and Software Engineering Section

3.2.C.1 Curricula

Computers and Information Technology Specialization (CTI, 4 years)

First Year of Study						
Nr. "xx"	Course Name (Code: "CTI-1-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Mathematical Analysis	5	28	28	–	–
02	Algebra and Geometry	4	28	28	–	–
03	Physics	4	28	14	14	–
04	Computer Programming	5	28	–	28	–
05	Discrete Logic and Structures	5	28	28	–	–
06	Foreign Languages 1	2	–	28	–	–
07	Sports 1	1	–	28	–	–
08	Culture and Civilization	2	14	14	–	–
09	Applied Activities (45 hours)	2	–	–	–	–
10	Computer-Assisted Mathematics	4	28	14	14	–
11	Special Mathematics (Probability and Statistics)	4	28	28	–	–
12	Fundamentals of Electrical Engineering	4	28	14	14	–
13	Fundamentals of Electronic Engineering	4	28	–	14	–
14	Programming Techniques	4	28	–	28	–
15	Digital Logic	5	42	–	28	–
16	Foreign Languages 2	2	–	28	–	–
17	Sports 2	1	–	14	–	–
18	Applied Activities (45 hours)	2	–	–	–	–

Second Year of Study						
Nr. "xx"	Course Name (Code: "CTI-2-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Fundamentals of Mechanical Engineering and Robotics	3	28	–	14	–
02	Data Structures and Algorithms	5	28	–	28	–
03	Object-Oriented Programming	4	28	–	28	–
04	Measurement Principles and Techniques	4	28	14	14	–
05	Computer Architecture	5	28	–	28	–
06	Digital Circuits and Signals	4	28	–	28	–
07	Communication	2	14	28	–	–
08	Sports 1	1	–	14	–	–
09	Applied Activities (45 hours)	2	–	–	–	–
10	Micro-Economy	3	28	14	–	–
11	Algorithm Design and Analysis	4	28	–	28	–
12	Fundamentals of Software Engineering	5	28	–	28	14
13	System Theory and Automatics	5	28	7	21	–
14	Computer Organization	5	28	–	28	14
15	Integrated Circuits (opt.)	5	28	–	28	14
16	Fundamentals of Programming Languages (opt.)	5	28	–	28	14
17	Sports 2	1	–	14	–	–
18	Applied Activities (45 hours)	2	–	–	–	–

Computers Specialization (C, 5 years)

Third Year of Study						
Nr. "xx"	Course Name (Code: "C-3-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Economy 1	3	28	14	–	–
02	Computer Engineering 1	5	42	–	14	14
03	Large-Scale Integrated Circuits	5	35	–	28	–
04	Data Structures and Algorithm Analysis	5	42	–	28	–
05	Assembly Language Programming	5	35	–	28	–
06	Digital Microsystems Design (opt.)	5	28	–	14	14
07	System Theory 2 (opt.)	5	28	–	28	–
08	Applied Activities (45 hours)	2	–	–	–	–
09	Economy 2	3	14	14	–	–
10	Computer Engineering 2	4	42	–	14	–
11	Microprocessor-Based Systems	5	42	–	14	14
12	Data Structures and Algorithm Analysis (proj.)	1	–	–	–	14
13	Elements of Computer Graphics	5	42	–	28	–
14	Theory of Computation (opt.)	5	35	14	14	–
15	Fundamentals of Programming Languages (opt.)	5	35	–	28	–
16	Semiconductor Memories (opt.)	5	35	–	28	–
17	Application-Oriented Embedded Systems (opt.)	5	35	–	14	14
18	Industrial Robot Dynamics (opt.)	5	35	–	14	14
19	System Identification	5	35	–	28	–
20	Applied Activities (45 hours)	2	–	–	–	–

Fourth Year of Study						
Nr. "xx"	Course Name (Code: "C-4-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Management	2	14	14	–	–
02	Input-Output Systems	5	35	–	28	–
03	Database Systems	4	28	–	28	–
04	Operating Systems 1	5	35	–	28	–
05	Compiling Techniques	4	28	–	14	14
06	Digital Signal Processing (opt.)	4	28	–	28	–
07	Software Engineering 1 (opt.)	4	28	–	28	–
08	Automated Speech Processing (opt.)	4	28	–	28	–
09	Computer Aided Design Techniques (opt.)	4	28	–	28	–
10	Quality in Information Technology (opt.)	4	28	–	28	–
11	Applied Activities (45 hours)	2	–	–	–	–
12	Marketing	2	14	14	–	–
13	Local Area Computer Networks	5	35	–	28	–
14	Basic Concepts of Artificial Intelligence	5	35	–	28	–
15	Modern Digital Telecommunications (opt.)	4	28	–	28	–
16	Peripheral Equipments (opt.)	4	28	–	14	14
17	Digital Data Acquisition and Processing (opt.)	4	28	–	14	14
18	Database Systems Design (opt.)	4	28	–	14	14
19	Operating Systems 2 (opt.)	4	28	–	14	14
20	Programming Systems for Computer Networks (opt.)	4	28	–	28	–
21	Internet Technologies (opt.)	4	28	–	28	–
22	Hardware Resource Handling Techniques (opt.)	4	28	–	–	14
23	Professional Communication (opt.)	4	14	28	–	–
24	CASE Tools (opt.)	4	28	–	28	–
25	Computer System Security (opt.)	4	28	–	28	–
26	Applied Activities (45 hours)	2	–	–	–	–

Fifth Year of Study						
Nr. "xx"	Course Name (Code: "C-5-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Computer Network Design (opt.)	5	42	–	14	14
02	Fault Tolerant Systems (opt.)	5	42	–	14	14
03	Parallel Architectures (opt.)	5	42	–	28	–
04	Data Coding Techniques (opt.)	5	42	–	28	–
05	Distributed Computing Systems (opt.)	5	42	–	14	14
06	Computing Systems Reliability (opt.)	5	42	–	14	14
07	Image Processing and Recognition (opt.)	5	42	–	14	14
08	Artificial Intelligence Systems (opt.)	5	42	–	28	–
09	Software Engineering 2 (opt.)	5	42	–	14	14
10	Real-Time Programming Systems (opt.)	5	42	–	14	14
11	Modeling and Simulation (opt.)	5	42	–	28	–
12	Translator Design (opt.)	5	42	–	14	14
13	Artificial Intelligence (opt.)	5	42	–	28	–
14	Expert Systems (opt.)	5	42	–	14	14
15	Distributed Database Systems (opt.)	5	42	–	14	14
16	Parallel Computing Algorithms (opt.)	5	42	–	14	14
17	Computing Systems Testing (opt.)	5	42	–	14	–
18	High-End Interfaces and Equipments (opt.)	5	42	–	14	–
19	Fuzzy Logic and Applications (opt.)	5	42	–	14	–
20	Multiprocessor Systems (opt.)	5	42	–	14	–
21	Optical Fiber Transmissions (opt.)	5	42	–	14	–
22	Software Verification and Validation (opt.)	5	28	–	28	–
23	Computer Aided Integrated Production Systems (opt.)	5	28	–	28	–
24	Machine Learning (opt.)	5	28	–	28	–
25	Advanced Digital Signal Processing (opt.)	5	28	–	28	–
26	Hardware-Software Co-Design (opt.)	5	28	–	28	–
27	Graphics Processing Systems (opt.)	5	28	–	28	–
28	Diploma Project (project)	30	–	–	–	168

Master Specialization: Advanced Computing Systems (ACS, 2 years)

First Year of Study						
Nr. "xx"	Course Name (Code: "ACS-1-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Embedded Systems	8	28	–	–	14
02	Mobile Communication Systems	7	28	–	–	14
03	Advanced Artificial Intelligence and Cognitive Models	8	28	–	–	14
04	Formal Verification	7	28	–	–	14
05	Distributed Systems Design	8	28	–	–	14
06	Emerging Technologies	7	28	–	–	14
07	Software Project Management	8	28	–	–	14
08	Heuristic Methods (opt.)	7	28	–	–	14
09	Software Quality Assurance (opt.)	7	28	–	–	14

Second Year of Study						
Nr. "xx"	Course Name (Code: "ACS-2-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Component-Based Software Engineering (opt.)	8	28	–	–	14
02	Digital Control Systems (opt.)	7	28	–	–	14
03	Data Mining (opt.)	8	28	–	–	14
04	Real Time UML (opt.)	7	28	–	–	14
05	Hardware-Software Codesign (opt.)	8	28	–	–	14
06	Dissertation Thesis (proj.)	30	–	–	–	168

3.2.C.2 Syllabus of the Courses Taught by the Department Staff

First Year of Study (CTI)

CTI-1-04: Computer Programming (Prof.Dr.Eng. Horia CIOCĂRLIE)

The aim of the course is to provide the fundamental programming concepts with C language examples. Thus, of the following notions will be presented: the predefined data types, the constants, the variables, the expressions, the standard writing and reading functions, the statements, the user defined functions, the structured data types, the pointers and the dynamic memory allocation.

CTI-1-05: Logic and Discrete Structures (Prof.Dr.Eng. Marius CRI AN)

The course discusses integers, propositions, sets, relations and functions, which are all discrete. The course starts introducing sets, operations on sets, and properties of set operations. Then, graphs and trees, functions, and relations are studied. Finally, propositional and first-order predicate calculus, and computational logic are introduced. After this course students will understand concepts associated with discrete objects, their properties, and relationships among them. Students will obtain skills in discrete structures and logic, to be further used in computer science.

CTI-1-14: Programming Techniques (Prof.Dr.Eng. Horia CIOCĂRLIE)

The object of the course consists of completing the programming knowledge achieved during the initiating programming course, with more C facilities and with programming techniques that are specific to an advanced programming course. Thus, the following notions will be presented: the file, the pointer and the memory dynamic allocation, the dynamic data structures, the interface of UNIX operating system, the abstract data types, the searching and sorting techniques.

CTI-1-15: Digital Logic (T.Assist.Eng. Adrian MIH ILESCU)

The aim of the course represents the analysis and synthesis of combinational and sequential digital devices providing knowledge of minimization methods of Boolean functions and synthesis techniques of switching functions by means of logic

gates, encoders, decoders, multiplexers, FPLA, PROM memories, programmable structures. The sections regarding sequential automata synthesis provides grounding in the theory of finite state automata, minimization methods, synthesis techniques of sequential synchronous circuits via ASM diagrams using bistables, PROM memories, transfer relations. The theoretical aspects are being associated with series of relevant applications.

Second Year of Study (CTI)

CTI-2-02: Data Structures and Algorithms (Prof.Dr.Eng. Vladimir CRE U)

It is one of the fundamental courses in the domain. Its main objectives are to present data structures as abstract data types in strong interdependency with the algorithms implementing the specific operators defined on these types. It requires as prerequisite medium level programming knowledge, preferably C. The main topics are: Fundamental Data Structures (Data types, Abstract Data Types-ADT, Objects); Algorithms (Definition, Analysis, Asymptotic Notation, Profiling): Sorting (Internal, External); Strings (ADT, Implementation, String Search); Recursion (Algorithms, Data Structures); Lists (ADT, Implementation, Circular, Double Linked, Stacks, Queues. Multilists, Generalized); Tables (ADT, Implementation Techniques, Hash).

CTI-2-03: Object-Oriented Programming (Prof.Dr.Eng. Ioan JURCA)

This course presents the main concepts and techniques of object-oriented programming, using as a vehicle the Java programming language. At the end of the semester the students must be able to design and implement programs of medium complexity according to the objectual paradigm.

CTI-2-05: Computer Architecture (Prof.Dr.Eng. Mircea VL DU IU)

This course is aiming at providing knowledge on the structural units as computing system architecture components. Revealing the performance discrepancies between the functional units of the computer is also emphasized, so that searching for its optimal usage becomes possible.

CTI-2-06: Digital Circuits and Signals (Prof.Dr.Eng. Mircea STRATULAT)

The main objectives of the course are: Study of the analysis methods of digital signals (ideal and real-life digital signals, elementary signals); Integral-differential methods of analysis, associated to circuits; Methods of effect superposition; Dynamic parameters of digital devices and circuits; The duality of numeric circuits (logic and electronics, design of numeric circuits).

CTI-2-11: Algorithm Design and Analysis (Prof.Dr.Eng. Vladimir CRE U)

The course presents aspects related to algorithms design and performance analysis in the context of the advanced data structures. Prerequisite: Data Structures and Algorithms course. Main topics: Trees (Abstract Data Type - ADT Tree, Implementation, Binary, Binary Search, Trie, Balanced, AVL, Optimal Search, Huffman, B-Trees, Binary B-Trees); Sets (ADT Set, Advanced Implementations, Merge&Find, Merge&Split); Graphs (ADT, Implementation, Undirected, Fundamental Traversal, Spanning Trees, Graphs and Connections, Articulation Points, Biconnected Components); Weighted Graphs, Minimum Cost Spanning Trees; Directed Graphs, Directed Acyclic Graphs; Strong Components; Network Flows; Graph Matching.

CTI-2-12: Fundamentals of Software Engineering (Prof.Dr.Eng. Ioan JURCA)

The course presents the main concepts, methods and techniques of software engineering, with an emphasis on object orientation and iterative development. All software process stages (requirements specification, design, implementation and testing, evolution) are briefly covered. At the end of the semester the students must be able to appreciate the importance of applying engineering methods to develop software products of high quality, delivered on time and within budget.

CTI-2-14: Computer Organization (Prof.Dr.Eng. Mircea VL DU IU)

This course presents the way that central processing units function. In that respect, the instruction set design and evaluation principles are provided. At the same time, the microprogramming design techniques for control units are pursued.

CTI-2-15: Integrated Circuits (Prof.Dr.Eng. Mircea STRATULAT)

The main topics of this course are: Definition of the specific parameters of integrated circuits; The TTL family of integrated circuits (the standard series, the TTL series: S, LS, AS, ALS, F); Power, open-collector circuits with high impedance, bus drivers; The NMOS family of integrated circuits; The CMOS family (standard series, HCMOS, ACMOS, BiCMOS).

CTI-2-16: Fundamental Concepts of Programming Languages (Prof.Dr.Eng. Horia CIOCĂRLIE)

The object of course is to study the programming languages. We are interested in studying the fundamental concepts that are at the base of programming language design and the development of these concepts together with the evolution of programming languages. Also we shall categorize the programming languages by family, thus facilitating their study and understanding. The content of the course is: introduction, formal representation of programming languages, programming languages entities attributes, passing of data as parameters, data types, abstract data types, object oriented languages, programming languages control structures.

Third Year of Study (C)**C-3-02: Computer Engineering 1 (Prof.Dr.Eng. Mircea VL DU IU)**

The course is focusing on the models and methods that are used for the design and analysis of fault tolerant and highly reliable computer systems. The fault tolerance objective is paramount in implementing application specific systems like communication networks and flight control. This course aims at providing acquaintance with the basic and state-of-the-art concepts for the design and analysis of fault tolerant systems. Some commercial fault tolerant systems will be studied, along with the techniques used for designing them.

C-3-03: Large-Scale Integrated Circuits (Prof.Dr.Eng. Mircea STRATULAT)

Course contents: ECL integrated circuits, ECL family of integrated circuits, other types of ECL integrated circuits, I²L integrated circuits, flip-flop bi-stable integrated circuits, integrated Schmitt triggers, flip-flop mono-stable circuits, flip-flop a-stable circuits, family of integrated circuits.

C-3-04: Data Structures and Algorithm Analysis (Prof.Dr.Eng. Vladimir CRE U)

The course presents aspects related to algorithms design and performance analysis in the context of the advanced data structures. Prerequisite: Data Structures and Algorithms course. Main topics: Trees (Abstract Data Type - ADT Tree, Implementation, Binary, Binary Search, Trie, Balanced, AVL, Optimal Search, Huffman, B-Trees, Binary B-Trees); Sets (ADT Set, Advanced Implementations, Merge&Find, Merge&Split); Graphs (ADT, Implementation, Undirected, Fundamental Traversal, Spanning Trees, Graphs and Connections, Articulation Points, Biconnected Components); Weighted Graphs, Minimum Cost Spanning Trees; Directed Graphs, Directed Acyclic Graphs; Strong Components; Network Flows; Graph Matching.

C-3-05: Assembly Language Programming (Prof.Dr.Eng. Ionel JIAN)

The course pursues knowing (knowledge of): the 80x86 instruction set, the addressing modes, assembly language programming techniques, the use of subroutines, DOS functions, macro instructions, ASCII to binary and binary to floating point conversion programs, 8087 math coprocessor structure and programming.

C-3-06: Digital Microsystems Design (Prof.Dr.Eng. Mircea POPA)

The discipline presents typical problems in designing digital micro-systems: microprocessors, buses, connection of memories to the central unit of a digital micro system, connection of input/output ports to the central unit of a digital micro system, programmable dedicated circuits (8251 for serial interfaces, 8253 for timing and event counting applications, 8255 for parallel interfaces) digital micro-systems with microcontrollers, typical applications.

C-3-10: Computer Engineering 2 (Prof.Dr.Eng. Mircea VL DU IU)

The course is focused on models and methods used for the analysis and design of IO systems, interconnections in digital systems and error control. Error management is crucial for communication and storage networks, while performance is another crucial target. The course provides the basics involved in performance design and methods for performance analysis and also approaches the topics of error detecting and correcting codes and dependable synthesis for memory units and processors.

C-3-11: Microprocessor-Based Systems (Prof.Dr.Eng. Mircea POPA)

The discipline approaches the following topics: General characteristics of 16 and 32 bits microprocessors, X86 microprocessors (8086 and 80386), 680x0 microprocessors (68000 and 68030), the PC microcomputer: parallel, serial and USB ports, motherboard, interrupt system, typical applications.

C-3-13: Elements of Computer Graphics (T.Assist.Eng. Sorin BABII)

The course will introduce the fundamentals of computer graphics programming, various implementations and algorithms for specific operations, with emphasize on analysis and performance evaluation: line algorithms, polygon drawing, clipping and filling, circles and ellipses, 2D and 3D transformations, view transformations, curves and surfaces.

C-3-14: Theory of Computation (Prof.Dr.Eng. Marius CRI AN)

The course covers the theoretical principles of informatics and presents the basic models of computation along with the corresponding grammars. The problem of decidability and the classes of decidable problems are also studied. The fundamentals of complexity theory with the complexity classes

constitute the second part of the course. Finally, the problem of physical modeling of computation is introduced.

C-3-15: Fundamental Concepts of Programming Languages (Prof.Dr.Eng. Horia CIOCĂRLIE)

The object of course is to study the programming languages. We are interested in studying the fundamental concepts that are at the base of programming language design and the development of these concepts together with the evolution of programming languages. Also we shall categorize the programming languages by family, thus facilitating their study and understanding. The content of the course is: introduction, formal representation of programming languages, programming languages entities attributes, passing of data as parameters, data types, abstract data types, object oriented languages, programming languages control structures.

C-3-16: Semiconductor Memories (Prof.Dr.Eng. Mircea STRATULAT)

Course contents: Large scale integrated circuits, fixed semiconductor memories, programmable logic devices (PLD), RAM memories, extending memory capacity, other types of semiconductor memories.

C-3-17: Application-Oriented Embedded Systems (Prof.Dr.Eng. Mircea POPA)

The discipline presents the place and role of microcontrollers, microcontroller structure, microcontroller and microprocessor-programmable dedicated circuit relation, microcontroller-DSP relation. Several families of microcontrollers are described: the 80C51 family (80C51 microcontroller, 8x8552 microcontroller) the PIC microcontrollers (PIC 16F8X microcontrollers), the Motorola M68HC11 family (M68HC11 microcontrollers), the Siemens SAB8xC166 microcontrollers. Typical applications are presented: external memories connection, microcontrollers in the automotive field, embedded Internet.

Fourth Year of Study (C)**C-4-02: Input-Output Systems (Prof.Dr.Eng. Cri an STRUGARU)**

This course presents the input-output subsystem in a computer: interrupt controller, DMA controller, keyboard, printers, disk controller, hard disk and floppy disk, video card.

C-4-03: Database Systems (Prof.Dr.Eng. Ionel JIAN)

Relational database systems design and implementation principles are shown. Sequential and direct "access to information" modes are analyzed using different search conditions and looking to database access speed gains and protection. The way the "graphical user interfaces" are implemented using Windows objects is also presented in this course. Database design elements (principles) based on

structure normalization and relational algebra are also covered.

C-4-04: Operating Systems 1 (Prof.Dr.Eng. Ioan JURCA)

This course is an introduction to the main concepts of general-purpose operating systems, illustrated with UNIX and Windows-type implementations. At the end of the semester the students must be able to understand the structure of the different components of an operating system, to write scripts and also programs that use directly operating system calls.

C-4-05: Compiling Techniques (Prof.Dr.Eng. Horia CIOCĂRLIE)

The compilation techniques are specialized programming techniques that are used for both translation program writing and for developing a variety of translator-like programs: operating systems, database management systems, text editors, utility programs and even simple applications which involve, as an user interface, a communication (command) language. Thus, the course presents the most used lexical and syntactic analysis techniques, the semantic analysis and the intermediate code generation.

C-4-06: Digital Signal Processing (Assoc.Prof.Dr.Eng. Mihai MICEA)

During this course, the students will gain detailed knowledge on the main techniques involved in the digital conversion, analysis and processing of signals and systems, both in the time and frequency domains. Students will also gain abilities of using general purpose and specialized digital processing systems (e.g. digital signal processors, DSPs) to apply these techniques and knowledge in various engineering domains.

C-4-07: Software Engineering 1 (Prof.Dr.Eng. Ioan JURCA)

The course presents the main concepts, methods and techniques of software engineering, with an emphasis on object orientation and iterative development. All software process stages (requirements specification, design, implementation and testing, evolution) are briefly covered. At the end of the semester the students must be able to appreciate the importance of applying engineering methods to develop software products of high quality, delivered on time and within budget.

C-4-08: Automated Speech Processing (Lect.Dr.Eng. Marian BOLDEA)

Course contents: introduction, speech producing and modeling, vocal signal analysis, automatic speech synthesis, automated speech recognition, examples.

C-4-09: Computer Aided Design Techniques (Assoc.Prof.Dr.Eng. Doru TODINC)

The aims of the course are: Modeling and simulation of digital systems using hardware description languages; developing techniques for structural design

of computer systems with VHDL; learning VHDL, as a representative hardware description language.

C-4-10: Quality in Information Technology (T.Assist.Dr.Eng. Constantin COSOVAN)

The objectives of the quality characteristics. Quality systems, ISO 9000 and 25000 standards, norms, guides, and the audit of quality systems. The management of total quality, implementation and audit. Hardware and software quality, CMMI methodologies, metrices. Technology; definitions, its science and functions. Information with the classical, algorithmic and quantic meaning.

C-4-13: Local Area Computer Networks (Prof.Dr.Eng. Cri an STRUGARU)

This course presents the main layers, protocols and applications available in local area networks. Physical, data and networks layers from the OSI model are covered. Different types of LAN and their protocols are covered: Ethernet, Token ring/bus, FDDI, ISDN, ATM.

C-4-14: Basic Concepts of Artificial Intelligence (Prof.Dr.Eng. Stefan HOLBAN)

This course presents many concepts in artificial intelligence (AI) and problem-solving systems in terms of the Prolog language. Its stated purpose is to provide an informal, hands-on approach to learning AI. The main chapters of the course emphasize, in logical progression, on topics including knowledge representation, inferences on the representation, rule-based systems codifying classes of inferences, the search as an abstraction of rule-based systems, extensions of methodology, and evaluation of systems.

C-4-15: Modern Digital Telecommunications (Assoc.Prof.Dr.Eng. Mihai MICEA)

During this course, the students will learn the principles of information transmission over analog and digital channels, the architecture and operation basics of digital fixed and mobile telecommunication standards, with special emphasis on Alcatel systems (Alcatel 1000 E 10 digital switching center, GSM and GPRS equipments, etc.). Students will also gain, through practical workshops on Alcatel training equipments, the necessary abilities to configure and operate the digital telecommunication systems.

C-4-16: Peripheral Equipments (Prof.Dr.Eng. Cri an STRUGARU)

This course presents the input-output devices and equipments, starting from standard busses description, continue with different types of I/O devices (mouse, modem, scanner, fax and CRT monitor) and in the end high level equipments are described like mobile phone, digital TV, weather satellites. Other topics like security, encodings are covered.

C-4-17: Digital Data Acquisition and Processing (Prof.Dr.Eng. Mircea STRATULAT)

Course contents: operational amplifiers, instrumental amplifiers, isolation amplifiers, signal multiplexing,

signal sampling, digital-to-analogue converter, analogue-to-digital converter, data acquisition systems and interfacing, data distribution system and interfacing.

C-4-18: Database Systems Design (Prof.Dr.Eng. Ionel JIAN)

The course presents the relational (object oriented) database building principles and corresponding implementation methods. Illustration of these principles is done in Visual dBase, SQL and PL/SQL Oracle, looking to database access speed gains and protection. Graphical interfaces are implemented using Windows objects; user defined classes are developed and used. Database design is based on normalized structures and finally on implementation in Oracle Developer.

C-4-19: Operating Systems 2 (Prof.Dr.Eng. Ioan JURCA)

This course presents the concepts and algorithms used in designing the main modules of operating systems: process synchronization and communication, memory management (including virtual memory), scheduling, input/output management, file systems, security.

C-4-20: Programming Systems for Computer Networks (Prof.Dr.Eng. Ioan JURCA)

The course presents the most important techniques for programming distributed software applications: sockets, remote procedure calls, remote method invocations, Enterprise Java Beans, Web services. At the end of the course the students must be able to decide when it is appropriate to use each such technique, and to design and implement such applications.

C-4-21: Internet Technologies (T.Assist.Eng. Carmen HOLOTESCU)

The main objectives of the course are: the design of interactive web pages and the design of the components of a web portal.

C-4-22: Hardware Resource Handling Techniques (Assoc.Prof.Dr.Eng. Marius MARCU)

This course presents the interface between I/O physical devices and modern operating systems (Windows and Linux) using device drivers. The courses of this discipline cover topics like Plug-and-Play, I/O detection, I/O synchronization, I/O request level, power management, thermal management and the main topic is different types of device drivers' development.

C-4-25: Computer System Security (Assoc.Prof.Dr.Eng. Marius MINEA)

Present the main security problems of computer systems and networks, basic notions in defining security, mathematical methods for modeling and analysis, and the fundamentals of implementation, from cryptography to security protocols and services. Gain the ability to question the security of a system, to

evaluate it and to use techniques and tools for detecting security problems and securing systems.

Fifth Year of Study (C)

C-5-01: Computer Network Design (Prof.Dr.Eng. Cri an STRUGARU)

This course presents ATM and GSM computer networks design. ATM model, ATM frames, QOS, traffic control and congestion control, ATM devices are covered at the ATM side. For the GSM networks: GSM architecture and equipments, radio channels allocation, localization, multiplexing, roaming and other aspects are presented.

C-5-02: Fault Tolerant Systems (Lect.Dr.Eng. Lucian PRODAN)

Dependability concerns have to be addressed by engineering design since neither computer hardware nor software can be made totally immune to unpredictable behavior. A key issue in achieving dependable design is fault tolerance. This course presents the causes of computer system failures (impairments to dependability) and techniques for ensuring correct and timely computations despite such impairments. Examples will also be given on checking computing structures for defects and assessing their reliability levels.

C-5-03: Parallel Architectures (Prof.Dr.Eng. Mircea POPA)

The discipline approaches the following topics: Parallel system performance, Pipeline based architectures, Memory organization in parallel systems, Interconnection networks and Algorithms parallelization.

C-5-04: Data Coding Techniques (Lect.Dr.Eng. Marian BOLDEA)

Course contents: introduction, discrete sources of information, data compression, error control.

C-5-05: Distributed Computing Systems (Assoc.Prof.Dr.Eng. Marius MARCU)

The course presents the most important distributed architectures and their technologies: multiprocessor systems, multicore systems, multicomputer systems, computer clusters, grid computing.

C-5-06: Computing Systems Reliability (Lect.Dr.Eng. Mihai UDRESCU)

As the common perspective on computer systems is driven by time and space requirements, this course proposes a reliability-based approach. Investigating the computer reliability issues is now motivated by the problems brought by the emerging computing technologies. The emphasis is put on the methodologies and techniques which are employed for assessing and improving the reliability (and availability) of computer hardware, software and networks.

C-5-07: Image Processing and Recognition (Assoc.Prof.Dr.Eng. Hora iu MOLDOVAN)

The image processing techniques are necessary for two categories of applications: - increasing the image quality to facilitate the human interpretation and – data processing to facilitate the machine perception. To reach the recognition level there are necessary some previous steps: image acquisition, preprocessing, segmentation, representation and description, recognition and interpretation.

C-5-08: Artificial Intelligence Systems (Prof.Dr.Eng. Marius CRI AN)

The course presents the theoretical foundations of artificial intelligence (AI). First, representation and methods in artificial intelligence are introduced, followed by elements of logic and resolution-based proving. Finally, some learning concepts and cognitive models are studied. Upon completion of this course students will be able to apply AI techniques for practical solving problems.

C-5-09: Software Engineering 2 (Assoc.Prof. Dr.Eng. Radu MARINESCU)

The objective of the course is to familiarize the students with advanced design techniques for large applications, with an emphasis on the design of object-oriented software systems, enabling the students to learn to define design solutions leading to comprehensive and maintainable software which is immune to future changes of specifications.

C-5-10: Real-Time Programming Systems (Prof.Dr.Eng. Vladimir CRE U)

The course presents the methodological and theoretical support for analyze, design, implementation, evaluation and testing of the real-time systems and applications. Main topics: Real-Time Systems. Definition; Modeling Issues; Modeling Heuristics; Modeling Transformations; Control Transformations; Data Transformations; Stored Data; Organizing the Model; Essential Model Heuristics; Defining System Context; Modeling External Events; Deriving the Behavioral Model; Implementation Modeling Heuristics.

C-5-11: Modeling and Simulation (Prof.Dr.Eng. Stefan HOLBAN)

Complex problems presented to industry often require the application of modeling techniques, which include a wide array of mathematical optimization approaches, network modeling methods, queuing models and simulation. Discrete event simulation is often used to develop and analyze system models which are too complex, dynamic or stochastic for the efficient application of mathematical optimization. The ability to model, analyze and design complex systems is a key skill that differentiates industrial engineers and engineering management specialists from their counterparts in other engineering disciplines.

C-5-12: Translator Design (Prof.Dr.Eng. Horia CIOCÂRLIE)

The course presents advanced programming techniques that are useful in wide range of applications in which two systems communicate, the most frequent case being that when the two systems are the human user and the computer. This knowledge is important even in the phase of defining and designing a communication language. When correctly applied, they can lead to a simplified language and thus to an efficient translation process.

C-5-13: Artificial Intelligence (Prof.Dr.Eng. Stefan HOLBAN)

This course provides an introduction to search techniques in state space. Students will learn the basics of search algorithm development with an emphasis on real world applications. Topics include Search Problems and State Spaces Blind Search (Depth-First Breadth-First Iterative Deepening) Heuristic Search (Hill Climbing Best First A* Algorithm A* Search with Simple Pruning AND/OR Trees) Game Playing (Game State Evaluation Minimax Method Alpha-Beta Pruning Comparing Alpha-Beta with Minimax). This course gives a wide exposition of these techniques and their software tools.

C-5-14: Expert Systems (Assoc.Prof.Dr.Eng. Dan PESCARU)

This course concentrates on main expert system implementing methods. It emphasizes domains for applications, strengths and weak points of all presented methods. Methods covered: decision support systems based on statistical data, knowledge based systems, fuzzy expert systems, symbolic processing graphs and neural network based expert systems. The course will develop students' ability to implement complex expert systems. Every method is accompanied by practical real world examples covering multiple domains.

C-5-15: Distributed Database Systems (Prof.Dr.Eng. Ionel JIAN)

This course presents define and use Oracle PL/SQL packages and objects, physical and logical organization of data in databases on RAM and disc memory. Configure and administration Oracle Infrastructure components with enterprise Manager, database optimization, queries optimization by cost and heuristic methods. Distributed database design used Internet access technology. Applications developed by Forms&Reports Builder.

C-5-16: Parallel Computing Algorithms (Assoc.Prof.Dr.Eng. Ioana ORA)

This course is an introduction to parallel computing, with a focus on the design of parallel algorithms and on techniques for parallelisation of problem solving. Topics include: Taxonomy of parallel computers; Performance metrics for parallel systems; Principles of parallel algorithm design – decomposition

techniques, mapping techniques, parallel algorithm models; Programming using the message passing paradigm; Programming using shared memory.

C-5-17: Computing Systems Testing (Prof.Dr.Eng. Mircea VL DU IU)

The course introduces fundamentals of theory and practice of detecting failures in complex digital systems, fault analysis, test generation, and design for testability for digital ICs and systems. Covered topics include circuit and system modeling; fault modeling and simulation methods, automatic test pattern generation (ATPG), algorithms for combinational and sequential circuits, testability measures, design-for-testability, VLSI testing issues and processor and memory testing. Hands-on experience with computer-aided test tools will be provided in the laboratory.

C-5-18: High-End Interfaces and Equipments (Prof.Dr.Eng. Mircea STRATULAT)

Course contents: Optical physics, Optical data recording, Optical data reading, CD playback system, Magneto-optical recording, DVD playback system, Blue-ray disc, HD-DVD and HD-TV.

C-5-19: Fuzzy Logic and Applications (Assoc.Prof.Dr.Eng. Doru TODINC)

The course presents an introduction to fuzzy logic, fuzzy sets and operations with fuzzy sets, fuzzy inference, applications of fuzzy logic, with a focus on fuzzy logic inference circuits and their performance.

C-5-20: Multiprocessor Systems (Assoc.Prof. Dr.Eng. Marius MARCU)

This course presents the hardware architecture and specific elements used in multiprocessor servers. The course covers topics like SIMD, MIMD architectures, memory in multiprocessor servers, synchronization, interconnection networks, multiprocessor server performance, multiprocessor server sizing.

C-5-21: Optical Fiber Transmissions (Prof.Dr.Eng. Mircea STRATULAT)

Course contents: Optical Physics, Transmission through Optical Fibers, Types of Optical Fibers, Fiber Optics Transmitters, Fiber Optics Receivers, Fiber Optic Networks.

C-5-22: Software Verification and Validation (Assoc.Prof.Dr.Eng. Marius MINEA)

Present the theory and practice of ensuring correct and reliable software. Understand and apply testing techniques in various phases of the development process and complement them with static analysis and formal verification. Gain the ability to evaluate importance and limitations of the verification and validation process, to design and effective test plan, to use appropriate tools and to evaluate the possibilities of formalizing and automating testing in a project.

C-5-23: Computer Aided Integrated Production Systems (T.Assist.Dr.Eng. Constantin COSOVAN)

There are presented modern production systems based on the informational and communications

technologies that are computer aided with the adherent software. Integration is ensured by the informational system which shapes the modern reengineering architectures with a view to implement the optimum management strategy. The acquired knowledge enables the implementation of the entities required for the upgrading and computer processing of all the components of the production system; the conceiving, the design, the planning, the manufacture, the quality assurance, and the firm management.

C-5-24: Machine Learning (Prof.Dr.Eng. Marius CRI AN)

Upon completion of the course, students will have a broad understanding of machine learning algorithms and their use in data-driven knowledge discovery and program synthesis. Students will be able to identify, formulate and solve machine learning problems that arise in practical applications. Students will have knowledge of the strengths and weaknesses of different machine learning algorithms and be able to adapt or combine some of the key elements of existing machine learning algorithms to design new algorithms as needed.

C-5-25: Advanced Digital Signal Processing (Assoc.Prof.Dr.Eng. Mihai MICEA)

The course focuses on the advanced techniques and algorithms used in digital signal processing. Students will learn the main design and analysis techniques of advanced types of digital filters such as: efficient FIR and IIR filters, adaptive filters, linear prediction and optimum filters. Students will also gain abilities of designing and implementing advanced digital signal processing algorithms and systems using generic and specialized digital devices (Digital Signal Processors – DSPs).

C-5-26: Hardware-Software Co-Design (Prof.Dr.Eng. Mircea VL DU IU)

This course tackles the fundamental principles of embedded applications design. Unlike the very complex universal computing systems, the embedded systems design can be performed at both hardware and software levels, at the same time. Therefore, this discipline includes the broad area of aspects which are encompassed by the hardware/software design process: hardware component specification models, instruction sets, reconfigurable computing, heterogeneous computer architectures, system-on-chip, code generators and compiling, system level design.

C-5-27: Graphics Processing Systems (T.Assist.Eng. Sorin BABII)

The course will introduce the student to the advanced techniques for generating realistic images. The course will discuss several methods and algorithms and how they can be applied for various purposes, including: hidden surfaces, Z-buffer, color models, illuminating, ray-tracing, radiosity, computer animation.

First Year of Study (Master, ACS)

ACS-1-01: Embedded Systems (Prof.Dr.Eng. Mircea POPA)

The goal of the discipline is to give an overview and also specific knowledge about the Embedded Systems. The following topics are addressed, regarding the Embedded Systems: design requirements, typical structure, hardware design, interrupts, software design (programming language, architectural framework, applicative program), real-time operating systems, testing and debugging, memory management, low power concept and communications between microcontrollers.

ACS-1-02: Mobile Communication Systems (Assoc.Prof. Dr.Eng. Doru TODINC)

The goals of the course are to give an overview of mobile communication systems, with an emphasis on mobile data networks.

ACS-1-03: Advanced Artificial Intelligence and Cognitive Models (Prof.Dr.Eng. Mircea CRI AN)

The course starts with a review of the theory and practice of the most advanced strategies in AI and how to utilize the various techniques in knowledge-based systems. Then, the cognitive processes (perception, memory, language and thought) are investigated. Finally, the main research approaches are presented that may lead to valid cognitive models, suitable for various applications. Upon completion of this course students will be able to provide solutions for solving real human-like problems and develop their own research approaches.

ACS-1-04: Formal Verification (Assoc.Prof. Dr.Eng. Marius MINEA)

Understand the foundations of formal methods and their applicability, be able to model and specify systems formally, use existing languages and tools for modeling, analysis and verification, gain insight into current research. Evaluate the applicability of formal techniques in the verification and validation process, choose and apply appropriate methods and tools.

ACS-1-05: Distributed Systems Design (Prof.Dr.Eng. Ioan JURCA)

This course presents the main theoretical principles underlying the distributed systems, as well as different paradigms used in organizing actual distributed systems. By the end of the course students should be able to analyze and understand various examples of distributed systems, and to find an appropriate paradigm for the architecture of a complex distributed application.

ACS-1-06: Emerging Technologies (Prof.Dr.Eng. Mircea VL DU IU)

The benefits brought by the new computing technologies are thoroughly explained in this course, along with the difficulties encountered in implementing them. The advent of the first commercial quantum computer (built by D-Wave

systems, and presented in the 13th of February 2007) has transformed quantum computation into a trend of paramount importance within the emerging computing technology field. This discipline presents the fundamental features that are making quantum computation able to solve efficiently problems that have inefficient solutions on a classical computer.

ACS-1-07: Software Project Management (Prof.Dr.Eng. Vladimir CRE U)

The course has as main objective to offer required knowledge and skills for managing software projects. Methods, technologies and specific techniques for software project management are presented. Main topics: SPM definition, objectives, processes, activities, tasks, software developing process, project life cycles, management process); Technologies for SW products development; SW Project Management Fundamentals; SW Size Estimation Methods; SW Costs Estimation Methods; Cost Estimation Models; Parametric Models; The Project Plan; Planning Tools; Acceptance Criteria; The Design Phase.

ACS-1-08: Heuristic Methods (Prof.Dr.Eng. Horia CIOCÂRLIE)

The course presents a class of algorithms that are useful in solving a great variety of programming problems and make a evaluation of efficiency and performance of these algorithms. Thus, the following methods will be presented: the advanced methods of algorithm design, the dynamic programming, the heuristic exploration algorithms, the approximation algorithms, the simulated Annealing, the Tabu Search and the Genetic Algorithms.

ACS-1-09: Software Quality Assurance (Assoc.Prof.Dr.Eng. Radu MARINESCU)

The main objective of the course is to familiarize the students with modern evaluation techniques of software systems, emphasizing on the quality of design and implementation, and approaching in detail the object-oriented software systems.

Second Year of Study (Master, ACS)

ACS-2-01: Component-Based Software Engineering (Assoc.Prof.Dr.Eng. Ioana ORA)

The goals of the course are to give an overview of component-based software engineering fundamentals and of the main component technologies. The main topics are: Motivation and concepts of component based software engineering; Definition and specification of components; Component models and software architecture; Software reuse and component based software engineering

ACS-2-03: Data Mining (Prof.Dr.Eng. tefan HOLBAN)

Data mining is a combination of database and artificial intelligence technologies. This course provides the opportunity to learn research skills, practice data structures, and enhance the understanding of

algorithms. It is accessible to students with no prerequisites beyond the traditional data structures course, and allows them to experience both applied and theoretical work in a discipline that straddles multiple areas of computer science. Fundamentally, data mining does two things with data: it finds relationships and makes prototypes.

ACS-2-04: Real-Time UML (Prof.Dr.Eng. Vladimir CRE U)

The course has as main objective to introduce the object-oriented analysis and the design for hard real-time systems using the UML. For these purposes, an object-oriented development approach for real-time systems is introduced as well as the real-time UML. In the last part of the course de MARTE (Modeling and Analysis of Real-Time and Embedded systems) OMG Methodology is presented.

ACS-2-05: Hardware-Software Codesign (Prof.Dr.Eng. Mircea VL DU IU)

This course tackles the fundamental principles of embedded applications design. Unlike the very complex universal computing systems, the embedded systems design can be performed at both hardware and software levels, at the same time. Therefore, this discipline includes the broad area of aspects which are encompassed by the hardware/software design process: hardware component specification models, instruction sets, reconfigurable computing, heterogeneous computer architectures, system-on-chip, code generators and compiling, system level design.

3.2.C.3 Syllabus of the Courses Taught by Staff of the Other Departments

First Year of Study (CTI)

CTI-1-01: Mathematical Analysis (Prof.Dr. Octavian LIPOVAN)

The course provides a theoretical introduction and solutions to typical problems in Differential Calculus and Multiple Integrals. The main objectives are to consolidate the student's knowledge of the following concepts: convergence, limit, continuity, differentiability, partial derivatives, Taylor's and Laurent's series expansion, local extrema and Riemann integrability. The students will gain abilities to encompass the fundamental elements of mathematical reasoning, to distinguish between different levels of abstraction, and a coherent capacity of reasoning based on a sequence of logical deductions.

CTI-1-02: Algebra and Geometry (Assoc.Prof.Dr. Dorina -Marieta RENDI)

The objective of the course is to give a theoretical introduction and solutions to typical problems in Algebra and Geometry, such as: linear spaces and subspaces, basis and dimension of a linear spaces, linear mappings, matrix of a linear mapping, eigenvalues and eigenvector, diagonal form of a matrix, quadratic forms and the canonical form, Euclidean linear spaces, ortogonal bases, orthogonal and simetric transformations, affine spaces, the straight line and the plane, conix and quadrix, differential geometry of curves and surfaces.

CTI-1-03: Physics (Lect. Ioan LUMINOSU)

The objective of the course is to teach the students the basic notions in physics that will allow them to have a better understanding of the physical effects bound to be encountered during their professional life, including: Mechanics (conservation laws), Oscillations (free, damped and forced oscillations), Waves (waves phenomena), Electromagnetism, Quantum mechanics, and Solid state physics

(electrical, magnetic and optical properties). The students should be able to use the appropriate theoretical tools to estimate the consequences of the different effects.

CTI-1-08: Culture and Civilization (T.Assist. Viorel SÎRBU)

Integration of Romania into the European Union requires knowledge on various aspects regarding the contemporary European culture and civilization. The course has as main objective to familiarize the students with the European culture and civilization, as well as with the history of the European Union.

CTI-1-10: Computer-Assisted Mathematics (Assoc.Prof.Dr. Pavel N SL U)

The course focuses on the theoretical solutions for multiple integrals and differential equations, numerical approximation of curves, numerical calculus in integration, matrix and differential equations. The aim of the course is to provide grounding and skills in mathematics assisted by computer applications, particularly by MATLAB.

CTI-1-11: Special Mathematics (Probability and Statistics) (Prof.Dr. Emilia PETRI OR)

Course goals are to introduce the basic concepts of probability theory and statistical inference, with relevance for computer science and computer engineering applications. Topics include: discrete probability space, conditional probability, discrete and continuous random variables, simulation of random variables, finite state discrete time Markov chains, Poisson processes, statistical inference: point estimation, confidence intervals, hypothesis testing.

CTI-1-12: Fundamentals of Electrical Engineering (Prof.Dr.Eng. Dumitru RADU)

The main objectives of the course are to assimilate the basic knowledge of electrical circuits and electromagnetic field. The basic physical quantities, the main laws and theorems, and the analyzing

methods are presented. Linear and nonlinear d.c. circuits, sinusoidal steady-state linear circuits, and circuits in transient state are studied. Also static electric and magnetic fields, electromagnetic induction phenomenon and electromagnetic wave equations are analyzed.

CTI-1-13: Fundamentals of Electronic Engineering (Prof.Dr.Eng. Sabin IONEL)

The course presents in a pragmatic way several types of electronic devices along with their usage within fundamental analogue electronic circuits. Using simple engineering methods and computing approximations, the course develops the basic skills regarding the orders of magnitude. Practical experiments combined with the PSPICE analysis of circuits gain the necessary skills in computer-assisted electronic design. The students will also learn to write engineering reports with the results of measurements, experiments and simulations.

Second Year of Study (CTI)

CTI-2-01: Fundamentals of Mechanical Engineering and Robotics (Prof.Dr.Eng. Dorina DR GULESCU)

The main objective of the course is to familiarize the students with the mechanical engineering principles, linking its contents to the knowledge acquired in high school. The basic mechanical movements and their correlations will be analyzed, both from the cinematic and from the dynamics points of view. The study of body systems dynamics is further extended to robots as particular body systems.

CTI-2-04: Measurement Principles and Techniques (Prof.Dr.Eng. Alimpie IGNEA)

The main objectives of this course are: introduction to measurement techniques and metrology; presentation of the main measurement methods and principles in the electric domain and of the blocks specific to electronics instrumentation; electrical measurement of non-electrical values.

CTI-2-07: Communication (Prof.Dr. Georgeta CIOBANU)

This course focuses on providing the students the competences and skills needed for oral and written communication for professional purposes. The main objectives are: development of communicative skills for getting a job; development of optimization strategies for oral expressing and of the team communication skills; development of the skills for correct writing in the future fields of activity.

CTI-2-10: Micro-Economy (Assoc.Prof.Dr. Septimiu POP)

The main objectives of the course are to provide the basic knowledge of the micro-economy theory in contemporary market economy and of the operating principles of the functional market mechanisms.

CTI-2-13: System Theory and Automatics (Prof.Dr.Eng. Toma-Leonida DRAGOMIR)

The objectives of the course are: Assimilation of terminology and basic systemic concepts; Knowledge of main models of linear, non-linear, continuous and discrete time systems; Assimilation of characterization elements of systems in time and complex frequency domains; Using of stability, controllability and observability analysis techniques for linear systems. The competencies created by the course are: Generating interpretation, design and research skills by using knowledge from other fundamental courses for modeling and analysis of physical systems.

Third Year of Study (C)

C-3-01: Economy 1 (Assoc.Prof.Dr. Septimiu POP)

The main objective of this course is to provide information and knowledge concerning the basics in economy for engineering students. The curricula includes titles such as: the system of the socio-economic activities, the contemporary market, the economic agents, the production factors, price and market mechanisms, competition, supply and demand, money and inflation. All of these concepts and mechanisms are taught so that they can be applicable under the conditions of the existing economy system in Romania.

C-3-07: System Theory 2 (Prof.Dr.Eng. Toma-Leonida DRAGOMIR)

The objectives of the course are: Knowledge and using of terminology and basic concepts regarding non-linear systems; Knowledge and handling of stability analysis techniques for non-linear systems. The competencies created by the course are: Generating interpretation, design and research skills for physical systems described by nonlinear models, and analyzing of some problems regarding the structure of control systems.

C-3-09: Economy 2 (Lect.Dr. Eugenia GRECU)

The course of Finances of trading companies offers information about the patrimonial and financial structure of enterprises, as well as the existing possibilities for a financial equilibrium and the share capital growth. Also, it analyses the enterprises possibilities to be financed by bond loans, banking credit, leasing. The risk, investment decisions, taxes and synthesis documents for trading companies activities are some of the other topics the students have the possibility to study when taking this course.

C-3-18: Industrial Robot Dynamics (Prof.Dr.Eng. Doina DR GULESCU)

The course focuses on creating the applicative basis necessary for programming and control techniques to be approached by the students during next years of study. The students will also gain skills of working with real-life autonomous systems with the prospects of using automatic-feedback and fuzzy control

systems involving mechanical movements, dynamic behavior and movement control.

C-3-19: System Identification (Prof.Dr.Eng. Octavian PRO TEAN)

The aim of the course is to provide the knowledge necessary for the mathematical modeling and parameter estimation of the systems from experimental data. There are presented classical methods of identification: impulse, step and sine-wave testing, identification techniques based on correlation function, the fundamental concepts and major results of parameter estimation theory, mean-square and minimum variance methods, predictor error methods, instrumental variable methods, and maximum likelihood methods - off-line and on-line way manner.

Fourth Year of Study (C)

C-4-01: Management (Assoc.Prof.Dr.Eng. Gabriela PRO TEAN)

The course will involve the students in a demanding process of personal and managerial development, learning to enhance individual managerial understanding and effectiveness and as well to work relationships with a diverse group of colleagues. The discipline curricula include the concept of management, the scientific, human and quantitative approach, and the steps in creating a company, alternatives of businesses. The five functions of management (forecast/planning, organizing, ordering, leading and controlling) are presented in the context of nowadays realities.

C-4-12: Marketing (Prof.Dr.Eng. Anghel T ROAT)

The main objective of Marketing discipline is to provide knowledge about principles, techniques and specific models of marketing, as much to the conceptual level and to the level of them application in the real conditions of market. The discipline curricula include: the concept of marketing, the stages of marketing evolution in the market economy, the marketing-mix, the management of marketing. The marketing curricula also include: the information systems for market research and de marketing strategic planning.

C-4-23: Professional Communication (Prof.Dr. Georgeta CIOBANU)

The course of Professional Communication aims at developing skills and abilities of oral and written communication for the present and future professional activity of control engineering students. The courses and seminars include: activities to develop and improve communicative skills in applying for a job, strategies to improve in-company oral and written skills for various communication situations, skills of managing technical documentation.

C-4-24: CASE Tools (Assoc.Prof.Dr.Eng. Ioan FILIP)

The course presents basic issues of software engineering and a set of software tools used to manage the configuration of the software projects, project versioning, fault reports management, automated testing: Clearcase, CVS - Concurrent Versioning System, WinRunner, ARTS. Also there are presented the formal language SDL and the related tool GEODE.

3.2.1 Informatics Section (3 years)

3.2.1.1 Curricula

First Year of Study						
Nr. "xx"	Course Name (Code: "IF-1-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Mathematical Analysis	5	28	28	–	–
02	Algebra and Geometry	5	28	28	–	–
03	Introduction to Computer Programming	5	28	–	28	–
04	Logic and Discrete Structures	4	28	28	–	–
05	Computer Fundamentals	4	28	–	28	–
06	Culture and Civilization	2	14	14	–	–
07	International Languages 1	2	–	28	–	–
08	Sports 1	1	–	28	–	–
09	Applied Activities (45 hours)	2	–	–	–	–
10	Special Mathematics	4	28	28	–	–
11	Computer assisted mathematics	4	28	–	28	–
12	Programming Techniques	5	28	–	28	–
13	Data Structures and Algorithms	5	28	–	14	–
14	Computer Architecture	5	28	–	28	–
15	Microeconomics	2	28	28	–	–
16	International Languages 2	2	–	28	–	–
17	Sports 2	1	–	28	–	–
18	Applied Activities (45 hours)	2	–	–	–	–

3.2.1.2 Syllabus of the Courses Taught by the Faculty Staff

First Year of Study (IF)

IF-1-03: Introduction to Computer Programming (Prof.Dr.Eng. L cr mioara STOICU TIVADAR)

Objective: Study of fundamentals of programming, computer science and information technology.
 Contents: general presentation of computers (hardware, software, software engineering, applied informatics), fundamentals of computer networks, Internet, WWW, basics of C language (structure of a program, variables, constants), expressions, operators, standard types, standard functions, statements (compound, association, selection, iteration), functions, structured types (arrays, string, structures).

IF-1-04: Logic and Discrete Structures (Prof.Dr.Eng. Marius CRI AN)

The course deals with objects such as integers, propositions, sets, relations and functions, which are all discrete. The course starts introducing sets, operations on sets, and properties of set operations. Then, graphs and trees, functions, and relations are studied. Finally, propositional calculus, first-order predicate calculus and computational logic are introduced. At the end of this course students should be able understand concepts associated with discrete objects, their properties, and relationships among them and others. Students will obtain skills in discrete

structures and logic, used in the study and practice of computer science.

IF-1-05: Computer Fundamentals (Prof.Dr.Eng. Mircea VLADU IU)

Course contents: Digital Concepts (Positional Number Systems: Decimal, Binary, Hexadecimal, Base r; Number System Conversion; Binary Codes: signed numbers, signed-magnitude, complement codes, BCD codes; Binary arithmetic), Boolean Switching Algebra (Binary Logic, Switching Algebra, Reduction of Switching Equations, Combinational Logic Principles (Canonical Forms, Switching Equations, Truth Tables, Karnaugh maps, Quine-McClusky Minimization, Map-Entered Variables, Mixed Logic Combinational Circuits), Analysis and Design of Combinational Logic (Decoders/encoders, Adders/subtractors, Binary comparators, Tristate Buffers, Logic Hazards), Sequential Logic (Flip-flops, Timing Specifications, Counters and Registers), Programmable Logic Devices.

IF-1-11: Computer Assisted Mathematics (Prof.Dr.Eng. Radu-Emil PRECUP)

Notions of error theory; elements of numerical matrix calculus; numerical solving of linear algebraic equations; numerical computation of eigenvalues and eigenvectors; numerical solving of nonlinear algebraic equations and systems; approximation of functions,

curves and surfaces; numerical solving of ordinary differential equations and systems; optimization problems in automation and informatics.

IF-1-12: Programming Techniques (Prof.Dr.Eng. Horia CIOCĂRLIE)

Course contents: Advanced data structures. Hierarchic organization of subprograms. Parameters functions. Designing large programs. Step Wise Refinement method. Recurrent functions. Dynamic data structures. Pointers. Dynamic memory allocation. Lists and queues. General algorithm design methods. Greedy, Backtracking, Divide and Conquer. Files. Sorting techniques. Program modularity. Abstract data types. Stacks. Introduction to Unix.

IF-1-13: Data Structures and Algorithms (Lect.Dr.Eng. Dorina PETRIC)

Fundamental concepts regarding the data structure and structured programming. Fundamental data types and structured data types. Notions about algorithms. Analysis of the algorithms with asymptotic notations. Sorting techniques. (direct and advanced, internal and

external). Analysis of sorting algorithms. Array as abstract data type: implementation, searching techniques. Lists: definition of the abstract data type list, implementation techniques, applications. Trees: definition of the abstract data type tree, traversal of trees, specific operators. Binary and ordered trees.

IF-1-14: Computer Architecture (Prof.Dr.Eng. Nicolae ROBU)

Overview on computer architecture. Memories: definition and unit design. Ports: standard input and output ports. Numbers representation: fixed point and floating point (IEEE 754). Arithmetic-Logic Unit: adder, multiplier and divider devices. The registry unit: case studies including the stack implementation and presentation. The command unit: the von Neumann paradigm and the architectural components of a von Neumann command unit, with case studies; instruction coding, including addressing modes; instruction implementation, with examples. Presentation of the waiting mechanism, the bus giving up mechanism and the interruption mechanism.

3.2.1.3 Syllabus of the Courses Taught by Staff of the Other Faculties or Departments

First Year of Study (IF)

IF-1-01: Mathematical Analysis (Prof.Dr. Octavian LIPOVAN)

The course provides a theoretical introduction and solutions to typical problems in Differential Calculus and Multiple Integrals. The main objectives are to consolidate the student's knowledge of the following concepts: convergence, limit, continuity, differentiability, partial derivatives, Taylor's and Laurent's series expansion, local extrema and Riemann integrability. The students will gain abilities to encompass the fundamental elements of mathematical reasoning, to distinguish between different levels of abstraction, and a coherent capacity of reasoning based on a sequence of logical deductions.

IF-1-02: Algebra and Geometry (Assoc.Prof.Dr. Dorina -Marieta RENDI)

The objective of the course is to give a theoretical introduction and solutions to typical problems in Algebra and Geometry, such as: linear spaces and subspaces, basis and dimension of a linear spaces, linear mappings, matrix of a linear mapping, eigenvalues and eigenvector, diagonal form of a matrix, quadratic forms and the canonical form, Euclidean linear spaces, orthogonal bases, orthogonal and symmetric transformations, affine spaces, the straight line and the plane, conix and quadrix, differential geometry of curves and surfaces.

IF-1-06: Culture and civilization (T.Assist. Viorel SÎRBU)

The aim of the course is to provide grounding in the European civilization and culture as well as the history

of the European Union. Course contents: introductory elements of culture and civilization, the main European treaties, the institutional structure of the European Union, common and specific elements at European countries, European values and symbols, the future of the European Union, Romania and the European Union.

IF-1-10: Special Mathematics (Probability and Statistics) (Prof.Dr. Emilia PETRI OR)

Course goals: to introduce basic concepts of probability theory and statistical inference relevant for computer science and computer engineering applications. Topics include: discrete probability space, conditional probability, discrete and continuous random variables, simulation of random variables, finite state discrete time Markov chains, Poisson processes, statistical inference: point estimation, confidence intervals, hypothesis testing.

IF-1-15: Microeconomics (Assoc.Prof.Dr. Septimiu POP)

Objective: Study of fundamentals of basic theory of microeconomics and contemporary market economy. Contents: general presentation of microeconomics, the contemporary market economy, economic agents, production factors, economic competition, offer and demand, money, income, profit, production costs.

3.2.S Master Specialization: Automotive Embedded Software (2 years, in collaboration with Siemens VDO)

3.2.S.1 Curricula

First Year of Study						
Nr. "xx"	Course Name (Code: "AES-1-xx")	Credits	Total Hours			
			Course	Seminar	Laboratory	Project
01	Embedded Systems 1	10	28	–	14	–
02	Software Project Management	10	28	–	14	–
03	Software Engineering	10	28	–	14	–
04	Embedded Systems 2	8	42	–	21	–
05	Communication Skills	7	–	–	–	–
06	Basic Application Know-How	8	21	–	–	21
07	Intelligent Control in Automotive Embedded Systems	7	28	–	14	–

3.2.S.2 Syllabus of the Courses Taught by the Faculty Staff

First Year of Study (AES)

AES-1-02: Software Project Management (Prof.Dr.Eng. Vladimit CRE U)

The main objective of the course is to provide the knowledge and usage of project management methods and technologies. Content: Introduction, Technologies for SW products development SW Project Management, (Fundamentals, SW Size Estimation Methods, SW Costs Estimation Methods, Cost Estimation Models, The Project Plan, Acceptance Criteria), The Design Phase (The Design Specification, Design Guidelines, Design tools), The Programming Phase (Conventional Organization, Team Organization, Programming Tools, Management Activities during Programming Phase), System Test Phase, The Acceptance Phase, The Installation and Operation Phase, Special Considerations, Case Study, A Project Plan Outline.

AES-1-03: Software Engineering (Prof.Dr.Eng. Vasile STOICU-TIVADAR)

Objective: to provide knowledge and practical skills about software development life cycle, objectives, principles and techniques, with emphasis on real-time systems, embedded systems and object-oriented technologies.

Content: Definition, objectives and principles, the software lyfe cycle, software development configuration management, real-time UML, Testing.

AES-1-04: Embedded Systems 2 (Prof.Dr.Eng. Nicolae ROBU)

The course presents: An introduction to Embedded Systems; Processes, Tasks, Threads, Multitasking, Multithreading, Multitasking with Multithreading Notions; Context Switching and Tasks Scheduling; Synchronization Problems and Afferent Mechanisms; Interrupt Handling; Choosing an RTOS; An Embedded Oriented Real-Time Operating System — OSEK: Architecture, Tasks Management, Interrupts Processing, Events Mechanism, Resources Management, Alarms.

AES-1-07: Intelligent Control in Automotive Embedded Systems (Prof.Dr.Eng. Radu-Emil PRECUP)

Control problems in automotive embedded systems including motion control. Introduction to soft computing; soft computing constituents and conventional artificial intelligence. Fuzzy sets and fuzzy information processing. Structures of fuzzy control systems and fuzzy inference systems. Typical and special fuzzy controllers. Basics of neural networks; architectures; learning and adaptation. Neuro-fuzzy Systems; adaptive hybrid neuro-fuzzy control systems; adaptive neuro-fuzzy inference systems; ANFIS. Derivative-free optimization in intelligent control systems; genetic algorithms; simulated annealing; random search; downhill simplex search.

3.2.S.3 Syllabus of the Courses Taught by Staff of the Other Faculties or Departments

AES-1-01: Embedded Systems 1 (Prof.Dr.Eng. Virgil TIPONU)

Course contents: Structures and general characteristics of an “embedded” system. Microarchitectures for numerical processing. Interfaces and standard buses used in automotive field. General therns regarding

real time “embedded” operating systems. Sensors and transducers used in automotive field.

AES-1-05: Communications Skills (Assoc.Prof.Dr.Eng. Gabriela PRO TEAN)

"Communication skills" provide one of the most important adeptness in life. The discipline curricula

include skills for developing a center of security, guidance, wisdom and power in behavior, skills in thinking “win to win” solutions, principles of personal management, skills in listening/understanding and then to be understood, principles of empathic communication, principles of creative cooperation (synergies).

AES-1-06: Basic Application Know-How (Eng. Alina ILIN)

The course objective is to develop basic skills for managing and organizing a project. The course

provides an overview about basic methods and techniques applied during the whole project lifecycle, from project initiation to project closure, with special emphasis on project monitoring and controlling, risk management, stakeholder analysis, decision analysis and resolution, quality management and continuous process improvement. All the methods and concepts presented will be supported by examples from real projects.

3.3 Complementary Courses Offered by the Department for Training of Teaching Personnel

3.3.1 About the Department

The Department for Training the Didactic Personnel is a didactic and scientific research structure of the University in which provides the specific training for the students and for the higher technique education graduates, who choose the didactic profession and also to perfecting of the specialty training, psycho-pedagogy and methods for didactic workers from the pre-university and university education.

The mission of the Department consists of creating some activities of higher education and pedagogical research which:

- Give an answer to the aspirations of the student's and graduates who choose the didactic profession;
- Meet the continuous training and career evolution requirements expressed by the engineer teachers from the pre-university technique education;
- Provide a permanent pedagogical perfecting for the entire didactic personnel of the “Polytechnic” University of Timisoara.

Attributions: Conceived as a specialized structure for the pedagogical training of future didactic workers, the Department has the following attributions:

- The unitary coordination of the activity concerning the conception, the content and methodology specific for the didactic worker training, reflected in the education plans, in the analytic programs and in the class didactic activities, seminary and pedagogical practice, according to the modern standards of the profession;
- The implementation of education modernizing solutions and of it's reform support, as well as the direct transfer of information and experience between the university didactic workers in the Department's structure and the teachers from the application schools where the students are doing the pedagogical practice;
- Organizing the perfecting special, psycho-pedagogical and methodical training activities for the pre-university didactic workers, including organizing the exams to finalize in education and obtaining the didactic grades II and I, according to the methodology of the Education and Research Ministry;
- Promoting the fundamental and applied scientific research in the field, for publications, research contracts, counseling, scientific sessions, elaborating courses, manuals, didactic guides etc.

3.3.2 Department Staff and Curricula

Staff Name	Curricula		
	Course Name	Year of Study	Semester
Lect.Dr. Crisanta – Alina MAZILESCU T.Assist. Adela Ionela DINU	Education psychology	I	1
Lect.Dr. Gabriel – Mugurel DRAGOMIR T.Assist. Liliana TODORESCU	Pedagogy	II	1 and 2
Prof.Dr.Eng. Stefan PREITL	The Didactic of the Specialty	III	1
Lect.Dr. Crisanta – Alina MAZILESCU T.Assist. Liliana TODORESCU	Educational Communication	III	2
Lect.Dr. Gabriel – Mugurel DRAGOMIR T.Assist. Monica POPESCU-MITROI	The Sociology of Education	IV	1

3.3.3 Syllabus of the Courses Taught by the Department Staff

Education Psychology

The course wants to describe behavior manifestations and psychological dynamics met in the educational system, in the teaching-learning process. Mostly, it is pursued the understanding of the individual and age specific periods psychological profile, to facilitate the communication of the educative content and the obtaining of good performances, in the context of skills and competences that are being formed. The course contains theoretical and practical elements, being realized through dissertations, discussions, structural exercises and role plays. The students prepare here materials which are discussed in the seminary and actively participate in the exercises.

Pedagogy

Pedagogy, provides the students with the possibility of forming a real image about:

- What mean the components of the instructive-educative process (principles, finalities, contents, organization forms, the instructing methodology, means, evaluation, the didactic activities projecting);
- The adaptation of some behavior and professional intervention ways concerning the “education” activity of pupils, having as a landmark an integral (holistic) conception regarding education.

Pedagogy approach the educative process, no matter where the educative action takes place, no matter it's institutionalized or not institutionalized character.

The Didactic of the Specialty

The teaching mode is an art in which the teacher is a good creator, a good actor, but also a good manager of the learning process. The vertiginous growth in the volume of knowledge that needs to be considered in the education process implies the continuous perfecting of teaching methodologies.

With all the modern means that education posses, the lesson remains for teachers and students, the organized environment of efficient dialogue.

The engineer-teacher needs to consider that the technical information is accumulated in variable

rythms, meanwhile the assimilation and memory fixing capacities, at the individual level are limited.

Therefore modern didactic puts an accent on the forming character of the teaching. In the specialty teaching methodic are answered questions like: “what?”, “how much?” and “how?” the knowledge to be taught more efficiently.

Pedagogical Practice

Forming for the didactic profession includes besides the theoretic component also a practical one with formative valence: forming some abilities and competences specific for the didactic job through experiencing the teaching practice.

The pedagogical practice offers the students the possibility to experiment the professor role, teaching, evaluating and being examined in the same time. The objectives:

- Forming students' capacities to operate with information from the educational sciences' field;
- The general knowledge of the school reality;
- The orientation in the analytical programs and school manuals;
- The accumulation of some abilities specific to the didactic profession;
- The knowledge and interpretation of information about the pupils and the class of pupils.

Educational Communication

As an integrant part of the human communication and, in the same time, distinct domain of activity, Educational communication has as a goal to make an incursion in the pre-university and university educational field in order to identify the means of communication and the existent interpersonal relationships between the educational actors.

The making of this incursion requires the reference of some communication elements that suit to the educational space: verbal, nonverbal, Para-verbal language, notion about listening, negotiation, argumentation, interaction, conflict solving, the communicational between individuals and group communication, communication structures and

networks and not the least methods and techniques of written and oral communication.

The Sociology of Education

The sociological approach of the educational system has led to the consecration of a specialized discipline, which is called "The sociology of education". In the domain of social pedagogy there is even a tradition, through the work called "The sociology of education". Even though there existed some kind of preoccupations in this field from the manifestation of this discipline as a science, we dare to say that the

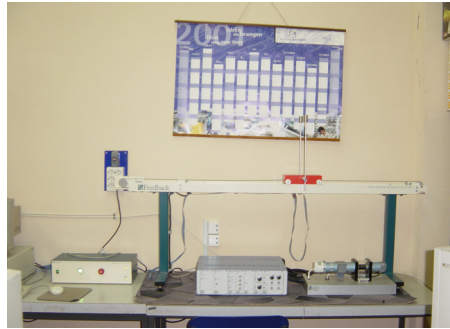
sociology of education hasn't yet, evidently, come out of the "creation book".

Referring to what we want to achieve in the next pages, we emphasize the fact that, on one hand we will keep in mind the nature of the orientations in this domain, and on the other hand we will try to disclose the problematic content kept in mind. In this last direction, there will be aimed problems like: educational styles in the contemporary family, education and frustration, educational space and juvenile delinquency.

4 Research and Development Activity

4.1 Faculty Research Centers

4.1.A Research Division in Automation and Industrial Informatics



Director: Prof.Dr.Eng. Radu-Emil PRECUP
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Domain: Engineering Sciences – Systems Engineering

Main Research Areas:

- Process Control
- System Identification and Adaptive Systems
- Applied Informatics
- Real-Time Control Systems

4.1.A.1 Research Group in Process Control

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Research Team: Prof.Dr.Eng. Radu-Emil PRECUP, T.Assist.Eng. Levente KOVACS, T.Assist.Eng. Zsuzsa PREITL, T.Assist.Eng. Simona GHEJU

Research Fields: Control systems with conventional controllers; Advanced control systems

Keywords: Fuzzy logic control; sliding mode control; intelligent systems; 2-DOF control; stability analysis; sensitivity analysis; mobile robots; servo systems; embedded systems.

Main Activities: Development of conventional and advanced control systems; Development of adaptive control systems; Soft computing in industrial applications; Development of control systems for servo systems; Development of control systems for mobile robots.

Published Papers:

- [1] Precup, R.-E., Preitl, St., *Stability and Sensitivity Analysis of Fuzzy Control Systems. Mechatronics Applications*, Acta Polytechnica Hungarica, Budapest Tech Polytechnical Institution, Budapest (Hungary), ISSN 1785-8860, vol. 3, no. 1, 2006, pp. 61–76
- [2] Precup, R.-E., Preitl, St., *PI and PID Controllers Tuning for Integral-type Servo Systems to Ensure Robust Stability and Controller Robustness*, Electrical Engineering (Archiv für Elektrotechnik), Springer-Verlag, ISSN 0948-7921, vol. 88, no. 2, 2006, pp. 149–156
- [3] Preitl, Zs., Precup, R.-E., Tar, J. K., Takács, M., *Use of Multi-parametric Quadratic Programming in Fuzzy Control Systems*, Acta Polytechnica Hungarica, Budapest Tech Polytechnical Institution, Budapest (Hungary), ISSN 1785-8860, vol. 3, no. 3, 2006, pp. 29–43
- [4] Preitl, St., Precup, R.-E., Fodor, J., Bede, B., *Iterative Feedback Tuning in Fuzzy Control Systems. Theory and Applications*, Acta Polytechnica Hungarica, Budapest Tech Polytechnical Institution, Budapest (Hungary), ISSN 1785-8860, vol. 3, no. 3, 2006, pp. 81–96
- [5] Precup, R.-E., Preitl, St., *On a Class of Control Systems with Takagi-Sugeno PI-Fuzzy Controllers*, Studies in Informatics and Control, National Institute for R&D in Informatics ICI Bucharest, ISSN 1220-1766, vol. 15, no. 3, 2006, pp. 323–332
- [6] Tar, J. K., Rudas, I. J., Preitl, St., Precup, R.-E., *Robust, Potential Limited Control for an Indirectly Driven Saturated System*, Buletinul Științific al Universității “Politehnica” din Timișoara, Transactions on Automatic Control and Computer Science, Editura Politehnica, Timișoara, ISSN 1224-600X, vol. 51 (65), no. 1, 2006, pp. 25–30
- [7] Tar, J. K., Bito, J. F., Preitl, St., Precup, R.-E., *Two Degree of Freedom Takagi-Sugeno Fuzzy Controllers in Trajectory Tracking*, 15th International Workshop on Robotics in Alpe-Adria-Danube Region RAAD 2006, Balatonfüred (Hungary), Proceedings, ISBN 963-7154-48-5, 2006, CD-ROM, paper index 5, 6 pages
- [8] Preitl, St., Precup, R.-E., *Experiments in Fuzzy Control of a Class of Servo Systems for Mobile Robots*, 15th Intl. Wshop. on Robotics in Alpe-Adria-Danube Region RAAD 2006, Balatonfüred (Hungary), Proceedings, ISBN 963-7154-48-5, 2006, CD-ROM, paper index 51, 7 pg.
- [9] Precup, R.-E., Preitl, St., Preitl, Zs., *Fuzzy Control Solution for a Class of Tricycle Mobile Robots*, 3rd IEEE International Conference on Mechatronics ICM 2006, Budapest (Hungary), Proceedings, ISBN 1-4244-9713-4, 2006, CD-ROM, paper index BPA_037, pp. 208–213
- [10] Precup, R.-E., Preitl, St., *A Genetic Iterative Feedback Tuning (GIFT) Method for Fuzzy Control System Development*, 2006 International Symposium on Evolving Fuzzy Systems, Ambleside, Lake District (UK), Proceedings, ISBN 0-7803-9719-3, 2006, pp. 144–149
- [11] Precup, R.-E., Preitl, St., *Low Cost Fuzzy Controlled Servo Systems in Mechatronic Systems*, 4th IFAC Symposium on Mechatronic Systems MECHATRONICS 2006, Heidelberg (Germany), Preprints, 2006, CD-ROM, paper index 40, pp. 247–252
- [12] Precup, R.-E., Preitl, St., *Development Method for Low Cost Fuzzy Controlled Servosystems*, 2006 IEEE International Symposium on Intelligent Control ISIC, Munchen (Germany), Proceedings, 2006, CD-ROM, paper index 125, pp. 2707–2712
- [13] Precup, R.-E., Preitl, St., Rudas, I. J., Tar, J. K., *On the Use of Iterative Learning Control in Fuzzy Control System Structures*, 7th Intl. Symp. of Hungarian Researchers on Computational Intelligence, Budapest (Hungary), Proceedings, ISBN 963-7154-54-X, 2006, pp. 69–82
- [14] Precup, R.-E., Preitl, St., Ardelean, C., *On a Two-Degree-of-Freedom Iterative Feedback Tuning Approach*, 7th International Conference on Technical Informatics CONTI'2006, Timișoara, Proceedings, ISBN 973-625-320-1, 2006, vol. 1, pp. 19–24
- [15] Gaudia, A., Korondi, P., Preitl, St., Precup, R.-E., *Recognizing Unusual Behaviour in Distributed Environment*, 7th International Conference on Technical Informatics CONTI'2006, Timișoara, editors: O. Proștean, St. Preitl, M. Crișan, R.-E. Precup, D. Andreescu, D. Pescaru, M. Stratulat, Proceedings, ISBN 973-625-320-1, 2006, vol. 1, pp. 55–60

Research Grants and Contracts:

- [1] Bilateral research contract, 2006-2007, between *Politehnica* University of Timisoara (P.U.T.) Romania and *Budapest Tech* Polytechnical Institution (B.M.F.), Hungary; Theme: *Analysis and development of Intelligent Systems*; Directors Prof. Dr. Eng. Ștefan PREITL (P.U.T., Romanian partner) and Prof. Dr. Janos FODOR (B.M.F., Hungarian partner) (*The Agreement of the Third Romanian-Hungarian Session of Scientific and Technologic Co-operation, signed in Budapest, nov. 2005, Appendix II, crt.nb. 35 ID nb.17*)
- [2] Research Grant of National University Research Council (CNCSIS), Type A, no. 2739 / 2006, CNCSIS code 366, Title: *Development of new fuzzy controller structures for embedded systems using Iterative Feedback Tuning algorithms*. Director: Prof.dr.eng. Radu-Emil Precup (grant value for 2006: 29,400 RON)

Perspective Domains: New methods for the algorithmic design of conventional and intelligent controllers (fuzzy, neural, genetic, sliding mode); Methods for computer-aided design of control systems; Analysis and development of Intelligent Systems; Control solutions in the fields of power systems, electrical drives, general industrial automation, mobile robots

Strategic Priorities: Control systems ensuring low sensitivity; Tools for computer-aided design of 2-DOF controllers; Computer-aided techniques in Iterative Feedback Tuning and Iterative Learning Control; Low cost solutions for control problems dedicated to mobile robots; Methods and tools to enable the systematic development of fuzzy control systems.

4.1.A.2 Research Group in System Identification and Adaptive Systems

Director: Prof.Dr.Eng. Octavian PROȘTEAN
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Research Team: Prof.Dr.Eng. Nicolae BUDIȘAN, Assoc.Prof.Dr.Eng. Ioan FILIP, T.Assist.Eng. Iosif SZEIDERT, T.Assist.Eng. Cristian VAȘAR

Research Fields: System's modeling, identification and simulation; Unconventional energetic; Neural networks and fuzzy systems; Adaptive control systems.

Keywords: Modeling, identification and simulation of systems, neural networks and fuzzy systems, wind energy conversion systems, unconventional energetic, adaptive control, self-tuning

Main Activities: Modeling, simulation and development of wind energy conversion systems (WECS); Identification and parameter estimation of electrical machines (asynchronous and synchronous); Development of new enhanced electrical machines types; Development of control systems for WECS; Control software development in industrial applications; Modeling and simulation of systems with neural networks; Development of WECS software; Development of adaptive control structures; Development of data acquisition systems.

Published Papers:

- [1] Filip, I., Prostean, O., Szeidert, I., Balas, V., Prostean, G., Comparative Study Regarding an Adaptive Fuzzy Controller and a Self-Tuning Controller with Application to the Excitation Control of a Synchronous Generator, WSEAS Transaction on Systems, Issue 7, Vol.5, July 2006, ISSN1109-2777, pp. 1587-1692.

- [2] Filip, I., Prostean, O., Szeidert, I., Prostean, G., Vasar, C., *Self-tuning Control Using External Integrator Loop for a Synchronous Generator Excitation System*, 11th IEEE International Conference on Emerging Technologies and Factory Automation, ETFA2006, Prague September 20-22, 2006, IEEE Catalog Number: 06TH8897C, ISBN: 1-4244-0681-1, Library of Congress: 006927951, pp. 997-1000
- [3] Szeidert, I., Prostean, O., Filip, I., Vasar, C., *Above Flux Estimation Issues in Induction Generators with Application at Energy Conversion Systems*, Acta Polytechnica Hungarica, Journal of Applied Sciences, Volume 3, Issue Number 3, 2006, Special Issue on Applied Computational Intelligence, ISSN 1785-8860, pp. 137-148
- [4] Filip, I., *Adaptive Self-Tuning Controllers Design based on Minimum Variance Strategies*, Scientific Buletin of "Politehnica" University of Timisoara, Vol. 51(65), 2006 No.3, ISSN 1224-600X, pp. 17-22
- [5] Filip, I., Prostean, O., Balas, V., Prostean, G., *Design and Simulation of a Neural Controller for Excitation Control of a Synchronous Generator*, Proceedings of the 6th International Conference on Recent Advances in Soft Computing (RASC 2006), Canterbury, United Kingdom, July 10-12, 2006, ISBN 978-1-902671-43-7, 1-902671-43-0, pp. 361-366
- [6] Filip, I., Prostean, O., Szeidert, I., Balas, V., Prostean, G., *Adaptive Fuzzy Controller and Adaptive Self-Tuning Controller: Comparative Analysis for the Excitation Control of a Synchronous Generator*, Proceedings of the 7th WSEAS International Conference on AUTOMATION & Information (ICAI'06), Cavtat, Croatia, June 12-15, 2006, CD-ROM, ISSN 1790-5109, ISBN 960-8457-46-7, pp.89-94
- [7] Prostean, G., Prostean, O., Szeidert, I., Filip, I., *Scheduling Intelligent System for Time Shortening*, Proceedings of the Management International Conference MIC 2006, Slovenia, ISBN 961-6573-43-8, ISSN 1854-4312, pp.1873- 1882
- [8] Prostean, O., Vasar, C., Szeidert, I., Filip, I., *Comparative Study Regarding Classic PI and Fuzzy Control Solutions Applied at Electrical Drives Equipped with Permanent Magnet Synchronous Machine*, Proceedings of the 7th International Conference on Technical Informatics (CONTI'2006), Timisoara, Romania, June 8-9, 2006, Vol.1, ISBN (10) 973-625-319-8, pp.51-54
- [9] Filip, I., Prostean, O., Vasar, C., Szeidert, I., *Adaptive Fuzzy Controller for Synchronous Generator*, SACI 2006, 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, Timisoara, Romania, May 25-26, 2006, ISBN: 963 7154 46 9, pp. 154-163
- [10] Szeidert, I., Prostean, O., Filip, I., Vasar, C., *Considerations regarding the flux estimation in induction generator with application at the control of unconventional energetic conversion systems*, SACI 2006, 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, Timisoara, Romania, May 25-26, 2006, ISBN: 963 7154 46 9 , pp. 77-86
- [11] Szeidert, I., *Comparative Study Regarding Control of Wind Energy Conversion Systems Based on the Usage of Classical and Adaptive Neuro Fuzzy Controllers*, SACI 2006, 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, Timisoara, Romania, May 25-26, 2006, ISBN: 963 7154 46 9 , pp. 614-620

Research Grants and Contracts:

- [1] National University Research Council CNCSIS, Romania, research grant "Researches regarding new electromechanical energy conversion automatic systems, with induction machines, with application to wind aggregates", Grant Type A, Theme no. 29, code 628, Contract no. 2738/19.05.2006, Director: Prof.dr.eng. Octavian Prostean, Financed value 16,000 RON
- [2] National University Research Council CNCSIS, Romania, research grant "Researches regarding the synthesis and implementation on digital signal processors of fuzzy control strategies with application to the excitation's command of synchronous generators", Grant Type A, theme no. 6, code 349, Director: Assoc. prof.dr.eng. Ioan Filip, Financed value 15,000 RON
- [3] National University Research Council CNCSIS, Romania, research grant "Researches regarding identification and control methods of systems with induction generators for ecological energetics resources", Grant Type TD, Theme no. 11, code 97, Contract no. 2739/19.05.2006, Director: Assist.Prof.eng. Iosif Szeidert, PhD student, Financed value 13,000 RON

Perspective Domains: Real time control of induction machines using LabView (LabWindowsCVI) using the National Instruments Data Acquisition Systems; Advanced control of wind aggregates; Neural network control systems.

Strategic Priorities: Study of innovative control systems for wind aggregates: improved adaptive step Hill climbing method (HCC); Tools for statistical wind measurement related data, for short-term forecasting used in wind speed prediction based windmill's control systems and for simulation of autonomous wind farms aggregates (new Matlab tools).

4.1.A.3 Research Group in Applied Informatics

Director: Prof.Dr.Eng. Vasile STOICU-TIVADAR
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 E-mail: vasile.stoicu-tivadar@aut.upt.ro

Research Team: Prof.Dr.Eng. Lăcrămioara STOICU-TIVADAR, Eng. Dorin BERIAN

Research Fields: Health Information Systems, E-Health, Telemedicine; Embedded and Real-time Systems; Distributed and Mobile Applications.

Keywords: Distributed medical informatics; applied informatics; telemedicine; e-administration

Main Activities: Implementation of a telemedicine application between the Timis County Hospital and Italian Hospitals; Improvement of a distributed document flow– based software for the Timis County Council administration; Development of mobile applications in medical informatics; Study and development of different solutions for integrated healthcare networks.

Published Papers:

- [1] Stoicu-Tivadar, V., Stoicu-Tivadar, L., Sicurello, F., Moga, V., Moga, M., Pellicanò, G., Ronco, G., *A bridge between projects: interoperability with General Practitioners and Hospitals*, Integrating Biomedical Information: From e-Cell to e-Patient. Proceedings of the EFMI STC, April 6-8 2006, Timisoara, Romania, IOS Press, ISBN 1-58603-614-9, pp. 64-68
- [2] Stoicu-Tivadar, L., Sicurello, F., Stoicu-Tivadar, V., Moga, V., Moga, M., Pellicano, G., Ronco, G., *Teleconsultations As A Step Towards Hospital Interoperability*, Studies in Health Technology and Informatics, Ubiquity: Technologies for Better Health in Aging Societies, IOS Press, Technology and Informatics, Vol. 124, 2006, ISBN I-58603-647-5, ISSN 0926-9630, pp. 455-460
- [3] Stoicu-Tivadar, L., Stoicu-Tivadar, V., *Human-Computer Interaction Reflected in the Design of User Interfaces for General Practitioners*, International Journal of Medical Informatics, Vol. 75 (3-4), march-april 2006, ISSN 1386-5056, pp. 335-342
- [4] Stoicu-Tivadar, V., *Genericity, and Customisation in a Lotus-based solution for communication between local public institutions*, Proceedings of SACI2006, 3^d Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, Timișoara-Budapesta, 2006, ISBN 963 7154 46 9, pp. 268-277

Research Grants and Contracts:

- [1] Bilateral project Italy-Romania: *System for teleconsultation between hospitals*. Participants: Francesco Sicurello (@ITIM Associazione Italiana di Telemedicina e Informatica Medica, University Milano-Bicocca), Lacramioara Stoicu-Tivadar (Politehnica University Timisoara), Vasile Stoicu-Tivadar (Politehnica University Timisoara), Gianni Pellicano (Hospital Careggi

- Florence), Victor Moga (County Hospital Timisoara), Mariana Moga (County Hospital Timisoara), Gianluca Ronco (Sirse Italy).
- [2] IBM Central/Eastern Europe, Middle East, and Africa (CEMA) Faculty Awards Cycle 3 Program, *A generic Lotus-based solution for communication between local public institutions*. Participants: Vasile Stoicu-Tivadar, Lacramioara Stoicu-Tivadar, Dorin Berian, Adriana Albu ("Politehnica" University Timișoara), Vajda Csaba (MD).

Perspective Domains: Distributed architectures and appropriate technological solutions; Mobile applications and related technologies; Interoperability standards in distributed medical informatics; Tools for statistical processing of the medical data and for rapid development of embedded applications; Solutions for integrated healthcare networks and interoperability and for e-administration (document flow and data collecting).

Strategic Priorities: The Education and Training of high level healthcare managers and policy makers on the strategic role of ICT in Healthcare and change management; To implement programmes on education and training, and other actions to promote awareness and to reduce resistance to change of healthcare professionals; To set up specific awareness actions addressing sensitive groups, such as: academic circles, high reputation specialists at university hospitals and other local medical opinion leaders, clinical research groups, medicine and nursing students; To improve mutual learning for the transferring part too, particularly to avoid cultural mismatches.

4.1.A.4 Research Group in Real-Time Control Systems

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Research Team: Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU, Prof.Dr.Eng. Toma-Leonida DRAGOMIR, Assoc.Prof.Dr.Eng. Ioan SILEA, Lect.Dr.Eng. Sorin NANU, T.Assist.Eng. Tiberiu IONICĂ, T.Assist.Eng. Ana-Maria DAN

Research Fields: Advanced Control of AC drives: Sensorless Control of IPMSM; Fault-tolerant Control; Applied Informatics; Solar Energy; Automotive Electric Actuation Technologies; Applications to Electric and Hybrid Vehicles.

Keywords: Sensorless direct torque and flux control; State and disturbance observers; Variable structure flux-observer, Fault-tolerance; Fuzzy-interpolating implementation, Signal injection; Real-time implementation; AC drives; Electric and hybrid vehicles (EHV)

Main Activities: Control systems in Automotive electric actuation technologies; Development of Sensorless control system from zero speed for starter-generator with IPMSM for EHV; Development of Integrated sensors of rotor position and speed based on signal injection for IPMSM drives; Wind power generator control; Real-time implementation and testing using dSpace for Sensorless control system of AC drives.

Published Papers:

- [1] Lascu, C., Andreescu, G.-D., Sliding-Mode Observer and Improved Integrator with DC-Offset Compensation for Flux Estimation in Sensorless Controlled Induction Motors, IEEE Transactions on Industrial Electronics, ISSN 0278-0046, vol. 53, no. 3, 2006, pp. 785-794.

- [2] Boldea, I., Pitic, C.I., Lascu, C., Andreescu, G.-D., Tutelea, L., Blaabjerg, F., Sandholdt, P., DTFC-SVM Motion-Sensorless Control of PM-Assisted Reluctance Synchronous Machine as Starter-Alternator for Hybrid Electric Vehicles, IEEE Transactions on Power Electronics, ISSN 0885-8993, vol. 21, no. 3, 2006, pp. 711-719.
- [3] Şerban, I., Andreescu, G.-D., Tutelea, L., Lascu, C., Blaabjerg, F., Boldea, I., New State Observers and Sensorless Control of Wound Rotor Induction Generator (WRIG) at Power Grid with Experimental Characterization, 32nd Annual Conference of the IEEE Industrial Electronics Society IECON 2006, Paris, France, Publisher: IEEE, Piscataway, NJ, USA, Proceedings, paper index PF-002356, 2006, 8 pag.
- [4] Şerban, I., Andreescu, G.-D., Lascu, C., Blaabjerg, F., Boldea, I., *Sensorless Wound-Rotor Induction Machine (WRIM): Dual-Converter Motoring Control with Short-Circuited Stator*, 10th International Conference on Optimization of Electrical and Electronic Equipment OPTIM 2006, Braşov, Editors: M. Cernat, A. Nicolaide, I. Mărgineanu, Transilvania University Press, Braşov, Proceedings, ISBN 973-635-704-X; 978-973-635-704-6, vol. 2, pp. 221-228.
- [5] Fătu, M., I., Boldea, Lascu, C., Tutelea, L., Andreescu, G.D., *Motion Sensorless Variable Speed PMSG Control at Power Grid*, Proc. of the 10th Intl. Conference on Optimization of Electrical and Electronic Equipment OPTIM 2006, Braşov, ISBN 973-635-705-8, vol. 3, pp. 9-16.
- [6] Coroban, V., Boldea, I., Andreescu, G.-D., Blaabjerg, F., *BEGA - Motor/Generator Vector Control for Wide Constant Power Speed Range*, 10th International Conference on Optimization of Electrical and Electronic Equipment OPTIM 2006, Braşov, Editors: M. Cernat, A. Nicolaide, I. Mărgineanu, Transilvania University Press, Braşov, Proceedings, ISBN 973-635-705-8; 978-973-635-705-3, vol. 3, pp. 79-86.
- [7] Silea, I., Petrica, D., *Distributed Informatic System for the Measurement and Control of Various Dangerous Gases Concentration*, Scientific Bulletin of "Politehnica" University, Transaction on Automatic Control and Computer Science, Vol. 51 (65), 2006, ISSN 1224-600X, pp. 65-70.
- [8] Silea, I., Petrica D., *Simulink Model for Switched Reluctance Motor Drives*, International Conference on Technical Informatics – CONTI'2006, Romania, Timisoara, June, pp. 201-2008.
- [9] Silea, I., Petrica D., *Aspects of TGS 813 gas sensor's use*, 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, Timisoara, Romania, May, pp. 192-203.
- [10] Silea, I., Luminosu, I., *Five Axis Machining Application with ALPHACAM*, Proceedings of the 50th ETRAN, International Conference, Belgrad (Yugoslavia), June 6-8, 2006, ISBN 86-80509-61-2, vol IV, pp. 261-264.

Research Grants and Contracts:

- [1] Research Grant of Excellence, Ministry of Education and Research, CEEEX: X2C33/2006, (within AMTRANS national research program): *Automotive Electric Actuation Technologies (AEAT)*, Director: Prof.dr.eng. I. Boldea, UPT Scientific coordinator at UPT partener: Prof.dr.eng. G.-D. Andreescu (2006 granted value for Dept. AIA: 41,700 RON)
- [2] Platform for study of phisycal, energetical, electrical, electronical and chemical concurent phenomena that occur in the thermo-solar conversion process and in the photo-voltaic effect. Automation of functioning and exploitation of solar assets based on thermo-solar and photo-voltaic conversion. – Director Prof. Dr. Eng. Nicolae ROBU (3000000 RON) MEC03/15.09.2006, Cod CNCSIS 38.
- [3] Research Grant of Excellence, Ministry of Education and Research, CEEEX: 138/03.10.2006: Collaborative network for the research of the ENVIRONMENTAL pollutants effects on health, inside complex meta-systems, Coordinator UPT Prof.Dr.Eng. Nicolae ROBU.

Perspective Domains: Automotive control; Advanced control of electric drives, Robotics; Real-time control using LabView (LabWindows CVI); Applications with FPGA using VHDL, Xilinx; Solar energy; Distributed data processing.

Strategic Priorities: Control of EHV and Automotive Electric Actuator Technologies; dSpace platform, LabView real-time platform; Advanced control of electric drives, Automotive, Robotics, Mechatronic systems, Applications with solar energy usage, Distributed data processing, Collaborations with the automotive industry.

4.1.C Research Center of Computer Science and Engineering and Information Technology (CC-SICTI-UPT)



Director: Prof.Dr.Eng. Vladimir CREȚU
"Politehnica" University of Timisoara
Faculty of Automation and Computers
Department of Computer and Software Engineering
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E-mail: vladimir.cretu@cs.upt.ro

Domain: Engineering Sciences – Computers and Information Technology

Main Research Areas:

- Computers Architecture, Bio-Inspired Computing, Computers Reliability, Quantum Calculus
- Software Engineering, Distributed Systems, Computing Systems Security
- Real-Time and Embedded Systems, Digital Signal Processing
- Databases, Artificial Intelligence
- Data Acquisition and Processing Systems for Electrical Machines and Equipments

4.1.C.1 Research Laboratory of Advanced Computer Systems and Architectures

Director: Prof.Dr.Eng. Mircea VLĂDUȚIU
"Politehnica" University of Timisoara
Faculty of Automation and Computers
Department of Computer and Software Engineering
2, Vasile Parvan Blvd., 300223, Timisoara, Romania
Tel: +40 256 403258, Fax: +40 256 403214
E-mail: mircea.vladutiu@cs.upt.ro

Setup Date: 1982

Research Team: Lect.Dr.Eng. Lucian PRODAN, Lect.Dr.Eng. Mihai UDRESCU, T.Assist.Eng. Versavia ANCUȘA

Research Objectives: Fundamental researches in computer testing, reliability, fault tolerant structures as well as in the direction of development of non-conventional architectures and bio-inspired design of the application on re-configurable platforms

Published Papers:

- [1] Marcu M., Vladutiu M., Moldovan H., Microprocessor Thermal Characterization using Thermal Benchmark Software, WSEAS Transactions on Computers, Issue 11, Vol. 5, Nov. 2006, pp. 2628-2633, ISSN 1109-2750.
- [2] Marcu M., Vladutiu M., Moldovan H., *Microprocessor Thermal Benchmark*, Proceedings of the 10th WSEAS International Conference on Computers, WSEAS 2006, Athens, Greece, Jul. 2006, pp. 1220-1223, ISBN 960-8457-47-5.
- [3] Marcu M., Vladutiu M., *Realistic Resistive Bridging Faults Simulation Using SPICE Models*, The 15th IEEE North Atlantic Test Workshop, NATW 2006, The Inn at Essex, USA, May 2006, pp. 204-209.
- [4] Marcu M., Vladutiu M., *Two-Values Fault Coverage Definition for Realistic Resistive Bridging Faults Simulation*, Proceedings of the 7th International Conference on Technical Informatics, CONTI2006, Timisoara, Romania, Jun. 2006, pp. 131-136, ISBN (10) 973-625-321-X, (13) 978-973-625-321-8.
- [5] Marcu M., Vladutiu M., Fuicu S., *Fault Selection Pseudo-Genetic Algorithm for Fault Coverage Interval Estimation*, Proceedings of the 7th International Conference on Technical Informatics, CONTI2006, Timisoara, Romania, Jun. 2006, pp. 127-130, ISBN (10) 973-625-321-X, (13) 978-973-625-321-8.
- [6] Marcu M., Vladutiu M., Moldovan H., Popa M., *“Thermal Benchmark and Power Benchmark Software”*, International Workshops on THERMal Investigations of ICs and Systems (THERMINIC 2006), Nice, France, September 27-29, 2006, pp. 203-208, ISBN 2-916187-0409.
- [7] Prodan L., Udrescu M., Vladutiu M., *A Dependability Perspective on Emerging Technologies*, Proceedings 3rd ACM International Conference on Computing Frontiers (CF'06), Ischia, Italy, May 2 - 5 2006, pp. 187-198.
- [8] Udrescu M., Prodan L., Vladutiu M., *Implementing Quantum Genetic Algorithms: A Solution Based on Grover's Algorithm*, Proceedings 3rd ACM International Conference on Computing Frontiers (CF'06), Ischia, Italy, May 2 - 5 2006, pp. 71-82.

4.1.C.2 Research Laboratory of Databases and Artificial Intelligence**Directors:** Prof.Dr.Eng. Ștefan HOLBAN

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 Faculty of Automation and Computers
 Department of Computer and Software Engineering
 2, Vasile Parvan Blvd., 300223, Timisoara, Romania
 E-mail: stefan.holban@cs.upt.ro

Prof.Dr.Eng. Ionel JIAN
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 Faculty of Automation and Computers
 Department of Computer and Software Engineering
 2, Vasile Parvan Blvd., 300223, Timisoara, Romania
 E-mail: ionel.jian@cs.upt.ro

Setup Date: 1975**Research Team:** Prof.Dr.Eng. Marius CRIȘAN, Assoc.Prof.Dr.Eng. Dan PESCARU, T.Assist.Eng. Sorin SERĂU, T.Assist.Eng. Cosmin CERNĂZEANU, PhD.Stud. Dan CIREȘAN**Research Objectives:** Fundamental researches in distributed databases, artificial intelligence, simulation and modeling, cognitive systems, intelligent agents for e-learning applications, development of video surveillance applications based on wireless sensor networks technology

Published Papers:

- [1] Zafiu A., Stefanescu I., Holban St., Franti E., *An algorithm to determine the multivalued implicant vectors with a guaranteed minimum number of specified entries*, WSEAS Transaction on Computers Research Issue 2, Volume 1, December 2006, ISSN 1991-8755 pp. 272-278.
- [2] Tundrea E., Lahire P., Pescaru D., Chirila C.B., *SmartFactory - A Prototype for Model Oriented Software Engineering Based on Eclipse Platform*, In Proceedings of International Conference on Technical Informatics - CONTI'2006, ISBN 978-973-625-319-5, vol. 2, pp. 71-76, Timisoara, Romania, June 8-9, 2006.
- [3] Tundrea E., Lahire P., Pescaru D., Chirila C.B., *SmartModels - A Framework For Generating On-Line Learning Software Solutions*, In Proceedings of the 12th International Conference Netties 2006 ISBN (10): 973-638-262-1 ISBN (13): 978-973-638-262-8, Orizonturi Universitare, pp. 69-75, Timisoara, Romania, September 6-9, 2006.
- [4] Tundrea E., Pescaru D., Chirila C.B., *SmartModels. A Model Oriented Approach Validated by a Prototype Based on Eclipse Platform*, 2006 IEEE-TTTC International Conference on Automation, Quality&Testing, Robotics AQTR 2006, Cluj, Romania, May 25-28 2006.
- [5] Cosma M., Pescaru D., Ciubotaru B., Todinca D., *Routing and Topology Extraction Protocol for a Wireless Sensor Network using Video Information*, the 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence (SACI'06), Timisoara, Romania, May 25-26 2006.
- [6] Chirila C.B., Ruzsilla Monica, Crescenzo P., Lahire P., Pescaru D., Tundrea E., *Towards a Reengineering Tool for Java based on Reverse Inheritance*, the 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence (SACI'06), Timisoara, Romania, May 25-26 2006.
- [7] Ciresan D., Pescaru D., *Using Character Moment Based Invariant Features to Improve Off-Line Handwriting Recognition*, The 8th International Conference on Development and Application Systems DAS'06, Suceava, Romania, 25 - 27 May, 2006.
- [8] Pescaru D., Fuiorea D., Gui V., Toma C., Gabriel-Miro Muntean, A. Doboli, *Image-based Node Localization Algorithm for Wireless Video Sensor Networks*, IT&T Conference 2006, Carlow, Ireland, ISSN 1649-1246, pp. 139-148, 25-26 October 2006.
- [9] Fuiorea D., Pescaru D., Gui V., Toma C., *Feature Based 2D Image Registration Using Mean Shift Parameter Estimation*, Scientific Bulletin of Politehnica University of Timisoara, Transactions on Electronics and Communications, Vol. 51(65) no2/2006, ISSN 1583-3380, pp. 77-80, Timisoara, September 2006.
- [10] Crisan M., *Meaning as Cognition*, Proceedings of the I International Conference on Multidisciplinary Information Sciences and Technologies-InSciT'2006, Merida, Spain, ISBN-10 Vol. II: 84-611-3105-3, pp.369-373.
- [11] Crisan M., *Information Machine and the Gödelian Case*, Sci. Bulletin of "Politehnica" University of Timisoara, Transactions on AC and COMPUTER SCIENCE, Vol. 51 (65) No.4, 2006, pp. 45-50.
- [12] Crisan M., *Meaning as Differentiated-Cognition*, Proceedings of the 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence - SACI'2006, Timisoara, pp. 602-613.
- [13] Crisan, M., *Upon the Gödelian Argument*, Proceedings of the 7th International Conference on Technical Informatics-CONTI'2006, Timisoara, Vol. 2, pp. 179-182.

Research Grants and Contracts:

- [1] *Bio-View – Program set for simulation of biological processes with dedicated interface*, VIASAN Program, Interdisciplinary Subprogram #4, PED project, 2006, 20.000 RON, Director: Stefan HOLBAN.
- [2] *Integrated informatic system for complex evaluation of risk and quality prediction factors in obstetrics*, CEEEX-INFOSOC 99/31.07.2006, 17000 RON, Director: Stefan HOLBAN.
- [3] *Platform for video surveillance applications based on wireless sensor networks technology*, CNCSIS MEc No. 2739/2006 22.500 RON/2006, Director: Dan PESCARU.
- [4] *Intelligent anticipatory agent oriented on decision and e-learning applications*, CNCSIS grant No. 346/3/2006, 15400 RON, Director: Marius CRIȘAN.

4.1.C.3 Research Laboratory of Software Engineering

Director: Prof.Dr.Eng. Ioan JURCA
"Politehnica" University of Timisoara
Faculty of Automation and Computers
Department of Computer and Software Engineering
2, Vasile Parvan Blvd., 300223, Timisoara, Romania
E-mail: ioan.jurca@cs.upt.ro

Setup Date: 1978

Research Team: Assoc.Prof.Dr.Eng. Marius MINEA, Assoc.Prof.Dr.Eng. Radu MARINESCU, T.Assist.Eng. Cristina MARINESCU, T.Assist.Eng. Adrian MIERLUȚIU, T.Assist.Eng. Petru MIHANEA, T.Assist.Eng. Dan COSMA, T.Assist.Eng. Ciprian CHIRILĂ

Research Objectives: Development of Integrated Evolving Environments for Software System Analysis

Published Books:

- [1] Clarke, E., Minea, M., Tiplea, F.L., *Verification of Infinite-State Systems with Applications to Security*, (Volume 1 in NATO Security through Science Series: Information and Communication Security) IOS Press, Jan. 2006, ISBN: 1-58603-570-3, 244p.
- [2] Marinescu Cristina, Mihancea P. F., *Programare Orientata pe Obiecte in Limbajul Java (Object-oriented programming in Java)*, Ed. Politehnica Timisoara, 2006. 200 pages, ISBN (10) 973-625-306-6, (13)978-973-625-306-5.

Published Papers:

- [1] Marinescu Cristina, Jurca I., *A Meta-Model for Enterprise Applications*, 8th International Symposium on Symbolic and Numeric Algorithms for Scientific Computation, SYNASC 2006, Timisoara, Romania, IEEE Computer Society Press.
- [2] Marinescu Cristina, *Quality Assessment of Enterprise Software Systems*, 13th Working Conference on Reverse Engineering (WCRE 2006, Benevento, Italy), Doctoral Symposium Section, IEEE Computer Society Press, ISBN:0-7695-2719-1, 309-310.
- [3] Marinescu Cristina, *Identification of Design Roles for the Assessment of Design Quality in Enterprise Applications*, 14th International Conference on Program Comprehension (ICPC 2006, Atena, Grecia), IEEE Computer Society Press, ISBN:0-7695-2601-2, pp.169-178.
- [4] Mihancea P. F., *Towards a Client Driven Characterization of Class Hierarchies*, Proceedings of the 14th IEEE International Conference on Program Comprehension (ICPC 2006), pp. 285-294, ISBN 0-7695-2601-2, IEEE Computer Society Press, Atena, 2006.

Research Grants and Contracts:

- [1] *Research and training in software testing, verification and validation*, contract with Oce Software SRL, No. 479/27.06.2006, 19500 RON, Director: Marius MINEA.
- [2] *Quality evaluation in distributed software systems*, CNCSIS TD grant No. 58GR/2006, Director: Cristina MARINESCU.
- [3] *Methods for analysis the relations between the architectural components in OCE applications*, Contract with Oce Software SRL, No.197/22.02.2006, Director: Cristina MARINESCU.

4.1.C.4 Research Laboratory of Real-Time and Embedded Systems and Digital Signal Processing

Director: Prof.Dr.Eng. Vladimir CREȚU
"Politehnica" University of Timisoara
Faculty of Automation and Computers
Department of Computer and Software Engineering
2, Vasile Parvan Blvd., 300223, Timisoara, Romania
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Setup Date: 1976

Research Team: Prof.Dr.Eng. Mircea STRATULAT, Prof.Dr.Eng. Mircea POPA, Prof.Dr.Eng. Horia CIOCĂRLIE, Assoc.Prof.Dr.Eng. Mihai V. MICEA, Assoc.Prof.Dr.Eng. Marius MARCU, Assoc.Prof.Dr.Eng. Ioana ȘORA, Lect.Dr.Eng. Doru TODINCĂ, T.Assist.Eng. Călin JEBELEAN, T.Assist.Eng. Răzvan CIOARGĂ, T.Assist.Eng. Bogdan CIUBOTARU

Research Objectives: Fundamental and applied researches in the domain of real-time and embedded systems, design and implementation of hard real-time systems and executives, as well as digital signal processing applications, methods, techniques and structures for development of real-time embedded applications, integration of applications using grid technology and services oriented software architectures

Published Books:

- [1] Cretu, V., *Structuri de date și algoritmi : Curs pentru invatamant deschis la distanta (Data structures and algorithms : Course for online education)*, 186 pages, UPT Publ. Center, 2006
- [2] Ciocărlie H., *Universul limbajelor de programare (The Universe of Programming Languages)*, Ed. Orizonturi Universitare, Timișoara, 2006, 203 pages, ISBN (10) 973-638-246-X, ISBN (13) 978-973-638-246-8.
- [3] Ciocărlie H., *Programarea sistemelor distribuite în limbajele orientate pe obiecte. Prelucrarea grafică paralelă și distribuită pe structura grid a datelor geografice și de mediu (Distributed Systems Programming in Object-Oriented Languages. Distributed and Parallel Graphic Processing on Grid Structure of Environmental Geographical Data)*, First volume of MADIOGRID workgroup, Technical University Cluj-Napoca, 8-9 Dec. 2005, Ed. MEDIAMIRA, Cluj-Napoca, 2006, vol. 1, pp. 117-122, ISBN (10) 973-713-091-X, ISBN (13) 978-973-713-091-4.
- [4] Ciocărlie H., *Limbaje orientate pe obiecte destinate programării sistemelor distribuite, Prelucrarea grafică paralelă și distribuită pe structura grid a datelor geografice și de mediu (Object-Oriented Languages for Distributed Systems Programming. Distributed and Parallel Graphic Processing on Grid Structure of Environmental Geographical Data)*, First volume of MADIOGRID workgroup, Technical University Cluj-Napoca, 8-9 Dec. 2005, Ed. MEDIAMIRA, Cluj-Napoca, 2006, vol. 2, pp. 188-195, ISBN (10) 973-713-092-8, ISBN (13) 978-973-7132-1.
- [5] Marcu M., *Studiul fenomenelor termice la sistemele de calcul*, Ed. Orizonturi Universitare, Timisoara, 2006, ISBN (10) 973-638-277-X, (13) 978-973-638-277-2, 260 pages.

Published Papers:

- [1] Micea, M., Cretu, V., Groza V., *Maximum Predictability in Signal Interactions with the HARETICK Kernel*, IEEE Transactions on Instrumentation & Measurement, August 2006, Vol.55, Nr.4, IEIMAO, ISSN 0018-9456, pp.(1317-1330).
- [2] Muscalagiu I., Cretu V., *Improving the Performances of Asynchronous algorithms by combining the nogood processors with no good learning techniques*, Informatica, Vol. 17, No.1, 2006, ISSN 0868-4952, pp. 39-54.

- [3] Bocan V., Cretu V., *Mitigating Denial of Service Threats in GSM Networks*, Proceedings of ARES 2006, The First International Conference on Availability, Reliability and Security, Vienna 2006, pp.523-528.
- [4] Muscalagiu I., Cretu V., Popa E., *Messsage Management in the Case of AWACS Family Techniques*, Proceedings of the &-th International Conference on Tehcnical Informatics – Conti'2006, Vol.2, Computer and Software Engineering, Timisoara 2006, pp.(215- 220).
- [5] Mihai Fagadar-Cosma M., Fanicu L. D., Micea M., *Data Routing and Remote Protocol Analysis using the TETHRA System*, in Proceedings of the 32-nd Annual Conference of the IEEE Industrial Electronics Society, IECON'06, Paris, France, Nov. 2006, pp. (603-608), ISBN 1-4244-0136-4.
- [6] Cioarga R. D., Micea M., Ciubotaru B., Chiuciudean D., Stanescu Daniela, *CORE-TX: Collective Robotic Environment - the Timisoara Experiment*, Proceedings of the 3-rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, SACI'2006, Timisoara, Romania, May 2006, pp. 495-506, ISBN 963-7154-46-9.
- [7] Tudor D., Crețu V., Ciocârlie H., *Parallel Branch and Bound Experiment Using Java Based Message Passing and Shared Object Space Solutions*, CONTI 2006, Proceedings of 7th International Conference on Technical Informatics, Faculty of Automation and Computers, "Politehnica" University of Timisoara, Romania, pp. 161-166, vol. 2, ISBN (10) 973-625-321-X, (13) 978-973-625-8.
- [8] Șebu Laura, Ciocârlie H., *The Design of Stateful Web Services based on Web Service Resource Framework implemented in Globus Toolkit 4*, SYNASC 2006, 8th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, West University of Timisoara, Romania, September 22th-29th. 2006, pp. 63-70, IeAT Technical Report 06-07.
- [9] Barna C., Stratulat M., *Assistant Software for Alarm Systems*, Proceedings of the 6th International Conference on Recent Advances in Soft Computing (RASC 2006), Canterbury, United Kingdom, 10-12 July 2006, Ed.K.Sirlantzs, pp. 465-470, ISBN: 978-1-902671-43-7, 1-902671-43-0,
- [10] Barna C., Stratulat M., *A Localization Method for Based on Infrared Detectors for Surveillance Areas*, IEEE VECIMS 2006, Coruna, Spania, pp. 49-52, ISBN: 1-4244-0243-3.
- [11] Novak A., Stratulat M., *MP3 Player with Hard Disk and FM Stereo Radio Transmitter*, Proceeding of 7th International Conference on Technical Informatics - CONTI'2006, vol. 2 Computer and Software Engineering, 8-9 June, Timisoara, Romania, pp. 117-122, ISBN (10) 973-625-321-X (vol.2), (13) 978-973-625-321-8, (10) 973-625-319-8, (13) 978 973-625-319-5.
- [12] Novak A., Stratulat M., Stanescu Daniela, Chiciudean D., Ciubotaru B., Cioarga R., *Multimedia Streaming of MP3 Audio Content Based on FM Stereo Radio Transmitter*, Proceeding of 3th Romanian- Hungarian Joint Symposium on Applied Computational Intelligence, Timisoara, Romania, May 25-26, 2006, pp. 408-418, ISBN: 963 7154-46-9.
- [13] Novak A., Stratulat M., Stanescu Daniela, Chiciudean D., Ciubotaru B., Cioarga R., *Research and Development Platform for Multimedia Streaming of MP3 Audio Content*, Acta Polytechnica Hungaria, Journal of Applied Sciences at Budapest Tech Hungary, volume 3, Issue # 3, 2006, ISSN 1785-8860, pp. 5-17.
- [14] Popa M., Popa Anca Sorana, Ciocarlie H., *Software Interface for Pocket PC Based Mobile Telephony*, Proceedings of the 4th WSEAS International Conference on Electromagnetics, Wireless and Optical Communications, Venice, Italy, November 20-22, 2006, pp. 163-168, ISBN 960-8457-56-4.
- [15] Popa M., Popa Anca Sorana, Cretu V., Micea M., *Monitoring Serial Communications in Microcontroller Based Embedded Systems*, Proceedings of the 2006 IEEE International Conference on Computer Engineering & Systems (ICCES'06), Cairo, EGYPT, November 5 – 7, 2006, pp. 56-61, ISBN 1-4244-0272-7.
- [16] Popa, M., Popa, A.S., Cretu, V., Micea, M., *Centralized Management System for Mobile Communications with Pocket PCs*, CISSE 06, The 2nd IEEE International Joint Conferences on Computer, Information, and System Sciences, and Engineering, Bridgeport, USA December 4–14, 2006. [in print at Springer Verlag].
- [17] Popa M., Ciocarlie H., Botas Alina, Vasile M., *Testing and Monitoring Tools for Serial Transfers in Embedded Systems*, Proceedings of the Fifth International Symposium on

- Communication Systems, Networks and Digital Signal Processing (CSNDSP 2006), Patras, Greece, July 19 – 21, 2006, pp 744 – 747, ISBN 960-89282-0-6.
- [18] Popa M., Groza V., Botas Alina, *LIN Bus Testing Software*, Proceedings of the 2006 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2006), Ottawa, Canada, May 7 – 10, pp. 1390-1393, ISBN 1-4244-0038-4, ISSN 0840-7789, 2006.
- [19] Popa M., Ionel R., Groza V., Marcu M., *Educational Virtual Instrumentation Application for System Identification*, Proceeding of the 23rd IEEE Instrumentation and Measurement Technology Conference, Sorrento, Italy, April 24 – 27, pp. 842-846, ISBN 0-7803-9360-0, 2006
- [20] Ionel R., Popa M., *Internet and LAN Connected Embedded Virtual Instrumentation*, Proceedings of CONTI '2006, The 7th International Conference on Technical Informatics, Timisoara, Romania, June 8 – 9 2006, Vol. 2, pp. 113 – 116, ISBN (10) 973-625-321-X, (13) 978-973-625-321-8.
- [21] Popa M., Vasile M., Fuicu S., *Serial Bus Monitoring Software for Microcontrollers Embedded in Mechatronic Systems*, Proceedings of SACI 2006, The 3rd Romanian – Hungarian Joint Symposium on Applied Computational Intelligence, Timisoara, Romania, May 25 – 26 2006, pp. 396 – 407, ISBN 963 7154 46 9.
- [22] Popa M., Macrea M., Mihiu L., *Reverse Engineering Analyze for Microcontroller's Assembly Language Projects*, in Advances in Systems, Computing Sciences and Software Engineering, Proceedings of CISSE 05, 2006, The IEEE International Joint Conferences on Computer, Information, and System Sciences, and Engineering, December 10 – 20, Bridgeport, USA, 2005, pp. 333-338, Springer - Verlag, ISBN 1 – 4020 – 5262 – 6.
- [23] Marcu M., Fuicu S., *Wireless Local Positioning Systems: Issues and Challenges*, Proceedings of the 2nd IEEE International Conference on Intelligent Computer Communication and Processing, ICCP 2006, vol. 2, Cluj, Romania, Sep. 2006, pp. 181-186, ISBN (10) 973-662-235-5.
- [24] Marcu M., Fuicu S., Tomescu V., Zilahi M., Szasz A., Szilard C., Ilea C., *Smart Mobile Distributed Solution for Traffic Flow Optimization*, Proceedings of the 7th International Conference on Technical Informatics, CONTI2006, Timisoara, Romania, Jun. 2006, pp. 107-112, ISBN (10) 973-625-321-X, (13) 978-973-625-321-8.
- [25] Fuicu S., Anton A., Marcu M., *Experimental Measurements into TCP Congestion Mechanism over a Wireless 802.11 Network*, Proceedings of the 7th International Conference on Technical Informatics, CONTI2006, Timisoara, Romania, Jun. 2006, pp. 317-322, ISBN (10) 973-625-321-X, (13) 978-973-625-321-8.

Research Grants and Contracts:

- [1] Real-time systems embedded in complex applications of distributed artificial perception, collaborative robotized environments and intelligent sensor networks, Mihai V. Micea (director grant), Research Grant of Excellence, CEEX-ET-07/2006-2008, MEEdC - UEFISCSU, Contract No.1437/28/2006, 126000 RON. Director: Mihai Micea, Collaborators: Ioana Sora, Dan Chiciudean, Razvan Cioarga, Bogdan Ciubotaru.
- [2] *Requirement Control System*, Disertation Research Project for Fraunhofer Institute of Manufacturing Engineering and Automation (IPA) Stuttgart, Germany, Director: Vladimir Cretu.
- [3] *Modeling, design and development of real-time systems for critical embedded applications of signal acquisition, processing and digital control*, CNCSIS grant 717/2005-7, Theme 7/2005, 20.995 RON, Director: Vladimir Cretu.
- [4] *Mediogrid: Distributed and Parallel Graphic Processing on Grid Structure of Environmental Geographical Data*, Subcontract 19-CEEX-I03-128/07.10.2005, 140135 RON, Vladimir Cretu, (Director), Collaborator: Horia Ciocârlie.
- [5] Programming milieu for developing real-time distributed applications for embedded systems), CNCSIS grant No. 58GR/19.05.2006, 24000 RON/2006, Director: Horia Ciocârlie
- [6] Fatigue behaviour study and modeling of steel and aluminium load-bearing structures used in transportations, in case of random testing, CNCSIS grant No. GR226/14.09.2006, 25000 RON/2006, Collaborator: Horia Ciocârlie.

- [7] Design and implementation of a scalable dedicated system for wireless message communication with many mobile receivers located in a limited area – contract with S.C Luxten-AEM Timisoara, 6613.5 lei Director: Mircea Popa.
- [8] *Methods for temperature and power reducing in mobile embedded systems*, grant CNCSIS 2738/19.05.2006, grant CNCSIS. Director: Marius Marcu, Collaborator: Sebastian Fuicu.
- [9] *Software application for IP communication monitoring in the GSM B10 system*, contract No. 505/05.01.2006 with Alcatel Timisoara, Director: Marius Marcu, Collaborator: Sebastian Fuicu.
- [10] *Ethereal plugins set for IP protocols monitoring in the GSM B10 system*, contract No. 504/03.04.2006 with Alcatel Timisoara Director: Sebastian Fuicu, Collaborator: Marius Marcu.

4.1.C.5 Research Laboratory of Electrical Machine and Equipment Testing Using Digital Signal Acquisition and Processing Systems

Directors: Acad. Toma DORDEA

"Politehnica" University of Timisoara
 Faculty of Electrical Engineering
 2, Vasile Parvan Blvd., 300223, Timisoara, Romania
 E-mail: toma.dordea@et.upt.ro

Prof.Dr.Eng. Marius BIRIESCU
 "Politehnica" University of Timisoara
 Faculty of Electrical Engineering
 2, Vasile Parvan Blvd., 300223, Timisoara, Romania
 E-mail: marius.biriescu@et.upt.ro

Setup Date: 1987

Research Team: Eng. Gheorghe MĂDESCU, Eng. Marțian MOȚ

Research Objectives: Researches regarding elaboration of testing procedures and dedicated software for electrical machines, in accordance with European standards and methods, modeling, design and development of real-time applications in the domains of acquisition, processing and embedded digital control

4.2 Autonomous Research Groups

4.2.A Department of Automation and Applied Informatics

4.2.A.1 Research Group in Applied Systems Theory

Director: Prof.Dr.Eng. Toma-Leonida DRAGOMIR
 "Politehnica" University of Timisoara
 Faculty of Automation and Computers
 Department of Automation and Applied Informatics
 2, Vasile Parvan Blvd., 300223, Timisoara, Romania
 Tel: +40 256 403222, Fax: +40 256 403214
 E-mail: toma.dragomir@aut.upt.ro

Research Team: Assoc.Prof.Dr.Eng. Constantin VOLOȘENCU; Lect.Dr.Eng. Dorina POPESCU; Lect.Dr.Eng. Sorin NANU; T.Assist.Eng. Ana Maria DAN; Eng. Adrian KORODI

Research Fields: System theory applications in fault detection and diagnosis; System analysis using sensitivities; Development of control system devices; Fuzzy and neural systems; Virtual

instrumentation in control; Control of electrical drives; Management of the innovation and creativeness.

Keywords: Fault detection, identification and diagnosis, modeling, system safety and availability, controller design, process control, interpolating strategies, fuzzy logic, neural networks, control of electrical drives, virtual instruments.

Published Books:

- [1] Popescu, D., *Introduction in the Sensitivity Theory of Dynamical Systems*, Universitaria Publishing House, Craiova, 2005(6), ISBN 973-742-292-9, 174 pages, in romanian
- [2] Dragomir, T.L., *System Theory - Applications 2*, Politehnica Publishing House, 2006, ISBN 973-625-233-7, 204 pages, second edition.

Published Papers:

- [1] Gabor, G., Korodi, A., Dragomir, T.L. *Increasing Availability for Vaporizers Temperature Stabilization of a Geothermal Power Plant*, Proceedings of the 7th International Conf. on Technical Informatics – CONTI'2006, Vol. 1, Automation and Applied Informatics, Timisoara, June 2006. ISBN (10) 973 625 320-1, ISBN (13) 978 973 625 320-1, pp.25-30
- [2] Groza B., Dragomir T.L., Petrica D., *Using the Discrete Squaring Function in the Delayed Message Authentication Protocol*, International Conference on Internet Surveillance and Protection, ICISP '06, France, 26-28 Aug., 2006, IEEE Computer Society Press, IEEE Computer Society Order Number E2649, ISBN 0-7695-2649-7, CD-ROM.
- [3] Korodi, A., Dragomir, T.L., Gabor, G., *Temperature Control Solution Using Interpolation for a Geothermal Power Plant*, IFAC WS ESC'06, ENERGY SAVING CONTROL IN PLANTS AND BUILDINGS, October 2-5, 2006 Bansko, Bulgaria, , ISBN - 10: 954-9641-47-3, ISBN - 13: 978-954-9641-47-9, pp. 235-240
- [4] Korodi A., *Interpolative Fault Tolerant Controller for a Mobile Robot*, The 12th IEEE International Conference on Methods and Models in Automation and Robotics MMAR 2006, 28-31 August 2006, Miedzyzdroje, Poland, 6 pag., ISBN 83-60140-93-6, pp. 651-656
- [5] Korodi A., *Structuri de Reglare Folosite pentru Roboți*, Technical Report, June, 2006, 68 pag.
- [6] Popescu D., Honae D., *An Approach about State - Space Observers Design Using Sensitivities*, Proceedings of the 7th International Conf. on Technical Informatics – CONTI'2006, Vol. 1, Automation and Applied Informatics, , Timisoara, June 2006, ISBN (10) 973 625 320-1, ISBN (13) 978 973 625 320-1, pp.107-110

Research Grants and Contracts:

- [1] CNCSIS Grant, No. 309/33062, Research theme in cooperation with the University of Craiova, The development of automated structures for increase the dependability of the control systems with applications in industrial systems (energetics, chemistry, aviation, robotics), 2004 (continued in 2005 and 2006)
- [2] CNCSIS Grant, Code 205, theme no. 25, contract no. 32940/22.06.2004 (continued in 2005 and 2006), Researches to implement strategies based on fuzzy logic and neural networks for fault detection and diagnosis, with application at the electrical drives, Director: Assoc. prof. dr. eng. Constantin Voloşencu

4.2.A.2 Research Group in Process Control

Director: Lect.Eng. Florin DRĂGAN
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Research Team: T.Assist.Eng. Onuț LUNGU, T.Assist.Eng. Emil VOIȘAN, Eng. Dan ALEXANDRU, T.Assist.Eng. Daniel IERCAN

Research Fields: Chaotic systems; Programmable Logic Controllers; Remote control; Operating Systems; Real-time Programming.

Keywords: Fault detection, identification and diagnosis, modeling, system safety and availability, controller design, process control, interpolating strategies, fuzzy logic, neural networks, control of electrical drives, virtual instruments.

Published Papers:

- [1] Drăgan, F. *Controlling Chaos in DC/DC Converters using Ott-Grebogi-Yorke and Pyragas Methods* WSEAS TRANSACTIONS on CIRCUITS and SYSTEMS Issue 6, Volume 5, June 2006, ISSN 1109-2734, pp. 849-854
- [2] Drăgan, F. *Controlling a chaotic behavior of a Current Mode Controlled Boost Converter Using OGY Method*, 2006 IEEE-TTTC International Conference on Automation, Quality&Testing, Robotics, AQTR 2006, Cluj-Napoca, Romania, ISBN: 1-4244-0361-8, pp. 118-121
- [3] Ghosal, A., Henzinger, T.A., Iercan, D., Kirsch, C., Sangiovanni-Vincentelli, A., *A Hierarchical Coordination Language for Interacting Real-Time Tasks*, 2006, EMSOFT, Seoul, Korea, ISBN: 1-59593-542-8, pp. 132 – 141
- [4] Iercan, D., Ghosal, A., *Timed Input/Output Determinacy for Tasks with Precedence Constraints*, 2006, Proc. Of the 7th International Conference On Technical Informatics - CONTI'06, ISBN: 978-973625-321-8, pp. 149-154
- [5] Voisan, E., Iercan, D., Dragan, F., Lungu O., *Hardware-software Solutions to Surveillance an Objective*, 2006, Proc. Of the 3th Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, ISBN: 963-7154 46-9, pp. 248-255
- [6] Technical Repots: Ghosal, A., Henzinger, T.A., Iercan, D., Kirsch, C., Sangiovanni-Vincentelli, A., *Hierarchical Timing Language*, 2006, Technical Report EECS-2006-79, University of California, Berkeley

4.2.A.3 Research Group in Cryptology and Information Security

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Research Team: Eng. Bogdan GROZA, T.Assist.Eng. Lavinia DRAGOMIR, T.Assist.Eng. Raul ROBU, T.Assist.Eng. Dadiana CĂIMAN

Research Fields: Authentication protocols; Public-key cryptography; Foundations of cryptology; Applied cryptography; Number theory.

Keywords: Authentication protocols, digital signatures, public-key cryptography, entity authentication, message authentication, cryptography, cryptanalysis, one-way functions, trapdoor one-way functions, number theory, complexity theory.

Published Papers:

- [1] Groza, B., *Using one-way chains to provide message authentication without shared secrets*, 2nd International Workshop on Security, Privacy and Trust in Pervasive and Ubiquitous Computing, SecPeru'06, Lyon, France, 2006, IEEE Comp. Soc., ISBN 0-7695-2549-0, pp. 82-87

- [2] Groza, B., *Construction techniques for one-way chains and their use in authentication*, Control Engineering and Applied Informatics Journal, vol. 8, no. 1, 2006, ISSN 1454-8658, pp. 42-51
- [3] Groza, B., *The Delayed Message Authentication Protocol with Chains Constructed On the Discrete Power Function*, 7th International Conference on Technical Informatics, CONTI'06, 2006, ISBN 973-625-319-X, pp. 33-36
- [4] Groza, B., Petrica, D., *On chained cryptographic puzzles*, 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, SACI'06, 2006, ISBN 963-7154-46-9, pp. 182-191
- [5] Silea, I., Petrica D., *Simulink Model for Switched Reluctance Motor Drives*, 7th International Conference on Technical Informatics, CONTI'06, 2006, ISBN 973-625-319-X, pp. 201-208
- [6] Silea, I., Petrica, D., *Aspects of TGS 813 Gas sensor's Use*, 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, SACI'06, 2006, ISBN 963-7154-46-9, pp. 192-203
- [7] Silea, I., Petrica, D., *Distributed Informatic System for the Measurement and Control of Various Dangerous Gases Concentration*, Scientific Bulletin of "Politehnica" University of Timisoara, Transactions on Automatic Control and Computer Science, Vol. 51 (65), No. 1, 2006, ISSN 1224-600X, pp. 65-70

Research Grants and Contracts:

- [1] MEdC-CNCSIS Grant TD-90/2006, Title: Security protocols and cryptographic techniques based on one-way functions for assuring information authenticity, director: Bogdan Groza.
- [2] Cooperation with University of Craiova under MEdC-CNCSIS Grant A-309/2006, Title: The development of automated structures for increase the dependability of the control systems with applications in industrial systems (energetics, chemistry, aviation, robotics).

5 Faculty Events

Organized conferences:

- **CONTI 2006: The 7th International Conference on Technical Informatics, 08-09 June 2006, Timi oara, Romania.** Organizer: "Politehnica" University of Timișoara, Romania, Faculty of Automation and Computers, in cooperation with: *IEEE- Romania section, ASTR - Technical Academy of Science, Romania, SRAIT - Romanian Society of Control Engineering and Technical Informatics, SSICR - Romanian Society of Computer Science and Engineering* Chair: Octavian Proștean ("Politehnica" University of Timișoara, Romania).
- **SACI 2006: 3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence, Timi oara, Romania, May 25-26, 2006.** Organizers: Budapest Polytechnic Hungary and "Politehnica" University of Timișoara, Romania, Faculty of Automation and Computers, in cooperation with: *ASTR - Technical Academy of Science, Romania, SRAIT - Romanian Society of Control Engineering and Technical Informatics, SSICR - Romanian Society of Computer Science and Engineering.* Honorary Chair: László T. Kóczy, General Co-Chairs: Imre J. Rudas (Budapest Polytechnic, Hungary), Nicolae Robu, Vladimir Crețu ("Politehnica" University of Timișoara, Romania).

6 Student League of the Faculty of Automation and Computers

League leader: Simona MICULESCU-DRĂGILĂ
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6.1 Who Are We ?

We are a non-governmental, non-profit and apolitical organization that represents the students of the Faculty of Automation and Computers from "Politehnica" University, Timisoara. Since 1990 we are trying to defend the student's rights and among other thing we are organizing social and cultural events.

6.2 What Have We Done in the Last 16 Years?

International Student Week in Timi oara - ISWinT

ISWinT is an international student festival that gathers for about 200 participants from all over the world each spring since 1994.

The purpose of this festival is to give an opportunity to the students from different countries to communicate freely, to express their opinions. Each edition's theme was selected showing the student's concerns towards the present and the future: "Our Generation, Our Future" (1994), "Communication For A New Europe I" (1995), "Communication For A New Europe II" (1996), "Let's Build Together The Common European House" (1997), "A New Millennium, A New Europe I" (1998), "A New Millennium, A New Europe II" (1999), "Borders vs. Globalization" (2000), "The IIIrd Millennium – Intention Innovation Identity" (2001), "Future Education" (2002), "Attitude! Altitude!" (2003), "Human Rights: Is or Should?" (2004), "Beyond Boundaries >> Fast Forward" (2005).

During that one week the participants have the opportunity to make new friends, to know the Romanian culture to discuss, to express their opinions during the workshops, to attend the conferences. There is a possibility to relax and to have fun each night at the parties and at the sports afternoon. Romania's beautiful landscape is revealed during the one-day trip, when we visit the surroundings.

We could not imagine ISWinT without the "Nations Party". This event is opened to everyone. Each country is presented by the participants (singing, theatre, video-projection), so that we could get familiar with their culture and habits.

Balkans

This ten-day seminar has participants from the Balkan area and held in different locations (Black Sea, Cluj, Brasov). The purpose of this event is to visualize the problems from this area, to discuss about them and to suggest a possible solution. The seminar has four sections – economic, cultural, politic and social – expressed through workshops and conferences. This year we had four trips, so we could observe the multiculturalism of that region. Themes from the last editions:

1998 – "Balkans, towards an open society?"

1999 – "Balkans, evolution or revolution?"

2001 – "Balkans, more than a name"

2003 – "Future for a perfect history"

2004 – "The terror – The new inheritance"

www.OurTimisoara.ro

A web site, created and updated by the students from our organization, with the support of Caatoosee SRL and the "Politehnica" University – since 2001.

Freshmen's Prom

Since 1991, each autumn the freshmen have to face different tests, so they can become "real" students. After the show, the real party begins.

Parties

Christmas Party: the party took place on the 15th December where people met from all generations and we had some special guests too.

Web Design course

This course is addressed especially for the first year students. You can appropriate the basic elements of HTML, PHP, Photoshop.