FACULTY
OF
AUTOMATION AND COMPUTERS
ANNUAL REPORT
2008

Timisoara, 2009
"POLITEHNICA" UNIVERSITY OF TIMISOARA
FACULTY OF AUTOMATION AND COMPUTERS

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                 Prof.Dr.Eng.Gheorghe-Daniel ANDREESCU
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                 Iuliana BOBOIA

Edited: 2009, Timisoara
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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 built 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 of the 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 educational (academic) program of the first section of Computers in Romania begun in 1964 at the Polytechnical Institute of Timisoara (today, the "Politehnica" University of Timisoara). The leader of the section was Prof. Alexandru ROGOJAN. The computer staff was growing which lead 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 the Computers 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 Polytechnical Institute 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 PROŞTEAN (octavian.prostean@ac.upt.ro)  
Vice Deans: Prof. Dr. Eng. Mircea STRATULAT (mircea.stratulat@ac.upt.ro)  
Scientific Secretary: Prof. Dr. Eng. Gh.-Daniel ANDREESCU (daniel.andreescu@ac.upt.ro)
1.2.2 Faculty Council

**Staff Members:**
- Prof. Dr. Eng. Octavian PROŞTEAN
- Prof. Dr. Eng. Daniel-Gh. ANDREESCU
- Prof. Dr. Eng. Horia CIOCĂRLIE
- Prof. Dr. Eng. Ioan FILIP
- Prof. Dr. Eng. Ioan JURCA
- Prof. Dr. Eng. Ioan SILEA
- Prof. Dr. Eng. Ionel JIAN
- Prof. Dr. Eng. Mariu CRISAN
- Prof. Dr. Eng. Mircea VLADUŢIU
- Prof. Dr. Eng. Mircea POPA
- Prof. Dr. Eng. Mircea STRATULAT
- Prof. Dr. Eng. Ionel JIAN
- Prof. Dr. Eng. Mat. Octavian LIPOVAN (invited)
- Prof. Dr. Eng. Mariu CRISAN
- Assoc. Prof. Dr. Eng. Florin DRĂGAN
- Assoc. Prof. Dr. Eng. Marius MARCU
- Assoc. Prof. Dr. Eng. Marius MINEA
- Assoc. Prof. Dr. Mihai MICEA

**Student Members:**
- Cătălin IPA
- Flavius OPRITOIU
- Valentin OROS
- Ildiko PRECUP
- Alexandru TATULEA
- Ioana VEDINAS

1.2.3 Faculty Departments

**Department of Automation and Applied Informatics**
- Head of department: Prof. Dr. Eng. Ioan SILEA
- Address: 2, Vasile Parvan Bv., 300223-Timişoara, 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 CREŢU
- Address: 2, Vasile Parvan Bv., 300223-Timişoara, 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-Timişoara, 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
Head of department: 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. Toma-Leonida DRAGOMIR
- Prof.Dr.Eng. Ioan FILIP
- Prof.Dr.Eng. Radu-Emil PRECUP
- Prof.Dr.Eng. Octavian PROŞTEAN
- Prof.Dr.Eng. Nicolae ROBU
- Prof.Dr.Eng. Ioan SILEA
- Assoc. Prof. Dr. Eng. Florin DRĂGAN
- Lect.Dr.Eng. Dorina PETRICĂ

2.A.3 Academic Staff

Prof.Dr.Eng. Ioan BABUŢIA: Consulting professor
Prof.Dr.Eng. Nicolae BUDIŞAN: PhD. Supervisor, Consulting professor


Prof. Dr. Eng. Ioan FILIP: Database, Internet Applications Programming, Interactive Simulation Tools, CASE Tools, Database Programming Technologies


Prof. Dr. Eng. Stefan PREITL: PhD. Supervisor, Introduction to Automation, Control Structures and Algorithms, Automatic Control Techniques, Modern Control Theory 2

Prof. Dr. Eng. Octavian PROŞTĂNEAN: 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. Ioan SILEA: Computer Networks, Networks with Integrated Services, Wireless networks


Prof. Dr. Eng. Vasile STOICU-TIVADAR: PhD. Supervisor, Object-Oriented Programming, Software Engineering, Management of HealthCare Applications Design, Software Engineering for Medical Informatics, Medical Applications Programming

Prof. Dr. Eng. Constantin VOLOŞENCU: Standardization and Technical Graphics, Sincretic Project 2, Virtual Instrumentation, Norms, Standards and Quality Assurance, Control of Electrical Drives, Virtual Instrumentation in Control, Fault Detection and Diagnosis


Lect. Dr. Eng. Dorina PETRICĂ: Data Structures and Algorithms, Fundamentals of Artificial Intelligence, Expert Systems in Medicine, Syncretic Project 1, Assembly Language

Lect. Dr. Eng. Dorina POPESCU: Languages for Artificial Intelligence, Control Systems Based on Microprocessor Equipments, System Theory, System Science, Fundamentals of Automation, Syncretic Project 2


T.Assist.Dr.Eng. Daniel IERCAN: Programmable Logic Controllers, Data Security Techniques, Syncretic Project 2
T.Assist.Dr. Adrian KORODI: System Theory I, System Theory II, System Theory and Automation, Computer Programming
Dr.Eng. Bogdan GROZA: Artificial Intelligence, Computer System Security, Automotive Data Communication Systems, Syncretic Project 2
T.Assist.Eng. Lucian Ovidiu FEDOROVICI: Operating Systems, Programmable Logic Controllers, Syncretic Project 1, Syncretic Project 2
PhD.Stud.Eng. Ion-Bogdan URSACHE: Control Structures and Algorithms
Eng. Adrian POPA: Specific Digital Circuit Design
Eng. Florin OCOLIȘAN: Introduction to Robot Control
2.A.4 Administrative and Technical Staff

1. Lucica ANTON  
   Secretary
2. Monika-Agnetă ELEKEȘ  
   Technician
3. Iuliana-Margareta CIOBANU  
   Technician
4. Eng. Gabriel VLASIU  
   Network engineer
5. Mărioara 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. 62, and Autonomous Research Groups, pp. 88)
- Renewable energy, System Identification and Adaptive Systems (see Research Division in Automation and Industrial Informatics, pp. 625)
- Medical Informatics (see Research Division in Automation and Industrial Informatics, pp. 627)
- Real-Time Control Systems (see Research Division in Automation and Industrial Informatics, pp. 70)
- Applied Systems Theory (see Autonomous Research Groups, pp. 88)
- Cryptology and Information Security (see Autonomous Research Groups, pp. 889)

2.A.7 PhD Activity

PhD Advisors:

<table>
<thead>
<tr>
<th>PhD Advisor</th>
<th>Number of Phd Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof.Dr.Eng. Gheorghe-Daniel ANDREESCU</td>
<td>3</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Nicolae BUDIŞAN</td>
<td>6</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Daniel-Ioan CURIAC</td>
<td>3</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Toma-Leonida DRAGOMIR</td>
<td>13</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Radu-Emil PRECUP</td>
<td>9</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Ştefan PREITL</td>
<td>4</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>9</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Nicolae ROBU</td>
<td>6</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Lăcârmioara STOICU-TIVADAR</td>
<td>2</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Vasile STOICU-TIVADAR</td>
<td>2</td>
</tr>
</tbody>
</table>
### PhD programs:

<table>
<thead>
<tr>
<th>Nr.</th>
<th>PhD Student</th>
<th>PhD Theme / Domain</th>
<th>PhD Advisor</th>
<th>Enrollment Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tiberiu IONICĂ</td>
<td>Automation domain</td>
<td>Prof. Dr. Eng. Gheorghe-Daniel ANDREESCU</td>
<td>Oct. 2006</td>
</tr>
<tr>
<td>2</td>
<td>Cristian SCHLEZINGER</td>
<td>Systems engineering domain</td>
<td>Prof. Dr. Eng. Gheorghe-Daniel ANDREESCU</td>
<td>Oct. 2007</td>
</tr>
<tr>
<td>4</td>
<td>Adriana PRATA</td>
<td>Contributions to Internet commercial Operation automation</td>
<td>Prof. Dr. Eng. Nicolae BUDIȘAN</td>
<td>Nov. 2001</td>
</tr>
<tr>
<td>5</td>
<td>Adela BERDIE</td>
<td>Principles, methods and technologies for object-oriented soft systems standardization</td>
<td>Prof. Dr. Eng. Nicolae BUDIȘAN</td>
<td>Nov. 2003</td>
</tr>
<tr>
<td>6</td>
<td>Ovidiu FALCAN</td>
<td>Study and integration of some electronic devices into unconventional generator sets control systems</td>
<td>Prof. Dr. Eng. Nicolae BUDIȘAN</td>
<td>Oct. 2004</td>
</tr>
<tr>
<td>7</td>
<td>Bogdan MUSCA</td>
<td>Contributions to energy supply systems automation for remote sites exploitation, based on alternative energy sources</td>
<td>Prof. Dr. Eng. Nicolae BUDIȘAN</td>
<td>Oct. 2004</td>
</tr>
<tr>
<td>8</td>
<td>Valentin NEDELEA</td>
<td>Contributions to microhydro groups optimal control</td>
<td>Prof. Dr. Eng. Nicolae BUDIȘAN</td>
<td>Oct. 2004</td>
</tr>
<tr>
<td>9</td>
<td>Daniel TOADER</td>
<td>Contributions to energy supply systems for some agricultural exploitation</td>
<td>Prof. Dr. Eng. Nicolae BUDIȘAN</td>
<td>Oct. 2004</td>
</tr>
<tr>
<td>10</td>
<td>Iosif GUT</td>
<td>Computer science domain</td>
<td>Prof. Dr. Eng. Daniel-Ioan CURIAC</td>
<td>Oct. 2008</td>
</tr>
<tr>
<td>11</td>
<td>Madalin PLASTOI</td>
<td>Computer science domain</td>
<td>Prof. Dr. Eng. Daniel-Ioan CURIAC</td>
<td>Oct. 2008</td>
</tr>
<tr>
<td>12</td>
<td>Giorgia DICU</td>
<td>Computer science domain</td>
<td>Prof. Dr. Eng. Daniel-Ioan CURIAC</td>
<td>Oct. 2008</td>
</tr>
<tr>
<td>13</td>
<td>Constantin Dorin BICHIS</td>
<td>Adaptive control in methan gas distribution</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Dec. 1999</td>
</tr>
<tr>
<td>14</td>
<td>Ovidiu Lucian MOLDOVAN</td>
<td>Control problems associated to hydroelectrical plant considering uncertainties</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Nov. 2001</td>
</tr>
<tr>
<td>15</td>
<td>Emil-Ioan VOIȘAN</td>
<td>Control problems for distributed systems applied in telematic</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Nov. 2002</td>
</tr>
<tr>
<td>16</td>
<td>Ana-Maria DAN</td>
<td>Applications of system theory in non industrial fields</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Nov. 2003</td>
</tr>
<tr>
<td>17</td>
<td>Sanda Valentina BĂLAȘ</td>
<td>Applications of intelligent systems in non industrial fields</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Oct. 2004</td>
</tr>
<tr>
<td>18</td>
<td>Bogdan Ioan GROZA</td>
<td>Integrated safety cryptographic solutions in control systems</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Oct. 2004</td>
</tr>
<tr>
<td>19</td>
<td>AurelianDorel IGNAT</td>
<td>Supervized control of complex systems</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Oct. 2004</td>
</tr>
<tr>
<td>20</td>
<td>Cezar POPESCU</td>
<td>Automation domain</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Oct. 2006</td>
</tr>
<tr>
<td>21</td>
<td>Ștefan OCTAVIAN</td>
<td>Automation domain</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Oct. 2006</td>
</tr>
<tr>
<td>22</td>
<td>Alina Mariana ILIN</td>
<td>System’s approach in quality management</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>Oct. 2007</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Contributions</td>
<td>Adviser</td>
<td>Date</td>
</tr>
<tr>
<td>-----</td>
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<td>---------------------------------------------------------------------------------------------------</td>
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<td>------------</td>
</tr>
<tr>
<td>25</td>
<td>Radu BORACI</td>
<td>Contributions to digital control structures synthesis of electric drive systems and of electrogen systems</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Dec.1999</td>
</tr>
<tr>
<td>26</td>
<td>Calin CIRSTEA</td>
<td>Contributions to the development of distributed fault redundant systems</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Nov.2003</td>
</tr>
<tr>
<td>27</td>
<td>Andrei GUDIU</td>
<td>Contributions regarding the distributed system’s remote control</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Oct.2004</td>
</tr>
<tr>
<td>28</td>
<td>Dan Lucian MIHAILESCU</td>
<td>Contributions regarding the analysis, modeling and control of distributed systems</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Oct.2004</td>
</tr>
<tr>
<td>29</td>
<td>Iosif SZEIDERT</td>
<td>Control systems used in unconventional energetics</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Dec.1999</td>
</tr>
<tr>
<td>30</td>
<td>Cristian VASAR</td>
<td>Contributions regarding the neuro-fuzzy structures usage in system identification</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Dec.1999</td>
</tr>
<tr>
<td>31</td>
<td>Emanuel Ciprian SASU</td>
<td>Systems engineering domain</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Oct.2008</td>
</tr>
<tr>
<td>32</td>
<td>Anca-Ramona BORACI</td>
<td>Systems engineering domain</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Oct.2008</td>
</tr>
<tr>
<td>33</td>
<td>Ana Daniela CRISTEA</td>
<td>Automation domain</td>
<td>Prof.Dr.Eng. Octavian PROŞTEAN</td>
<td>Oct.2006</td>
</tr>
<tr>
<td>34</td>
<td>Zsuzsa PREITL</td>
<td>Contributions to the development of model-based control structures</td>
<td>Prof.Dr.Eng. Radu-Emil PRECUP</td>
<td>Oct.2004</td>
</tr>
<tr>
<td>35</td>
<td>Marian STAN</td>
<td>Contributions to the development of control structures dedicated to vehicle braking systems</td>
<td>Prof.Dr.Eng. Radu-Emil PRECUP</td>
<td>Oct.2004</td>
</tr>
<tr>
<td>36</td>
<td>Ovidiu BANIAŞ</td>
<td>Contributions to urban road traffic control using a wireless sensor network as traffic detector</td>
<td>Prof.Dr.Eng. Radu-Emil PRECUP</td>
<td>Oct.2005</td>
</tr>
<tr>
<td>37</td>
<td>Adrian Sebastian PAUL</td>
<td>Contributions to automatic control problems in digital audio signal processing</td>
<td>Prof.Dr.Eng. Radu-Emil PRECUP</td>
<td>Oct.2006</td>
</tr>
<tr>
<td>43</td>
<td>Corina LAMOS</td>
<td>Contributions on development of fuzzy control structures</td>
<td>Prof.Dr.Eng. Ştefan PREITL</td>
<td>Nov.2002</td>
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<tr>
<td>44</td>
<td>Csongor SZABO</td>
<td>Contributions on development of control structures for mobile robots</td>
<td>Prof.Dr.Eng. Ştefan PREITL</td>
<td>Oct.2004</td>
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<tr>
<td>45</td>
<td>Marius TOMESCU</td>
<td>Contributions on development of fuzzy control structures</td>
<td>Prof.Dr.Eng. Ştefan PREITL</td>
<td>Nov.2003</td>
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<tr>
<td>46</td>
<td>Peter BALAZS</td>
<td>Contributions to the development of traffic control systems</td>
<td>Prof.Dr.Eng. Ştefan PREITL</td>
<td>Oct.2006</td>
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<td>47</td>
<td>Dan-Teodor ALEXANDRU</td>
<td>Computer science domain</td>
<td>Prof.Dr.Eng. Nicolae ROBU</td>
<td>Oct.2005</td>
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<td>48</td>
<td>Iercan DANIEL</td>
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<td>Prof.Dr.Eng. Nicolae ROBU</td>
<td>Oct.2005</td>
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<td>49</td>
<td>Alexander SCHEID     (from Germany)</td>
<td>Contributions to the development of fuzzy control structures</td>
<td>Prof.Dr.Eng. Nicolae ROBU</td>
<td>Oct.2005</td>
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<td>50</td>
<td>Roman MAGDA</td>
<td>Computer science domain</td>
<td>Prof.Dr.Eng. Nicolae ROBU</td>
<td>Oct.2005</td>
</tr>
<tr>
<td>Nr.</td>
<td>Author</td>
<td>Title</td>
<td>Scientific Supervisor</td>
<td>Publication Date</td>
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<tr>
<td>1</td>
<td>Mariana MOGA</td>
<td>Contribuții la abordarea sistemică a semnalului ECG</td>
<td>Prof. Dr. Eng. Gheorghe. I. MIHALAȘ (UMFVB) Prof. Dr. Eng. Toma-Leonida DRAGOMIR (UPT)</td>
<td>18.01.2008</td>
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<tr>
<td>2</td>
<td>Zsuzsa PREITL</td>
<td>Model based design Methods for Speed Control Applications</td>
<td>Prof. Dr. Eng. Radu-Emil PRECUP</td>
<td>05.04.2008</td>
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<tr>
<td>3</td>
<td>Marius-Lucian TOMESCU</td>
<td>Contributions on analysis and development fuzzy controllers for nonlinear plants</td>
<td>Prof. Dr. Eng. Ștefan PREITL</td>
<td>18.07.2008</td>
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<tr>
<td>4</td>
<td>Bogdan Ioan GROZA</td>
<td>Hybrid cryptographic solutions based on symmetrical and asymmetrical techniques – applications in control systems</td>
<td>Prof. Dr. Eng. Toma-Leonida DRAGOMIR</td>
<td>19.07.2008</td>
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<td>5</td>
<td>Dan Ioan STOIA</td>
<td>Modelarea, dezvoltarea și testarea implanturilor pentru coloana vertebrală</td>
<td>Prof. Dr. Eng. Nicolae ROBU Prof. Dr. Eng. Nicolae FAUR</td>
<td>12.09.2008</td>
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<tr>
<td>6</td>
<td>Daniel IERCAN</td>
<td>Contributions to the development of real-time programming techniques and technologies</td>
<td>Prof. Dr. Eng. Nicolae ROBU</td>
<td>27.09.2008</td>
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PhD Reports published in 2008:

<table>
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<tr>
<th>Nr.</th>
<th>Author</th>
<th>Title</th>
<th>Scientific Supervisor</th>
<th>Publication Date</th>
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<tr>
<td>1</td>
<td>Ovidiu FALCAN</td>
<td>Bibliography study on electronic subsystems of unconventional generator sets</td>
<td>Prof. Dr. Ing. Nicolae Budisan</td>
<td>21.08.2008</td>
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<td>2</td>
<td>Daniel TOADER</td>
<td>Studies and solutions proposals automation of some supply systems of agricultural farms</td>
<td>Prof. Dr. Ing. Nicolae Budisan</td>
<td>5.09.2008</td>
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<td>3</td>
<td>Valentin NEDELEA</td>
<td>Study of present state of electrical and control equipments of conversion line of microhydro groups</td>
<td>Prof. Dr. Ing. Nicolae Budisan</td>
<td>16.07.2008</td>
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<td>4</td>
<td>Bogdan MUSCA</td>
<td>Study of present state of electrical and control equipments of energy conventional supply systems</td>
<td>Prof. Dr. Ing. Nicolae Budisan</td>
<td>22.08.2008</td>
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<tr>
<td>5</td>
<td>Zsuzsa PREITL</td>
<td>Case Studies on Model Based Control Solutions</td>
<td>Prof. Dr. Eng. Radu-Emil PRECUP</td>
<td>12.03.07</td>
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<tr>
<td>6</td>
<td>Ovidiu BANIAȘ</td>
<td>First research report in the doctoral research program</td>
<td>Prof. Dr. Eng. Radu-Emil PRECUP</td>
<td>26.09.07</td>
</tr>
</tbody>
</table>
2.C Department of Computer and Software Engineering

Correspondence address: 2, Vasile Parvan Bv., 300223-Timisoara, 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 CREŢU
Secretary: Maria DUMITROV, Eng. Alexandru PETŐFI

2.C.1 Brief History

1960 In the Polytechnical Institute of Timisoara, the MECIPT Research Center ("Electronic Computing Machine of the Polytechnical 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 Polytechnical 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 Soceneanu).
1984 First Pascal Compiler for the Romanian FELIX computers is developed.
1990 The Faculty of Automation and Computers is set up at the Politehnical Institute of Timisoara.
1996 The Computer Science Department becomes "Computer and Software Engineering Department".
2.C.2 Department Board

Prof.Dr.Eng. Vladimir CREŢU
Prof.Dr.Eng. Mircea STRATULAT
Prof.Dr.Eng. Mircea POPA
Prof.Dr.Eng. Ioan JURCA
Prof.Dr.Eng. Ştefan HOLBAN
Prof.Dr.Eng. Marius CRIŞAN

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

2.C.3 Academic Staff


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

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

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


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. Crişan STRUGARU Input-Output Systems, Local Area Computer Networks, Peripheral Equipments, Computer Network Design


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

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


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

Assoc.Prof.Dr.Eng. Horaţiu MOLDOVAN Image Processing and Recognition

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

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

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


Lect.Dr.Eng. Constantin COSOVAN Quality in Information Technology, Computer Aided Integrated Production Systems

Lect.Dr.Eng. Lucian PRODAN Fault Tolerant Systems

Lect.Dr.Eng. Mihai UDRESCU-MILOSAV Computing Systems Reliability

T.Assist. Dr.Eng. Alexandru AMĂRICĂI Computer Engineering 2 (L)
T.Assist.Dr.Eng. Oana AMĂRICĂI Computer Fundamentals (L), Computer Engineering 2 (L)
T.Assist.Eng. Versavia ANCUSĂ Computer Engineering 1 and 2
T.Assist.Eng. Gabriela BOBU Computer Programming 1 and 2
T.Assist.Dr.Eng. Oana Maria CĂUŞ Programming Techniques (C, L), Computer Programming (L), Fundamentals of Programming Languages (L), Programming Languages (L)
T.Assist.Eng. Cosmin CERNĂZANU-GLĂVAN Basic Concepts of Artificial Intelligence (L), Artificial Intelligence (L)
T.Assist.Eng. Ciprian CHIRILĂ Data Structures and Algorithm Analysis, Compiling Techniques
T.Assist.Eng. Răzvan CIOARGĂ Peripheral Equipments
T.Assist.Eng. Bogdan CIUBOTARU Integrated Circuits 1
T.Assist.Eng. Sebastian FUICU Local Area Networks, Input/Output Systems
T.Assist.Eng. Carmen HOLOTESCU Internet technologies
T.Assist.Eng. Călin JEBELEAN Data Structures and Algorithm Analysis, Compiling Techniques, Basics of Artificial Intelligence
T.Assist.Eng. Adrian MIHĂILESCU Analysis and Synthesis of Numerical Devices 1 and 2
T.Assist.Eng. Daniela STĂNESCU Integrated Circuits 1 and 2
T.Assist.Eng. Adrian TRIFU Software Engineering 2(L)
PhD.Stud.Eng Dan CIREŞAN Basic Concepts of Artificial Intelligence(L)
PhD.Stud.Eng Codruta ISTIN Database Systems(L)
PhD.Stud.Eng Georgiana MACARIU Parallel Computing Algorithms (L)
PhD.Stud.Eng Vlad MOLNAR Modeling and Simulation (L)
PhD.Stud.Eng Flavius OPRITOIU Computer Architecture (L)
PhD.Stud.Eng. Roxana TEOODORESCU Data Structures and Algorithms (L), Data Structures and Algorithm Analysis (L)
PhD.Stud.Eng Roxana TUDOROIU Computer Programming (L)
PhD.Stud.Eng Valentin URITESTI Operating Systems(L), Computer Programming (L)

2.C.4 Administrative and Technical Staff

1 Maria DUMITROV Secretary
2 Alexandru PETŐFI Secretary
3 Rodica CIOCARLEI Engineer
4 Ambroziu BĂLAN Technician
5 Maria STOLOJESCU Technician
6 Pavel GARTNER Technician
7 Maria CURESCU Janitor
8 Floare GOLBAN Janitor
9 Herta OPRIŞAN Janitor
2.C.5 Main Laboratories

- A305 Laboratory Data Structures and Algorithms; Real-Time Programming
- B413 Laboratory Microsystems and Embedded Systems
- B414 Laboratory Local Area Networks; Peripheral and I/O Equipments
- B418-a Laboratory Computer Use and Programming
- B418-b Laboratory Compiling Techniques; Database Systems
- B419 Laboratory Basic Concepts of 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
- B514 Laboratory Object-Oriented Programming; Software Engineering
- B515 Laboratory Analysis and Syntthesis 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 Database Design, Advanced in Databases; Expert sistems
- B523 Laboratory Database; 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. 744)
- Data Bases and Artificial Intelligence (see *CC-SICTI-UPT Research Center*, pp. 747)
- Software Engineering (see *CC-SICTI-UPT Research Center*, pp. 749)
- Real-Time and Embedded Systems and Digital Signal Processing (see *CC-SICTI-UPT Research Center*, pp.81)
- Electrical Machine and Equipment Testing Using Digital Signal Acquisition and Processing Systems (see *CC-SICTI-UPT Research Center*, pp.86)

2.C.7 PhD Activity

PhD Advisors:

<table>
<thead>
<tr>
<th>PhD Advisor</th>
<th>Number of Phd Students</th>
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<tbody>
<tr>
<td>Prof.Dr.Eng. Horia CIOCARLIE</td>
<td>3</td>
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<tr>
<td>Prof.Dr.Eng. Vladimir CREŢU</td>
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<tr>
<td>Prof.Dr.Eng. Stefan HOLBAN</td>
<td>16</td>
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<tr>
<td>Prof.Dr.Eng. Ionel JIAN</td>
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<td>Prof.Dr.Eng. Ioan JURCA</td>
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<td>Prof.Dr.Eng. Mirea POPA</td>
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<td>Prof.Dr.Eng. Mirea STRATULAT</td>
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<td>Prof.Dr.Eng. Mirea VLADUTIU</td>
<td>15</td>
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<td>Prof.Dr.Eng. Crişan STRUGARU</td>
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PhD programs:

<table>
<thead>
<tr>
<th>Nr.</th>
<th>PhD Student</th>
<th>PhD Theme / Domain</th>
<th>PhD Advisor</th>
<th>Enrollment Date</th>
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<tbody>
<tr>
<td>5</td>
<td>Bocan Valer</td>
<td>Computer Science/ waiting for Thesis Proposal (end of 1st year)</td>
<td>Prof.Dr.Eng. Creţu Vladimir</td>
<td>Nov. 2000</td>
</tr>
<tr>
<td>7</td>
<td>Cioargă Răzvan Dorei</td>
<td>Emergent Behavior in a Robotic Collaborative Environment</td>
<td>Prof.Dr.Eng. Creţu Vladimir</td>
<td>Oct. 2005</td>
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<tr>
<td>10</td>
<td>Holotescu Mariana Carmen</td>
<td>E-Learning. Formalization and syndications of learning scenarios</td>
<td>Prof.Dr.Eng. Creţu Vladimir</td>
<td>Oct. 2005</td>
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<tr>
<td>15</td>
<td>Teodorescu Roxana Oana</td>
<td>Advanced Image Processing</td>
<td>Prof.Dr.Eng. Creţu Vladimir</td>
<td>Oct. 2006</td>
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<td>17</td>
<td>Tudor Dacian Florin</td>
<td>Auto-Configurable Software Management for GRID-Type Architectures</td>
<td>Prof.Dr.Eng. Creţu Vladimir</td>
<td>Oct. 2004</td>
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<td>18</td>
<td>Tuţac Adina Eunice</td>
<td>Advanced Image Processing</td>
<td>Prof.Dr.Eng. Creţu Vladimir</td>
<td>Oct. 2006</td>
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<tr>
<td>19</td>
<td>Andone Diana Maria</td>
<td>Contributions to Development of E-Learning Informationsal Informational Technologies</td>
<td>Prof.Dr.Eng. Holban Ştefan</td>
<td>Nov. 2003</td>
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<tr>
<td>21</td>
<td>Cheveresan Razvan Traian</td>
<td>Methods for Improving the Execution Speed of Uniprocessor Systems</td>
<td>Prof.Dr.Eng. Holban Ştefan</td>
<td>Oct. 2004</td>
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<td>22</td>
<td>Ciubotaru Ciupian</td>
<td>Handwritten Numerical String Recognition</td>
<td>Prof.Dr.Eng. Holban Ştefan</td>
<td>Nov. 2002</td>
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<td>23</td>
<td>Delamarion Adrian</td>
<td>Analysis of Programs Written in Pointer-Based Languages</td>
<td>Prof.Dr.Eng. Holban Ştefan</td>
<td>Oct. 2004</td>
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<td>25</td>
<td>Melencu Helios</td>
<td>Contributions to Developing Architectures for Distributed Databases of Large Dimensions</td>
<td>Prof.Dr.Eng. Holban Ştefan</td>
<td>Oct. 2004</td>
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<td>26</td>
<td>Mihăilescu Adrian</td>
<td>Contributions to Data Analysis and Processing in Genetic Analysis</td>
<td>Prof.Dr.Eng. Holban Ştefan</td>
<td>Oct. 2007</td>
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<td>Proposal (end of 1st year)</td>
<td>Holban Ştefan</td>
<td>Prof.Dr.Eng.</td>
<td>Oct 2008</td>
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<td>Contributions to Recognition of GIS Database Objects Using Data Mining</td>
<td></td>
<td>Oct. 2006</td>
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<td>Contributions to Formal Analysis of Software Applications</td>
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<td>Research on Using Graphic Accelerators in the Field of Databases</td>
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<td>Reverse Engineering Object-Oriented Distributed Systems</td>
<td></td>
<td>Nov. 2002</td>
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<td>Partial synchronous distributed algorithms analysis</td>
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<td>Database optimization</td>
<td></td>
<td>Oct. 2005</td>
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<td>Towards Understanding and Quality Assessment of Enterprise Software Systems</td>
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<td>Operating systems for computer networks</td>
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<td>Anthologies Design for Semantic Web</td>
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<td>Principles for data mapping in distributed systems</td>
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<td>Component-based programming systems interoperability</td>
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<td>Contributions to the Modelling and Use of Software Product Lines</td>
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<td>Computer Networks Performance Improvement Based on Traffic Analysis</td>
<td></td>
<td>Nov. 2003</td>
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<td>Contributions to the Field of Heterogenous Robotic Systems With Autonomous Navigation</td>
<td></td>
<td>Oct. 2005</td>
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<td>Contributions to Modern Multimedia Technologies Utilization</td>
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<td>Reactive Sciences Controlled Through Behaviors</td>
<td></td>
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<td>Computer Science/ waiting for Thesis Proposal (end of 1st year)</td>
<td></td>
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<td></td>
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<tr>
<td>Nr.</td>
<td>Author</td>
<td>Title</td>
<td>Scientific Supervisor</td>
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<tr>
<td>1</td>
<td>Ionel MUSCALAGIU</td>
<td>Contribuții la implementarea, evaluarea și îmbunătățirea performanțelor tehnicilor de căutare asincrone în cadrul programării pe constrângeri distribuite</td>
<td>Prof.Dr.Eng.Vladimir CREȚU</td>
<td>01.02.2008</td>
</tr>
<tr>
<td>2</td>
<td>Ovidiu Constantin NOVAC</td>
<td>Cercetări ale eficienței metodelor de creștere a dependabilității la treapta cache a unei ȘVESTIIE de memorii</td>
<td>Prof.Dr.Eng.Mircea VLĂDUȚIU</td>
<td>01.02.2008</td>
</tr>
<tr>
<td>3</td>
<td>Adrian ZAFIU</td>
<td>Minimizarea sistemelor decizionale multivalente deterministe și nedeterministe</td>
<td>Prof.Dr.Eng.ȘTEFAN HOLBAN</td>
<td>05.07.2008</td>
</tr>
<tr>
<td>4</td>
<td>Dan CIREȘAN</td>
<td>Recunoașterea șirurilor numerice scrise de mână</td>
<td>Prof.Dr.Eng.ȘTEFAN HOLBAN</td>
<td>17.10.2008</td>
</tr>
<tr>
<td>5</td>
<td>Alexandru AMĂRICĂI</td>
<td>Proiectarea unităților de virgulă flotantă pentru aritmetica intervalelor</td>
<td>Prof.Dr.Eng.Mircea VLĂDUȚIU</td>
<td>19.12.2008</td>
</tr>
<tr>
<td>6</td>
<td>Oana BONCALO</td>
<td>Analiza bazată pe stimulare a fiabilității circuitelor cuantice</td>
<td>Prof.Dr.Eng.Mircea VLĂDUȚIU</td>
<td>19.12.2008</td>
</tr>
</tbody>
</table>
3 Educational Activity

3.1 Educational Programs

Education is organized according to the European Credit Transfer 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 three-level 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 conducted by the 12 doctoral supervisors from our faculty.

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

Enrollment 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:**

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**Number of graduates in 2008:**

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### 3.2 Curricula and Syllabus

#### 3.2.A Automation and Applied Informatics Section

##### 3.2.A.1 Curricula

**Systems Engineering Specialization (SE, 4 years)**

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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. Lăcrămioara 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-1-12: Standards and Technical Graphics (Prof.Dr.Eng. Constantin VOLOȘENCU)
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.

Second Year of Study

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-1-06: Standards and Technical Graphics (Lect.Dr.Eng. Dorina PETRICĂ)
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); Thistors; Triacs; Operational integrated amplifiers (types, main applications in automatics); Voltage sources; Electronic circuits (operation analysis, synthesis); Application of electronic devices in automatics.

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.

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)

SE-2-05: Specific 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, logic sequencers; 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 (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 PROSTEAN)**
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 PROSTEAN)**
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 conceptions 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 (SE)**

**SE-3-02: Control Structures and Algorithms (Prof.Dr.Eng. Stefan PREITL)**

**SE-3-03: Programming Environments and Technologies (Lect.Dr.Eng. Dorin BERIAN)**
Objective: to provide knowledge and practical skills about development of medium and high complexity applications in Visual Basic .NET environment.
The course covers the following issues: Visual Studio .NET environment presentation, Visual Basic language aspects presentation, user interface design, usual and special controls, MDI, SDI and dialog forms, graphics and databases in Visual Basic .NET, special topics (client server applications using sockets).

**SE-3-04: Internet Applications Programming (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.

**SE-3-05: 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.
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.

**SE-3-06: Programmable Logic Controllers**
(T.Assist.Eng. Onut 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.

**SE-3-07: Data Communication**
(T.Assist.Eng. Cezar POPESCU)


**SE-3-08: Embedded Systems**
(Lect.Dr.Eng. Dan Ungureanu)

Objective: to provide knowledge and practical skills about embedded systems. The basic concept of embedded systems based on different type of microcontrollers: INTEL 8051, MOTOROLA 68HC11. The peripheral circuits: i8255, i8259A. Microcontrollers assembly languages. Process interfaces: digital input/output modules and analog input/output modules. Embedded computers: PC/104 standard. Applications: design of embedded systems based on 8051 microcontroller.

**SE-3-09: Syncretic Project 1-1 “Microcontroller used in electric micro motor control“**
(Lect. Dr. Eng. Sorin NANU)

The task is to design and built a data acquisition system with a microcontroller connected to a PC. The information is displayed on PC screen, a LED is lightning if a reference temperature is reached. Additionally, a servomotor will indicate the temperature with a needle, and another LED will be turned off and on from two buttons from PC console. Students are receiving the components, they will have to build the device and write the software.

**SE-3-09: Syncretic Project 1-2 “Applications using microcontrollers and DSP for the command, control and protection of power electronic equipment.“**
(T.Assist.Eng. Radu BORACI)

The main objective of the project is to provide students know-how about design and built command, supervision and protection systems based on microcontrollers and digital signal processors (DSP) for equipment with power electronic circuits with IGBT used in automated control systems: rectifiers, inverters, frequency converters (single / polyphase), switching sources, commutation sources, etc.

**SE-3-09: Syncretic Project 1- 3 “Monitoring system for electric power consumption in the industrial environment“**
(Lect. Dr. Eng. Dorina PETRICĂ)

The project requests to the student to process 14 types of measurements (powers, current on phases, energy quantities, voltage on phases ) that are collected from electric meters and stored them in a database used to generate different types of reports. The students must solve the problem by creating an application based on the C# programming language, improving in this way the students knowledge on computer peripherals and database management.

**SE-3-09: Syncretic Project 1 - 4 ”Process Remote Control“**
(Lect. Dr. Eng. Florin DRĂGÂN)

The main objective of the project is students preparation for development of process remote control application, using different languages, technologies and programming platforms, team working and communication. Knowledge categories: software development project. Competencies percentage: “Design, implementation, testing, evaluation, administration and maintain applications using different languages, technologies, platforms and programming”- 40%.

**SE-3-12: Operating Systems**
(Lect.Dr.Eng. Florin DRĂGÂN)

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.

**SE-3-13: Information Security**
(Prof.Dr.Eng. Daniel-Ioan CURIAC)

The main focus of the course will be 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.

**SE-3-14: Database Programming Technologies** *(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.

**SE-3-15: Software modelling. UML. XML** *(Lect. Dr. Eng. Florin DRAGAN)*

The course put the foundations in preparing students for a systematic approach to the development of a software project, in one learning system (UML) allowing the realization of a concept plan for the project and presenting viable solutions to solve some key issues that may arise during the development and integration concepts in XML projects. Knowledge categories: software development project. Competencies percentage: “Understanding and using basic concepts of computer science and computer”-40%, “Design, implementation, testing, evaluation, administration and maintain applications using different languages, technologies platforms and programming”-20%.

**SE-3-16: Complex Automation** *(Prof.Dr.Eng. Octavian PROSTEAN)*

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.

**SE-3-17: Control Engineering** *(Prof.Dr.Eng. Radu-Emil PRECUP)*


**SE-3-18: 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.

**SE-3-19: Measurement and Interfacing Structures for Control Systems** *(Lect.Dr.Eng. Sorin NANU)*

The course is presenting principles of measurement, signal, flow of information in a control system, structures of data acquisition system, connectivity and busses. The computer hardware, passive and active components are presented in typical examples of interfacing with processes. In course are included filters, basic of signal processing (Fourier, convolution).

**SE-3-20: Syncretic Project 2-1 “Temperature control system”** *(Lect.Dr.Eng. Dorina POPESCU)*

The task is to design and built an image acquisition system from a web cam, 2D oriented by two servomotors. Information is encripted and sent to a PC and further on intrenet. The system can be oriented manually or by sensing a person in a certain area with two PIR sensors.

**SE-3-20: Syncretic Project 2-2 “Positioning and control system using a microcontroller”** *(Lect.Dr.Eng. Sorin NANU)*

The goal is to design and implement a complex application of contro sytem. Project management, team working and communication skills are developed.

**SE-3-20: Syncretic Project 2-3 “Process Control and Monitoring”** *(Lect.Dr.Eng. Florin DRĂGAN)*

The main objective of the project is students preparation for development of a process control and monitoring application, using different languages, technologies and programming platforms, team working and communication. Knowledge categories: software development project. Competencies percentage: “Design, implementation, testing, evaluation, administration and maintain applications using different languages, technologies, platforms and programming”- 40%.

**SE-3-20: Syncretic Project 2-4 “Design of a control system for an electric drive”** *(Prof. Dr. Eng. Constantin VOLOȘENCU)*


**Fourth Year of Study (SE)**

**SE-4-02: Process Automation in Flexible Manufacturing Structures** *(T.Assist.Eng. Onuț LUNGU)*

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

**SE-4-03: 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.

**SE-4-04: Virtual Instrumentation (Prof.Dr.Eng. Constantin VOLOŞENCU)**


**SE-4-05: 3D Graphics (Prof. Dr.Eng. Daniel-Ioan CURIAC)**

This course has as main objective to offer required knowledge and skills for computer graphics: algorithms, colour representation, visualization and animation. The software technology used to develop the projects is OpenGL.

**SE-4-06: Assembly Language (Lect.Dr.Eng. Dorina PETRICĂ)**

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.

**SE-4-07: Windows Programming (Lect.Dr.Eng. Dorin BERIAN)**

Objective: to provide knowledge and practical skills about development of medium complexity applications in Visual C++ environment. The course covers the following issues: Windows mechanisms, the Visual C++ environment, user interface design, usual classes in Microsoft Foundation Classes, templates, Document-View architecture, graphics and databases, in Visual C++, mobile applications on PocketPC developed with Embedded Visual C++, improvements in Visual C++ .NET.

**SE-4-08: Intranet Networks (Lect.Dr.Eng. Florin DRĂGAN)**

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.

**SE-4-09: Programmable Logic Controllers (T.Assist.Eng. Onuţ 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.

**SE-4-10: System Identification (Prof.Dr.Eng. Octavian PROŞTEAN)**

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.

**SE-4-11: Supervisory Control and Data Acquisition (SCADA) (Prof.Dr.Eng Gheorghe-Daniel ANDREESCU)**

Objectives: to provide knowledge and practical skills in SCADA distributed systems: hardware, software, communications, industrial SCADA platform. Course contents: SCADA definitions and applications; Specific communications, serial busses, wireless; Distributed field components: sensors, analogic and digital interfaces, signal conditionings; industrial PLC; Electromagnetically compatibility, land lines; SCADA platform: specifications, components, objects; Remote terminal unit; Master terminal unit; Graphical user interface; Troubleshooting; Study cases: Applications
of distributed monitoring and control systems (SCADA) for electrical energy, water, gas, heating.

SE-4-12: Digital Equipment Used in Medicine (Lect. Dr. Eng. Antonius STANCIU)
The modern medicine cannot be any longer imagined without a serious technological support. Most of this technological support is based on automated digital equipment. There are presented imagistic investigation devices (Radiology, X-ray Computed Tomography, MRI — Magnetic Resonance Imaging, PET — Positron Emission Tomography, Echography, Microscopy), analytic investigation devices, monitoring devices (for use in Intensive Care Units), surgical devices (optomechanical, electrical, lasers), corrective devices (prostheses and orthese, bionics), physical therapy (based on thermal and electrical factors). After passing the lecture, the students will benefit from an overview about medical technology, being able to understand relevant parameters for choosing the right device for a specific purpose. They can act as technical support staff in major hospitals and clinics, a category almost nonexistent in Romania.

SE-4-13: Internet Applications Programming (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.

SE-4-14: Networks with Integrated Services in Automation (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; Introductive notions, necessary for TCP/IP applications.

SE-4-15: Real Time Operating Systems (Lect. Dr. 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 managing mode of interrupts; the presentation of managing mode of files.

SE-4-16: Control of discrete event systems (Lect. Dr. Eng. Dan UNGUREANU)
The main objective of the course is to provide the knowledge and skills required in the control of discrete event systems: understanding general principles of operation and implementation of discrete event systems (DES). Presentation of typical methods for control of discrete event systems. There are approached fundamental concepts regarding supervisors, models and techniques used in implementation of supervisory control of DES and also aspects regarding the usage of automaton and Petri nets formalism in the supervisory modeling and analysis.

SE-4-17: 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.

SE-4-18: Control Systems for Industrial Robots and Machine Tools (Prof. Dr. Eng. Gheorghe-Daniel ANDREESCU)
Industrial robot generation types; Trajectory generation, 2D orthogonal interpolation algorithm, applications for curve generations; Control structure for axis module; 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; Specific hardware interfaces; CNC Machine tools: specifications, comparison with robot control.

SE-4-19: 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.

SE-4-20: Measurement and Interfacing Structures for Control Systems (Lect. Dr. Eng. Sorin NANU)
The course is presenting principles of measurement, signal, flow of information in a control system, structures of data acquisition system, connectivity and busses. The computer hardware, passive and active
components are presented in typical examples of interfacing with processes. In course are included filters, basic of signal processing (Fourier, convolution).

**SE-4-21: Fundamentals of Artificial Intelligence (Lect.Dr.Eng. Dorina PETRICĂ)**


**SE-4-22: C.A.S.E. Tools (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.

**SE-4-23: Software modelling. UML. XML (Lect. Dr. Eng. Florin DRĂGAN)**

The course put the foundations in preparing students for a systematic approach to the development of a software project, in one learning system (UML) allowing the realization of a concept plan for the project and presenting viable solutions to solve some key issues that may arise during the development and integration concepts in XML projects. Knowledge categories: software development project. Competencies percentage: "Understanding and using basic concepts of computer science and computer"-40%, “Design, implementation, testing, evaluation, administration and maintain applications using different languages, technologies platforms and programming”-20%.

**SE-4-24:.NET Technologies (Lect.Dr.Eng. Dorin BERIAN)**

The aim of the course is to provide theoretical and practical skills in medium level and advanced Windows programming using .NET Technologies and Microsoft Visual Basic. The course covers mostly advanced programming aspects of Microsoft Visual Basic .NET: Object Oriented Programming (classes, interfaces, delegates and generics), memory management (garbage collector), XML documents and files, serialization, distributed applications, threads, sockets, Web Services, working with resources and registry, custom controls, reports generation using Crystal Reports.

**SE-4-25: Multimedia Technologies (Lect.Dr.Eng. Dorin BERIAN)**

The aim of this course is to provide theoretical issues and necessary skills to develop multimedia projects using the dedicated software applications used by professionals. The course covers the following chapters: Introduction, Information types (text, sound, image, animation and video), Considerations on the colors and their perception, Hardware devices for multimedia content, Multimedia formats and software applications that handle them: document (PostScript, PDF), graphics (SVG, VML, PGML), bitmap (BMP, PCX, JPEG, GIF, PNG), audio (Wav, MP3, AAC) and video (MPEG, AVI).

**Fifth Year of Study (AAI)**

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


**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 (Prof.Dr.Eng. Constantin VOLOŞENCU)**


**AAI-5-05: Complex Automation (Prof.Dr.Eng. Octavian PROŞTEAN)**

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
(Prof.Dr.Eng. Constantin VOLOSENCU)

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
(Lect.Dr.Eng. Dorin BERIAN)
Objective: to provide knowledge and practical skills about development of medium complexity applications in Visual C++ environment. The course covers the following issues: Windows mechanisms, the Visual C++ environment, user interface design, usual classes in Microsoft Foundation Classes, 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
(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. Lăcrămioara 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 PETRICĂ)
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.

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.

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-5-23: Real Time Operating Systems (Lect.Dr.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.

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.
Faculty of Automation and Computers: 2008 Annual Report

AAI-5-25: Database Programming Technologies (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 (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.

SFF Classification. The interaction between the data flow and the material flow in SFF. The control unit hierarchy in SFF. 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 (Prof.Dr.Eng. Constantin Volosăncu)

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 project is dedicated to designing an operational procedure in accordance with ISO 9000 standards. 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-type control (based on fuzzy logic, RIP method and neural networks). Hybrid systems; Control system’s design considering real technical constrains. The project is dedicated to designing conventional, state-feedback an of interpolative-type control structures for a nonlinear process. Energy non-linearity reflects the limitations of a d.c. electrical drive. The competencies created by the course are: Generating basic design knowledge in the non-linear control systems tackling in to account practical constrains.

AS-1-06: Modern Control Theory 2 (Prof.Dr.Eng. Ștefan Preitl)
Advanced multivariable control design: aproach 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 PROŞTEAN)

AS-1-08: Genetic Algorithms (Prof.Dr.Eng. Lăcrămioara 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.

Second Year of Study (AS)

AS-2-01: Fault Detection and Diagnosis (Prof.Dr.Eng. Constantin VOLOŞENCU)

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. Iosefina MIHUT)
The objective of the course is to present the basic notions and results of matrix computations, three dimensional analytic geometry, as well as differential geometry. The main topics refer to: linear spaces and subspaces, basis and dimension, linear applications and the associated matrix, eigenvalues and eigenvectors, diagonalization, Euclidean linear spaces, the straight line and the plane in 3D space, conics and quadrics, elements of 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: Mechanical Engineering (Assoc.Prof.Dr. Eng. Nicolae HERIȘANU)
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: Measurement Principles, Techniques and Devices (Prof.Dr.Eng. Dan STOICIU)

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-2-16: 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 (SE)
SE-3-01: Management (Assoc.Prof.Dr.Eng. Gabriela PROȘTEAN)
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.

SE-3-11: Marketing (Teach. Assist. Monica TION)
Marketing course present the marketing concept which it’s based on satisfied consumer demands and needs. Also, its presented environment’s marketing components with analyzes firm’s internal and external environment. Is made market share by the main criteria of segmentation; Market search using different methods of search. It is analyzed, consumer behavior in buying decision. In final part it is present the mix marketing’s 4 P: product, price, place, promotion.
Marketing plan with all component steps its discussion theme of marketing course.

Fourth Year of Study (SE)

SE-4-01: 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.

Fifth Year of Study (AAI)

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

AAI-5-16: Biomedical Engineering (Prof. Dr. Eng. Mirela TOTH-TAŞCĂU)
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 and therapy 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, medical robotics.

AAI-5-29: Communication Skills (Assoc. Prof. Dr. Gabriela PROŞTEAN)
“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).
3.2.C Computer and Software Engineering Section

3.2.C.1 Curricula

Computers and Information Technology Specialization (CTI, 4 years)

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<td>17</td>
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<td>Software Project Management (opt.)</td>
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### Computers Specialization (C, 5 years)

#### Fifth Year of Study

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### Master Specialization: Advanced Computer Systems (ACS, 2 years)

#### First Year of Study

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<tr>
<td>02</td>
<td>Mobile Communication Systems</td>
<td>7</td>
<td>28 – – 14</td>
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<tr>
<td>03</td>
<td>Advanced Artificial Intelligence and Cognitive Models</td>
<td>8</td>
<td>28 – – 14</td>
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<td>04</td>
<td>Formal Verification</td>
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<td>28 – – 14</td>
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<td>Distributed Systems Design</td>
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Second Year of Study

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<td>02</td>
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<td>03</td>
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<td>06</td>
<td>Dissertation Thesis (proj.)</td>
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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 CRIŞAN)
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 MIHĂILESCU)
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 CREŢU)
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 VLĂDUŢIU)
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 CREŢU)
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 VLĂDUŢIU)
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 CIOCÂRLIE)
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 (CTI)

CTI-3-01: Computer Networks (Prof.Dr.Eng. Crisan 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.

CTI-3-02: Fundamentals in Computer Engineering (Prof.Dr.Eng. Mircea VLĂDUŢIU)
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.

CTI-3-03: 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.
CTI-3-04: Digital Microsystems Design (Prof.Dr.Eng. Mircea POPA)
The discipline has the following goals: the knowledge of the definition, characteristics, structure and functionment of a digital microsystem, the study of the typical problems which occur when a microprocessor based microsystem is designed and of the typical solutions, the understanding of the controller type circuits and the study of several classic controllers, the study of typical applications and the gain of knowledges in order to design a microprocessor based system. Exemps are given based on the 8086 and 80386 microprocessors and on the classical 8251, 8253 and 8255 circuits. Interrupt systems and DMA are described. Several applications are described.

CTI-3-06: 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.

CTI-3-07: Software Systems Detailed Design (Conf.Dr.Eng. Radu MARINESCU)
The course presents the main concepts, methods and techniques of software engineering, with an emphasis on object orientation development. At the end of the semester the students must be able to apply engineering methods for developing high quality, large-size software.

CTI-3-08: 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.

CTI-3-09: 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, metrixes. Technology; definitions, its science and functions. Information with the classical, algorithmic and quantic meaning.

CTI-3-10: 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.

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

CTI-3-14: Artificial Intelligence Basics (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.

CTI-3-15: Embedded Systems (Prof.Dr.Eng. Mircea POPA)
The discipline has the following goals: the knowledge of the definition, characteristics, structure and functionment of an embedded systems, the study of the typical problems which occur when a microcontroller based microsystem is designed and of the typical solutions, the study of the components and of the main tools used for designing an embedded system, the study of typical applications and the gain of knowledges in order to design an embedded system with a predetermined functionality. Exemps are given based on the 80C51 and on microcontrollers with HCS12 core.

CTI-3-16: Graphics Elements and Human-Computer Interfaces (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.

CTI-3-17: Database (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.
CTI-3-18: Microprocessor Systems (Assoc.Prof.Dr.Eng. Marius MARCU)
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.

CTI-3-19: Computer Engineering (Prof.Dr.Eng. Mircea VLĂDUȚIU)
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.

CTI-3-20: Complexity and Calculability (Prof.Dr.Eng. Marius CRIȘAN)
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.

CTI-3-21: Design and Architecture of Large Software Systems (Assoc.Prof.Dr.Eng. Ioana Sora)
The objective of the course is to familiarize the students with advanced design techniques for large applications. Students will understand specific software architectures of complex applications from different domains and will gain the ability to design applications using architectural styles and patterns.

CTI-3-22: Input-Output Systems (Prof.Dr.Eng. Crișan 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.

CTI-3-23: Semiconductor Memories (Prof.Dr.Eng. Mirecu STRATULAT)
Course contents: Large scale integrated circuits, fixed semiconductor memories, programmable logic devices (PLD), RAM memories, extending memory capacity, other types of semiconductor memories.

CTI-3-24: Computer Networks Programming (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.

Fourth Year of Study (CTI)

CTI-4-01: Input-Output Systems (Prof.Dr.Eng. Crișan 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.

CTI-4-02 Driver design (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.

CTI-4-03: 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.

CTI-4-04: 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.

CTI-4-05: 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.

**CTI-4-06: Compiling Techniques (Prof. Dr. Eng. Horia CIOCÂRLIE)**

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.

**CTI-4-07: 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.

**CTI-4-08: 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.

**CTI-4-09: Computer Aided Design Techniques (Assoc. Prof. Dr. Eng. Doru TODINCA)**

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.

**CTI-4-10: Wireless Communications and Networks (Prof. Dr. Eng. Mircea POPA)**

The discipline approaches the following: basics of wireless communication; architectures and protocols used in wireless communication, global wireless networks; standard wireless networks; choosing a wireless network for a specific site

**CTI-4-11: Concurrent And Event Based Programming (As. Dr. Eng. Dan COSMA)**

This course studies the architecture, design, and implementation of concurrent software systems. Process algebras, formal specification, and testing are used as tools in the engineering of concurrent systems; event-based programming frameworks and thread libraries are employed in the implementation of such systems.

**CTI-4-12: Database Systems (Prof. Dr. Eng. Ionel JIAN)**

Relational and Object-Relational database design and implementation principles are shown. Oracle SQL server, SQL+ and SQL developer is used for create, update, delete and accessed information stored in database tables. View concept, grant privilege and roles is used for database security. Database integrity in concurrent access environment is realised with constraints and triggers definition and transactions use for assured database consistency. For programmes implementation, Oracle PL/SQL language is used for control blocks, procedures and functions definitions and control exceptions. Oracle Forms&Reports Developer exploits some of the powerful features available for easy design graphical interface with Windows object and PL/SQL trigger, for database access and applications design. With Application Server web access database is realised.

**CTI-4-13: Hardware/ software codesign (Prof. Dr. Eng. Mircea VLADUŢIU)**

This course tackles the fundamental principles of electronic 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.

**CTI-4-15: Reconfigurable computing (Lect. Dr. Eng. Lucian PRODAN)**

This course focuses on the basic concepts of reconfigurable computing, together with both hardware and software platforms for reconfigurable computing using FPGA (field programmable gate arrays) devices. Reconfigurable computing draws essential benefits from FPGA configurations to achieve design modifications in order to implement new functional units that meet hardware and application constraints. The course familiarizes the students with FPGA CAD environments (compilers and high-level synthesis), static and dynamic reconfiguration modes, examples of existing
architectures and applications and new avenues for research.

CTI-4-16: Computer 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.

CTI-4-17: Expert Systems (Assoc.Prof.Dr.Eng. Dan PESCARU)
This course concentrates on main expert system implementing methods. It emphasizes domains for applications, strengths and week 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.

CTI-4-18: Software Project Management (Prof.Dr.Eng. Vladimir CREŢU)
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.

CTI-4-19 Performance Evaluation of Computer Systems (Prof.Dr.Eng. Stefan Holban)
The course presents a compilation of techniques used in modelling a computer system. Among those techniques: Markov chains, stochastic processes, probabilistic risk assessment and modeling of a Petri Network.

CTI-4-20 Software Quality Assurance (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.

CTI-4-21 Multimedia Systems (Assoc.Prof.Dr.Eng. Mihai MICEA)
The course focuses on providing the students a comprehensive set of knowledge on the basic principles and techniques involved in multimedia production. The main information transmission media (text, sound, graphics and images, animation and video) are studied, along with elements of interactivity and design, required by professional multimedia presentations. The students will also gain abilities to use specialized multimedia production workstations and applications.

CTI-4-22: 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 give on checking computing structures for defects and assessing their reliability levels.

CTI-4-23: Fuzzy logic and applications (Assoc.Prof.Dr.Eng. Doru TODINCĂ)
At the end of this course, students will be able to: Describe and compute vague concepts using fuzzy sets and fuzzy logic; design fuzzy rules and perform fuzzy reasoning on them and illustrate the organization, design and operation of some common fuzzy systems

Fifth Year of Study (C)
C-5-01: Computer Network Design (Prof.Dr.Eng. Crişan 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-5-05: 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. Horățiu 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 CRİŞAN)
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 CREŢU)
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 CIOCĂRLEI)
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 week 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. Ioan 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 ŞORA)
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 VLĂDUŢIU)
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 date 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 TODINCA)
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)
The 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.

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 CRIŞAN)
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 VLADUȚIU)
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.

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 TODINCĂ)
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 CRIŞAN)
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 VLADUȚIU)
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 CRETU)
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 CIOCĂRLIE)
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 ŞORA)
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. Ştefan 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 CREŢU)
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 VLĂDUIŢU)
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, orthogonal 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 NĂSLĂU)  
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 PETRIȘOR)  
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 IONEŁ)  
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, Mihai TRASCĂU)  
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, Ailimpie 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 (CTI)**

**CTI-3-05: Management**  
(Assoc.Prof.Dr.Eng, Gabriela PROŞTEAN)  
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.
CTI-3-13: Marketing (Prof. Dr. Eng. Anghel Tăroată)
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 their 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 strategic planning.
### 3.2.1 Informatics Section (3 years)

#### 3.2.1.1 Curricula

#### First Year of Study

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<tr>
<th>Nr. “xx”</th>
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<td>03</td>
<td>Introduction to Computer Programming</td>
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<td>04</td>
<td>Logic and Discrete Structures</td>
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<td>Computer Fundamentals</td>
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#### Second year of study

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<td>Information Security</td>
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<td>03</td>
<td>Formal languages and compiling techniques</td>
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<td>Banking Information Technology</td>
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<td>09</td>
<td>Reconfigurable computing: principals and applications</td>
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<td>Compiler Design</td>
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3.2.I.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. Lăcămioara 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 CRIŞAN)**
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 VLADUŢIU)**
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/subtracters, 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)**

**IF-1-13: Data Structures and Algorithms (Lect.Dr.Eng. Dorina PETRICĂ)**
Fundamental concepts regarding the data structure and structured programming. Fundamental data types and structured data types. Notions about algorithms.

**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.

**Second year of study (IF)**


**IF-2-02: System Theory (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; Introducing in stability, controllability and observability analysis theory and its using for linear systems. Understanding of some task for programmers. The competencies created by the course are: Generating interpretation, analysis and design skills by using knowledge from other fundamental courses for modeling and analysis of physical systems.

**IF-2-03: Object-oriented programming (Prof. 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.

**IF-2-04: Algorithms Analysis (Prof.Dr.Eng. Vladimir CREŢU)**

*Content:* tree data structure, binary, trie, AVL, optimal, Huffman, B trees, design, analysis and performance of specific tree algorithms; set data structure, implementation of set ADT with higher level data structures, union-find sets; graph data structure, weighted graphs, oriented graphs, design, analysis, complexity and performance of specific graph algorithms.

**IF-2-05: Digital Microsystems Design (Prof.Dr.Eng. Mircea POPA)**

Introduction, microprocessor’s structure, digital microsystem’s structure, 280 microprocessor, buses, interrupts, microprocessor programming, memories, input/output ports, connecting memories and input/output ports to the processor, memory and input/output spaces extensions, programmable dedicated circuits, serial interface, 8251 and 280 SIO circuits, parallel interface, 8255 and 280 PIO circuits, timer/counter type interface, 8253 and 280 CTC circuits, microcontrollers, applications: connecting leds, switches, minikeyboards and 7 segment displays to the processor.

**IF-2-06: Fundamentals of Software Engineering (Prof.Dr.Eng. Ioan JURCA)**

Software engineering definition and software main characteristics; software system modeling and requirements specification, requirements specification methods; object oriented design, prototyping, user interface design; software developments environments; software verification and validation; importance of software products documentation; elements of software projects management.

**IF-2-10: Information Security (Prof.Dr.Eng. Daniel-Ioan CURIAC)**

The main focus of the course will be 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.

**IF-2-11: Computer Networks (Prof.Dr.Eng. Ioan SILEA)**

The subject Computer Networks has in view the transmission of theoretical and practical knowledge in the domain of the interconnection of the equipment capable to switch digital information. It starts with the definition and classification of such communication structures, followed by the presentation of the theoretical standardisation and development model, of
the basic architecture and topologies, of the protection and management methods. A project that is based on the client-server model and the laboratory use has the goal to strengthen the theoretical knowledge and to develop practical skills.

**IF-2-12: Database (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).

**IF-2-13_1: 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.

**IF-2-13_2: Fundamental Concepts of Programming Languages (Prof.Dr.Eng. Horia CIOCARLIE)**

The object of course is to study the programming languages. We are not interested in a particular programming language; we are not interested in learning to program with one language or another. But 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.


Small size industrial project using object oriented programming. UML diagrams used for the analysis and specification of requirements. Class, sequence and state UML diagrams. Coding using OOP techniques. Testing using Junit. RDBMS, SVN, WEB specific technologies.

**Third year of study (IF)**

**IF-3-01: User Interface design and graphics (Prof.Dr.Eng. Lăcrămioara STOICU-TIVADAR)**

Objective: Building and developing the capacity of analysys, design and development of user centered interfaces for applications. Content: The objectives of a user regarding the application interface. Human perception in user interfaces design. Human-computer interface. Visual design principles. Aspects of user interface design for specific domain applications. Methods for design and evaluation of user interfaces. Evaluation methods for interfaces usability.

**IF-3-02: Programming Environments and Technologies (Lect.Dr.Eng. Dorin BERIAN)**

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

The course covers the following issues: Visual Studio .NET environment presentation, Visual Basic language aspects presentation, user interface design, usual and special controls, MDI, SDI and dialog forms, graphics and databases in Visual Basic .NET, special topics (client server applications using sockets).

**IF-3-03: Formal languages and compiling techniques (Prof.Dr.Eng. Horia CIOCARLIE)**


**IF-3-04: Web Programming (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.

**IF-3-05: 3D Graphics (Prof. Dr.Eng. Daniel-Ioan CURIAIC)**

This course has as main objective to offer required knowledge and skills for computer graphics: algorithms, colour representation, visualization and animation. The software technology used to develop the projects is OpenGL.

**IF-3-06: Communication (Dr. Letitia COSTEA)**

The course introduces the students to an array of the main theories of interpersonal and professional communication (axioms and maxims of the communication, speech acts, conflicts, negotiation, leadership, nonverbal and intercultural communication). The seminar focuses on applications of theory to practice (case studies, writing of official
papers, letters, cv etc.) and helps students to improve their communication in personal and professional contexts.

**IF-3-07: Synergetic project 2 (T.Assist.Eng. Oana CĂUȘ)**
Data base design, implementation and testing using several programming languages: MS Access, Dbase, Visual Basic, Visual Foxpro, etc.

**IF-3-08: Banking Information Technology (Prof.Dr.Eng. Daniel-Ioan CURIAC)**
This course has as main objective to offer required knowledge and skills for banking information systems: standards, architectures, security, e-banking, credit scoring, specific software technologies, POS and ATM devices, aso.

**IF-3-09: Reconfigurable computing: principals and applications (Lect.Dr.Eng. Lucian PRODAN)**
The course focuses on introducing the concepts of reconfigurable computing in order to meet the requirements of application-level parallelism. Reconfigurable computers can be customized at the hardware level to perform the required computations directly at this level, therefore overcoming the fixed hardware configurations that are typical to microprocessors and achieve maximum computational efficiency. The course introduces the basics of field-programmable gate arrays (FPGAs) and discusses some reconfigurable computing platforms to highlight their limitations and possibilities for improvement.

**IF-3-10: Compiler Design (Prof.Dr.Eng. Horia CIOCĂRLIE)**
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.

**IF-3-11: Multimedia Programming (Lect.Dr.Eng. Dorin BERIAN)**
The aim of this course is to provide theoretical issues and necessary skills to develop multimedia projects using the dedicated software applications used by professionals. The course covers the following chapters: Introduction, Information types (text, sound, image, animation and video), Considerations on the colors and their perception, Hardware devices for multimedia content, Multimedia formats and software applications that handle them: document (PostScript, PDF), graphics (SVG, VML, PGML), bitmap (BMP, PCX, JPEG, GIF, PNG), audio (Wav, MP3, AAC) and video (MPEG, AVI).

### 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. Iosefina MIHUT)**
The objective of the course is to present the basic notions and results of matrix computations, three dimensional analytic geometry, as well as differential geometry. The main topics refer to: linear spaces and subspaces, basis and dimension, linear applications and the associated matrix, eigenvalues and eigenvectors, diagonalization, Euclidean linear spaces, the straight line and the plane in 3D space, conics and quadrics, elements of 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 PETRIŞOR)**
Course goals: to introduce basic concepts of probability theory and statistical inference relevant for computer science applications. One approaches the following topics: discrete probability space, conditional probability, Bayes rule, discrete and continuous random variables, simulation of random variables, finite state discrete time Markov chains, Poisson processes, and applications; statistical inference: point estimation, confidence intervals, linear regression.
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.

Second Year of Study (IF)

IF-2-06: Management (Assoc. Prof. Gabriela PROŞTEAN)
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.

IF-2-13 Marketing (Teach. Assist. Monica TION)
Marketing course present the marketing concept which it’s based on satisfied consumer demands and needs. Also, its presented environment’s marketing components with analyzes firm’s internal and external environment. Is made market share by the main criteria of segmentation; Market search using different methods of search. It is analyzed, consumer behavior in buying decision. In final part it is present the mix marketing’s 4 P: product, price, place, promotion. Marketing plan with all component steps its discussion theme of marketing course.
3.2.S Master Specialization: Automotive Embedded Software (2 years, in collaboration with Siemens VDO)

3.2.S.1 Curricula

### First Year of Study

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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 CREŢU)**

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-1-04: Automotive Data Communication Systems (Dr. Eng. Bogdan GROZA)**

The main objective is improving student’s theoretical knowledge and practical skills in data communications with practical applications in Automotives. Course graduates will have the skills to identify and solve various communication problems in general purpose information systems and Automotives. The course improves knowledge on software, hardware and networking.

Lecture subjects are the following: data communications basic concepts, data communication equipments survey, overview on network architectures and equipment, automotive data communication: CAN general aspects, protocol, properties and features, physical layers, components, applications and tools, new bus concepts for automotive data communications: LIN, Safe-by-Wire, Audio-video busses (I2C, D2B, MOST, Firewire), RF communication, data control and monitoring: error systems, embedded systems and object-oriented technologies.

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

AES-1-05: 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-1-08: Intelligent Control in Automotive Embedded Systems (Prof.Dr.Eng. Radu-Emil PRECUP)

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

AES-1-01: Embedded Systems 1 (Prof.Dr.Eng. Virgil TIPONUT)
Course contents: Structures and general characteristics of an “embedded” system. Microarchitectures for numerical processing. Interfaces and standard buses used in automotive field. General terms regarding real time “embedded” operating systems. Sensors and transducers used in automotive field.

AES-1-06: Communications Skills (Assoc.Prof.Dr.Eng. Gabriela PROŞTEAN)
"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-2-01: Fault detection and diagnosis (Prof.Dr.Eng. Constantin VOLOŞENCU)

AES-2-02: Advanced Cryptography and Information Security in Embedded Systems (Prof. Dr. Eng. Daniel-Ioan CURIAC)
This course aims to cover advanced techniques of encryption and information. The course covers computational methods, algorithms, architectures combined hardware-software for securing information in embedded systems.

AES-2-04: Multi-agent systems (Prof.Dr.Eng. Radu-Emil PRECUP)
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

<table>
<thead>
<tr>
<th>Staff Name</th>
<th>Curricula</th>
<th>Year of Study</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lect.Dr. Crisanta – Alina MAZILESCU</td>
<td>Education psychology</td>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td>T.Assist. Adela Ionela DINU</td>
<td>Pedagogy</td>
<td>II</td>
<td>1 and 2</td>
</tr>
<tr>
<td>Lect.Dr. Gabriel – Mugurel DRAGOMIR</td>
<td>The Didactic of the Specialty</td>
<td>III</td>
<td>1</td>
</tr>
<tr>
<td>T.Assist. Liliana TODORESCU</td>
<td>Educational Communication</td>
<td>III</td>
<td>2</td>
</tr>
<tr>
<td>Prof.Dr.Eng. Stefan PREITL</td>
<td>The Sociology of Education</td>
<td>IV</td>
<td>1</td>
</tr>
<tr>
<td>Lect.Dr. Gabriel – Mugurel DRAGOMIR</td>
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<tr>
<td>T.Assist. Monica POPESCU-MITROI</td>
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</tbody>
</table>
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 seminar 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 rhythms, 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, Awarded the Grigore Moisil Prize of the Romanian Academy
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Domain: Engineering Sciences – Systems Engineering

Main Research Areas:
- Process Control
- System Identification and Adaptive Systems
- Medical Informatics
- Real-Time Control Systems

4.1.A.1 Research Group in Process Control

Research Team: Prof. Dr. Eng. Stefan Preitl, Awarded the Grigore Moisil Prize of the Romanian Academy, head of the team; Prof.Dr.Eng. Radu-Emil PRECUP; Eng. Claudia-Adina Dragoș, PhD student; Eng. Mircea-Bogdan Rădac, PhD student; Eng. Ion-Bogdan Ursache, PhD student; Eng. Petru Alexandru Clep, PhD student.

Research Fields: Conventional control system structures, 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; signal processing.

Main Activities: Development of conventional and advanced control systems; Signal processing in control systems; Soft computing in industrial applications; Development of control systems for servo systems; Development of control systems for mobile robots.
**Published Papers:**


Research Grants and Contracts:

[1] Research Grant of the National University Research Council (CNCSIS), Type A, no. 98GR, theme 14, code 370. Title: \textit{Analysis and development of intelligent control systems with fuzzy controllers dedicated to servosystems}. Director: Prof. dr. eng. Stefan Preitl (granted value for 2008: 61,600 RON)

Research team: Prof.Dr.Eng. Stefan Preitl – research grant manager, Prof.Dr.Eng. Radu-Emil Precup, MSc student Corina Ardelean.

Fuzzy control is one particular case of nonlinear control techniques. Fuzzy controllers are usually developed heuristically, and the evident necessity for systematic development methods of these controllers has not been covered till now. The iterative techniques are not generally connected to the process models. So they are used in embedded and mechatronic systems applications. The project offers systematic approaches with respect.

The controller structures and software created in the project were tested in servo systems control problems focused on different categories of processes. The experimental results highlight the control system performance enhancement. Approx. 14 papers were presented and/or published in journals and conference proceedings.


Research team: Prof. Radu-Emil Precup – director of PUT partner (P2), Prof. Stefan Preitl, Assoc. Prof. Florin Drăgăan, Lect. Dan Ungureanu-Anghel, Assist. Prof. Daniel Iercan, Assist. Prof. Emil Vojsan, PhD student Petru Alexandru Clep, PhD student Ion-Bogdan Ursache, PhD student Mircea-Bogdan Radac, PhD and MSc student Claudia-Adina Dragoș, MSc student Ioan-Marius Mezin.

The main objective of the project consists in developing new informatics technologies for improving the performances of the embedded systems controlling the power-train of cars equipped with automated gearboxes. The project applies modern modelling and control strategies to the power-train and its subsystems. On these bases, real-time software modules are developed for the embedded systems, yielding much better operation performances than ensured by the currently used solutions (meaning PID regulation).
Several nonlinear and linearized models and low-cost control solutions for an electromagnetic actuator have been proposed and tested in 2008 by the research team at the P2 partner. They include Tensor Product-based models and S functions. The digital simulation results show the control system performance enhancement. Approx. 4 papers were presented and/or published in journals and conference proceedings.


Research team: Prof. Stefan Preitl – research grant manager of Romanian partner, Prof. Radu-Emil Precup – associate research grant manager of Romanian partner, Assoc. Prof. Florin Drăgan, PhD student Ion-Bogdan Ursache, PhD student Petru Alexandru Clep, Assist. Prof. Emil Voian, Assist Prof. Daniel Iercan, PhD and MSc student Claudia-Adina Dragoș.

The grant concerns the analysis, development and implementation of new intelligent fuzzy control structures, design techniques and applications on iterative feedback control. The mathematical support is very complex, and the approach needs a strong cooperation between specialist in mathematic/informatics and control engineers. Consequently, ILC techniques treated by the Romanian partner must be completed by Fuzzy logic techniques. Fuzzy logic is one of the primary research areas at the Hungarian partner.

Fuzzy controllers are developed usually in heuristic manner, and the obvious necessity for systematic development methods dedicated to these controllers has not been covered yet. Also, the sensitivity and stability analysis of fuzzy systems is in permanent actuality.

The two research teams co-organize biannually the International Symposia on Applied Computational Intelligence and Informatics (SACI), in Timisoara, dedicated to the exchange of research results in the field. Approx. 10 joint papers were presented and/or published in journals and conference proceedings.


Research team: Radu-Emil Precup – research grant manager of Romanian partner, Prof. Prof. Stefan Preitl – associate research grant manager of Romanian partner, Assoc. Prof. Florin Drăgan, Lect. Dan Ungureanu-Anghel, PhD student Ion-Bogdan Ursache, PhD student Petru Alexandru Clep, Assist. Prof. Emil Voian, Assist Prof. Daniel Iercan, PhD and MSc student Claudia-Adina Dragoș, PhD student Mircea-Bogdan Rădac.

The grant deals with the development and implementation of new fuzzy control structures and design techniques that employ the stability analysis, the sensitivity analysis with respect to parametric variations of the controlled plants, the predictive control techniques and the fuzzy modelling. Several classes of fuzzy control systems are investigated. It is justified to unify and complement the efforts of the two research teams to contribute to better systematic application-oriented approaches resulting in low-cost fuzzy control systems.
The control solutions created by the two research teams are based on their previous experience. The results are tested in several industrial and non-industrial applications. The laboratory equipment at both partners allows the implementation of fuzzy controllers aiming the illustration of the performance improvements. Approx. 5 joint papers were presented and/or published in journals and conference proceedings.

**Perspective Domains:** Methods for algorithmic design of conventional and intelligent controllers (fuzzy, neural, genetic, sliding mode), Methods for signal processing and computer-aided design of control systems, Analysis and development of Intelligent Systems, Solutions for automatic design of model-free control structures, Control solutions in power systems, electrical drives, general industrial automation, mobile robots.

**Strategic Priorities:** Control systems ensuring desired 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, Derivative-free optimization of control systems, Methods and tools to enable the systematic development of fuzzy control systems.

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Prof. dr. eng. Radu-Emil Precup  
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### 4.1.A.2 Research Group in Renewable Energy, System Identification and Adaptive Systems

**Research Team:** Prof. Dr. Eng. Octavian PROŞTEAN, head of team; Prof. Dr. Eng. Nicolae BUDIŞAN, awarded with the Aurel Vlaicu Prize of the Romanian Academy; Prof. Dr. Eng. Ioan FILIP, T. Assist. Eng. Iosif SZEIDERT, PhD student; T. Assist. Eng. Cristian VAŞAR, PhD student; T. Assist. Eng. Andreea Robu, PhD student.

**Research Fields:** System modelling, 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:** Modelling, 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; Modelling and simulation of systems with neural networks; Development of WECS software; Development of adaptive control structures; Development of data acquisition systems.
Published Papers:


Research Grants and Contracts:

1. National University Research Council (CNCSIS), research grant “Researches regarding the control of new wind aggregates structures, with non-regulated blades and permanent magnet synchronous generator”, Grant Type A, CNCSIS Code 372/2008, Contract no. 98GR/11.06.2008, Director: Prof. Octavian Prostean, PhD, Financial value: 68,000 RON

The proposed project has the research theme, goal and objectives associated to the priority research domains at international level, researches regarding the control of new wind aggregates structures with vertical axis for conversion of renewable energies, with turbine self limiting blades, with non-regulated position. The thematic area concerns the increase of the usage degree of wind energy conversion systems as a non-pollutant energy source, conducting to the reducing of carbon emissions and pollution due to the usage of non-ecological resources (coal/gases/oil energy plants), highly pollutant, in concordance to the global trend of ecologic energy production.

The scientific importance and the fundamental research character of the proposed grant resides from the fact that the researches regard a scientific domain of a real actual interest, the usage of vertical axis wind turbines with non regulated pitch blades and without limiting, with permanent magnet synchronous machines, having controlled rotation through the load, operating optimally, with variable rotation, usable in urban space (roof-top wind generators).

The researches are extremely opportune and focused towards the cost reduction, the performances and efficiency increase, the repayment time period reduction. All those will become possible due to new innovative solutions, among them subscribing the one forecasted within grant researches regarding new elements and structures of the conversion line of wind energy into electrical energy (the elimination of the gear-box, new generator constructions and frequency converters) and respectively new structures and control methods for wind aggregates. The scientific importance is sustained by the new, original proposed solutions, opening the means of effective applicability in the power energy domain, but not only.

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

Strategic Priorities: Study of innovative control systems for wind aggregates: MPPT methods, genetic algorithms; Tools for statistical wind measurement related data, for short-term forecasting used in wind speed prediction based windmill control systems and for simulation of autonomous wind farms aggregates.

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4.1.A.3 Research Group in Medical Informatics

Research Team: Prof. Dr. Eng. Lăcramioara Stoicu-Tivadar, head of the team; Prof. Dr. Eng. Vasile Stoicu-Tivadar; Dr. Eng. Dorin Berian; Eng. Vasile Topac, PhD student, T.Assist.Eng. Raul Robu, PhD student; T.Assist.Eng. Andreea Robu, PhD student, Eng. Romina Pintea, PhD student;
Research Fields: Health Information Systems, E-Health, Telemedicine; Software architectures; Distributed and Mobile Applications.

Keywords: Distributed medical informatics; applied informatics; telemedicine;

Main Activities: Development of mobile applications in medical informatics, Study and development of different solutions for integrated healthcare networks, Implementation of standards in healthcare.

Published Books:


Published Papers:


Research Grants and Contracts:

[1] IBM Central/Eastern Europe, Middle East, and Africa (CEMA) Faculty Awards Program, Analysing solutions for consistent healthcare services that support the continuity of care document representation using an IBM solution for SOA management.

Participants: Lăcrămióara Stoicu-Tivadar, Vasile Stoicu-Tivadar, Dorin Berian, Romina Pintea (“Politehnica” University of Timișoara).

The objectives included: the analysis of the actual state of the art regarding evidence based medicine and the possibility to use SOA approach to the development of the domain, definition of the technical specifications for the proposed system, the development of the core of the application, integrating the specifications of the HL7 standard, the design and development of the HL7 interfaces that will allow the HIS to communicate with adjacent medical systems, inserting the results to the content of a lecture in a master program.

The R&D activities were:

• development of a Computer Cluster (2 Servers, 2 Workstations) for testing & validation of the solution
• Analysis of the WebSphere Business Services Fabric facilities for support in healthcare regarding message communication using HL7 standards;
• implementation
• testing
• dissemination of the results
• development of new Courses and Labs
• running the new developed Courses and Labs
• issuing the conclusions (final common meeting with medical and technical domain people).

The project gathered experiences from the medical and IT domains regarding the implementation of standards for communication of medical messages. The final goal was to ensure interoperability of systems in healthcare that will have as result lower costs on long term and a better clinical practice based on evidence from a large data set. The obtained results will help clients to achieve quicker (less time, less money) and more efficient implementation processes using service-oriented applications. The solution will try to find answers using the IBM key-segments from its offer of services and products: preparing IT infrastructure for SOA and creating SOA specialised on activity domains.

We used a new technological platform – based on SOA that support semantic standards. In the project we will do this research referring to HL7 standard. We intend to work using the IBM products HL7 CDA (Clinical Document Architecture) Builder. We studied and implemented the facilities offered by WebSphere Transformation Extender Pack for HL7, IBM WebSphere Transform Ext Pk HL7 V8.0.1. The hardware support was insured by IBM powerful equipment. The project was financed by IBM Company, as a result of a worldwide competition.


Participants: academic, research and medical organisations and SME’s from București, Timișoara, Iași, Pitești. Local staff: Lăcrămioara Stoicu-Tivadar, Vasile Stoicu-Tivadar, Dorin Berian, Romina Pintea, Raul Robu, Andreea Robu, Vasile Topac, (“Politehnica” University of Timișoara).

The main objective of the project is the development of a tele-support system for elderly people, from medical and social perspective, as well. This system has as a goal the implementation and development of the social and medical support services of elderly people, at their homes, in accordance with the fulfilment of the requirement of this category, to live in their own homes not in asylum. In this way, the project contributes to increase the active live duration of the people, and to optimise the customised management of the way of life of the assisted person.

The planned R&D activities will develop:
• an experimental model for a specific local intelligent unit for the homes of the elderly people
• an experimental model for the Teleassistance Centre
• the telecare network
• the specific database and the required software solutions
• a model of tele-attendance services
• a complete guide of the developed know-how and technology.

The project will contribute to the development of knowledge related to NGN networks, and middleware technologies, to the development of the complex tele-attendance software systems.
2nd Romanian National Research Program SIMIMED – Integrated medical information management system based on HL7 Standard.

Participants: academic and medical organisations and SME’s from Cluj, Timișoara, and Brașov. Local staff: Lăcrămioara Stoicu-Tivadar, Vasile Stoicu-Tivadar, Dorin Berian, Romina Pintea, Raul Robu, Andreea Robu, Vasile Topac (“Politehnica” University of Timișoara).

The main objective of the project is the research, design and implementation of a pilot integrated system development for the management of the patients, human and material resources in a hospital (Hospital Information System – HIS), based on the more advances Standards form the medical informatics domain - HL7, DICOM, EN 13606, adapted to the needs of the Romanian Healthcare system.

The planned R&D activities are:
- The analysis of the actual context and the general design
- The technical specifications definition for the HIS
- The development of the kernel of the HIS, including the compliance with HL7 Standard
- The design and the implementation of the software modules for each medical speciality
- The design and development of HL7-compliant communication interfaces with other Healthcare information systems
- The enlargement of the partnership with other medical organisations in order to implement the results of the project.
- In this way, the project will develop a modular and flexible solution that one can adapt to any Healthcare organisation, and can integrate with other existing Healthcare Information systems.

**Perspective Domains:** Distributed architectures and appropriate technological solutions; Mobile applications and related technologies; Interoperability standards in distributed medical informatics; Solutions for integrated healthcare networks and interoperability.

**Strategic Priorities:** The group intends to develop strategic researches on the directions specified in the domain by the European Community: 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.

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

**Research Team:** Prof. Dr. Eng. Nicolae Robu, head of the team; Prof. Dr. Eng. Gheorghe-Daniel Andreescu; Prof. Dr. Eng. Toma-Leonida Dragomir; Prof. Dr. Eng. Ioan Silea; Lecturer Dr. Eng. Sorin Nana; T.Assist.Eng.Tiberiu Ioniță, PhD student; T.Assist.Eng. Ana-Maria Dan, PhD. Student; T.Assist.Eng. Cristian Schlezinger, PhD student.
Research Fields: Advanced Control of AC drives; Sensorless Control of IPMSM; Fault-tolerant Control; Automotive Electric Actuation Technologies; Applications to Electric and Hybrid Vehicles.

Keywords: Advanced control of electrical drives; Automotive electric actuation; Sensorless direct torque and flux control; State and disturbance observers; Variable structure flux-observer with signal injection; Active flux observer; Fault-tolerance; Fuzzy-interpolating implementation; Wind energy; Real-time implementations.

Main Activities: Control systems in Automotive electric actuation technologies; Development of Sensorless control system with hybrid observer from zero speed for starter-generator with IPMSM for EHV; Sensorless control of high-speed SPMSM; Wind turbine PMSG sensorless control; Real-time implementation and testing using DSpace for Sensorless control system of AC drives; Informatics systems; Solar energy.

Published Papers:


Research Grants and Contracts:


The goal is to develop and propose novel electrical actuators with power electronics and control systems for various functions in automobiles such as: starter/alternator in hybrid electric or electric vehicles; active steering, steering and braking by wire, climate control, independent valve actuation, active suspension damping, etc., need - for comfort improvement, a reasonable energy consumption and robust response. Now, after the first 42Vdc mild hybrid electric Toyota Crown Royal has become commercial in 2002, there is world-wide interest and effort to introduce more and improve power electronic controlled actuators on automobiles.

The project is aiming at the following objectives:

• To develop and validate a 42Vdc battery model and an efficient battery state estimator in order to optimally manage the energy consumption and storage on board of automobiles
• To propose a new power electronics control system for the claw-pole rotor alternator capable to work either at 14Vdc or 42Vdc for more power
• To develop better PMSM actuators and their advanced digital sensorless control with redundancy for active steering, steering-by-wire and electric braking-by-wire
• To develop new linear electric actuators for independent electric valve and active suspension damping control by power electronics for less peak power and energy consumption
• To investigate a novel starter/alternator configuration (Biaxial Excitation Generator for Automobiles-BEGA) and its control, characterized by very large constant power speed range, very low voltage regulation, good efficiency
• To propose and realize innovative small brushless electric actuators (less than 50W at 14/42Vdc) with low-cost electronic supply and control for various automotive accessories, such as: windshield wipers, window lifts, throttle plate control, positioning systems for lights, seats and rear mirrors, fuel injectors, cooling fans, blowers for HVAC, etc., as well as variable-speed pumps for oil, fuel and water. A V/F control with two novel stabilisation loops is proposed for high-speed IPMSM drives.

In 2008 – the final grant year, the main activities and results were to contribute for 4 experimental models realization and to do final experimental tests for all our objectives. There were elaborated the scientific and technical annual research report, and the final report on this subject. The research results have been published in international ISI journals and conference proceedings indexed in international data bases ISI-Proc., IEEE Xplore, INSPEC.


**Perspective Domains:** Automotive control; Advanced control of electric drives, Robotics; Real-time control using LabView; 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; SCADA systems, Applications with solar energy usage.

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

Director: Prof. Dr. Eng. Vladimir CREŢU  
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Faculty of Automation and Computers  
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Tel: +40 256 403255, Fax: +40 256 403214  
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 VLĂDUŢIU  
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2, Vasile Parvan Blvd., 300223, Timisoara, Romania  
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Setup Date: 1982

Research Team:
- Prof. dr. eng. Mircea Vladutiu
- Lecturer dr. eng. Marius Marcu
- Lecturer dr. eng. Lucian Prodan
- Lecturer dr. eng. Mihai Udrescu
- Assist. eng. Versavia Ancusa (PhD Student)
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:


Faculty of Automation and Computers: 2008 Annual Report


Research Grants and Contracts:
[1] Design of Floating Point Units for Interval Arithmetic - contract with CNCSIS - PN II value 25480 RON director Alexandru Amaricai

[2] Simulation Based Reliability Assessment of Quantum Circuits - contract with CNCSIS - PN II value 24800 RON director Oana Boncalo

[3] Dependability estimation for emerging bioinspired systems using hierarchical reconfiguring strategies - contract with CNCSIS value 56640 RON director Lucian Prodan


[5] Bioinspired architectures for reversible and quantum circuits - contract with UPT value 296000 RON director Mircea Vladutiu

Books


4.1.C.2 Research Laboratory of Databases and Artificial Intelligence

Directors: Prof. Dr. Eng. Ştefan HOLBAN
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Setup Date: 1975

Research Team:
- Prof. dr. eng. Ionel Jian
- Prof. dr. eng. Ştefan Holban
- Prof. dr. eng. Marius Crişan
- Assoc. Prof. dr. eng. Dan Pescaru
- Lect. dr. eng. Sorin Babii
- Assist. eng. Cosmin Cernazanu
- Assist. eng. Dan Ciresan

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:
Conference on Automation, Quality and Testing, Robotics (AQTR’08), 158-163, 6 pag., 978-1-4244-2576-1


Books


Research Grants And Projects

[1] *MaternQual – Integrated informatics systems for complex evaluation of obstetrics related risk factors* - contract with Universitatea de Medicina si Farmacie "Victor Babes" din Timisoara – UMFVBT; Universitatea de Vest din Timisoara – UVT; Spitalul universitar de obstetricaginecologie "Dr. Dumitru Popescu" din Timisoara - TM05 Bridgeman srl value 70431 director Prof. Stefan Holban

[2] Intelligent anticipatory agent oriented on decision and e-learning applications - contract with CNCSIS value 15400 RON director Crisan Marius

4.1.C.3 Research Laboratory of Software Engineering

Director: Assoc.Prof.Dr.Eng. Radu MARINESCU "Politehnica" University of Timisoara Faculty of Automation and Computers Department of Computer and Software Engineering 2, Vasile Parvan Blvd., 300223, Timisoara, Romania E-mail: radu.m Marinescu@cs.upt.ro

Setup Date: 1978

Research Team:

Assoc. Prof. dr. eng. Radu Marinescu
Assoc. Prof. dr. eng. Marius Minea
Assist. eng. Călin Jebeleanu
Assist. eng. Cristina Marinescu
Assist. eng. Petru Florin Mihancea
Assist. eng. Adrian Mierlutiu
Assist. eng. Dan Cosma
Assist. eng. Ciprian Chirila

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

**Published Papers:**


5. P. Bulychev, M. Minea, *Duplicate code detection using anti-unification*, Second Spring Young Researchers Colloquium in Software Engineering, St. Petersburg, Russia ,


**Research Grants And Projects**

1. Methods and tools for continuum quality insurance in complex software systems - contract with UEFISCUS value 205515 RON director Marius Minea

2. Distributed Enviroment for Control and Optimisation Characteristics of Distributed Software Systems - contract with CNCSIS/UEFISCUS value 40000 RON director Radu Marinescu


5. Quality assurance in distributed software systems - contract with MCTI value 5617 RON director Marinescu Cristina

6. Timisoara Engineering Center accord - contract with TRW Automotive value 28949 EUR director Marius Minea

7. ARTIST2 – Embedded System Design - contract with EU, FP6 NoE director Marius Minea

8. AVANTSSAR – Automated Validation of Trust and Security of Service-oriented Architectures - contract with EU, FP7 STREP value 24.000 EUR director Marius Minea
[9] Cercetari in domeniul automatizarii procesului de testare software - contract with Oce Software SRL value 12700 RON director Marius Minea
[10] Practical formal verification using automated reasoning and model checking - contract with NTAS, INTAS value 2700 EUR director Marius Minea
[11] Reversed engineering techniques for class hierarchies - contract with CNCSIS value 30000 RON director Mihancea Petru

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

Director: Prof. Dr. Eng. Vladimir CREŢU
"Politehnica" University of Timisoara
Faculty of Automation and Computers
Department of Computer and Software Engineering
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Tel: +40 256 403255, Fax: +40 256 403214
E-mail: vladimir.cretu@cs.upt.ro

Setup Date: 1976

Research Team:
- Prof. dr. eng. Vladimir Crețu, head of the team
- Prof. dr. eng. Mircea Stratulat
- Prof. dr. eng. Mircea Popa
- Assoc. Prof. dr. eng. Mihai Micea
- Assoc. Prof. dr. eng. Ioana Șora
- Assoc. Prof. dr. eng. Doru Todincă
- Assoc. Prof. dr. eng. Marius Marcu
- Lect. dr. eng. Sorin Babii
- Assist. eng. Dan Chiciudean
- Assist. eng. Răzvan Cioarăgă
- Assist. eng. Bogdan Ciubotaru
- Assist. eng. Carmen Holotescu

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 Papers:


Research Grants And Projects

[1] FILOLET Innovative system for electrical energy monitoring based on wavelet transformation for industrial consumers - contract with UEFISCSCU, MEdCI value 20000 RON director Micea Mihai

[2] SICRAMAS: Intelligent system for non-linear management of runner flow with asynchronous engines - contract with UEFISCSCU, MEdCI value 60000 RON director Micea Mihai

[3] CORE-TX: Real-time systems embedded in complex applications of distributed artificial perception, collaborative robotized milieu and intelligent sensor networks - contract with UEFISCSCU, MEdCI value 15000 RON director Mihai V. Micea

[4] MELISSEVS: Development and analysis of an integrated model for collaborative robotized milieu and intelligent sensor networks representation - contract with UEFISCSCU, MEdCI value 162000 RON director Mihai V. Micea

[5] Developing and maintenance of plugging for IP monitoring application in GSM B11 system - contract with Alcatel-Lucent value 12000 RON director Marius Marcu

[6] AI based technologies for the software infrastructure of next generation radio networks - contract with CNCSIS value 24000 RON director director Doru Todinca
Books

4.1.C.5 Researches in Distributed and Real-Time Systems

Director: Prof. Dr. Eng. Ioan Jurca
Computers and Software Engineering Department
Bd. Vasile Pârvan, no 2
300223 Timișoara, Romania
Tel: +40-256-403256
Email: ionel@cs.utt.ro

Setup Date: 1990

Research Team:
Prof. dr. eng. Ioan Jurca, head of the team
Prof. dr. eng. Vladimir Crețu
Prof. dr. eng. Horia Ciocârlie
Assist. eng. Carmen Holotescu
Assist. eng. Sorin Șerău
Assist. eng. Dan Cosma
Assist. eng. Stejărel Vereș
Assist. eng. Adrian Petru Mierluiu
Assist. eng. Ciprian-Bogdan Chirilă
Assist. eng. Georgiana Macariu

Research Objectives:
Programming and distributed processing media
Network protocols
Designing, implementing and testing real-time executives for systems based on various microprocessors
Implementing and testing real-time executives for dedicated applications
Extending real-time concepts in distributed applications
Integrating Enterprise Applications into GRID-Type Networks Using Service-Oriented Software Architectures
Methods, Techniques and Structures for Adaptive Computing Applications in Data Communications Field

Published Papers:


Cosmin Cernazanu-Glavan, *Training Neural Network using input data characteristics*, Advances in Electrical and Computer Engineering, Vol 8, Issue 2, pag.65, 6 pagini, 1582-7445


Research Grants And Projects

[1] eMuCo Embedded Multi-Core Processing for Mobile Communications (STREP), - contract with EU, FP7-EU value 73000 euro director Cretu V, Ciocarlie H

[2] Programming environment for real-time embedded distributed applications - contract with CNCSIS value 22000 director Prof. Horia Ciocarlie

[3] Fatigue studying and modeling in steel and aluminum bearer structures for random trials - contract with CNCSIS value 30000 director Prof. Horia Ciocarlie

4.1.C.6 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  
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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 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

Published Papers:

4.2 Autonomous Research Groups

4.2.A Department of Automation and Applied Informatics

4.2.A.1 Research Group in Applied Systems Theory

Research Team: Prof. Dr. Eng. Toma-Leonida Dragomir, head of the team; Prof. Dr. Eng. Constantin Voloșencu; Lecturer Dr. Eng. Dorina Popescu; Lecturer Dr. Eng. Sorin Nanu; T.Assist.Eng. Ana Maria Dan, Phd Student; T.Assist. Dr. 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; Sensor networks; System identification.

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

Published Books:


Published Papers:


Research Grants and Contracts:

[1] CNCSIS Grant, Code 360, theme no. 205, contract no. 58GR/19.05.06 (continued in 2007 and 2008), *Applied researches to develop virtual instruments for process monitorization, with application to the electrical drives*. Director: Assoc. Prof. dr. eng. Constantin Voloşencu

Contact: Prof. Dr. Eng. Toma-Leonida Dragomir
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For the field “Management of the innovation and creativeness”
Lect. Dr. Eng. Dorina Popescu
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4.2.A.2 Research Group in Process Control


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

Keywords: Chaotic systems; programmable logic controllers; remote control.

Published Books:


Published Papers:


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


Research Fields: Authentication protocols, Provable secure public-key cryptosystems, Foundations of cryptology, number theory, Applied cryptography, security for industrial control systems.

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 Books:

Published Papers:


Perspective domains: DoS resistant authentication protocols; Public-key encryption schemes secure against IND-CCA2 (NM-CCA2) adversaries; The use of cryptographic techniques for assuring security in industrial control systems.

Contact: Lect. dr. eng. Dorina Petrică
PhD student Bogdan Groza
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300223 Timișoara, Romania
Tel.: +40-256-40-3244
Email: dorina.petrica@aut.upt.ro, bogdan.groza@aut.upt.ro

4.2.A.4 Research Group in Biomedical Engineering


Research Fields: Friability of Medical Equipments; Bionics; Medical Diagnosis and Medical Informatics; Artificial Intelligence (Expert Systems and Artificial Neural Networks); Medical Image Processing; Human Hand Prosthesis; Prehension.

Keywords: Cochlear implantation; medical diagnosis; expert systems; human hand prosthesis; prehension.

Published Papers:


Research Grants and Contracts:


[2] PN II Grant 11-066/18.09.2007, Complex system, on NGN support, for tele-assistance, at home, for old persons – TELEASIS, Director: Prof.dr.eng. Lăcrămioara STOICU-TIVADAR


Strategic Priorities: Testing protocols for cochlear implantation; The communication interface between a hand prosthesis and the human body, Decision-making using Bayesian Networks and Markov Chains.

Contact: Lect. Dr. Eng. Loredana M. Ungureanu
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5 Student League of the Faculty of Automation and Computers

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5.1 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.

5.2 What Have We Done in the Last 19 Years?

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


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.
The treasure of Liga AC

The first national festival "Treasure League AC", held in 2008, was meant to be one full of opportunities to create collaboration between members of the National Alliance of Student Organizations in Romania and a change in actions organized by student groups.

This year, the festival has grown and gathered many participants from all over the country. The route was difficult, the competitors were organized in teams of 5 members, covering almost the entire city. The festival had a winning team, one that reached the final and managed to get the best time. It ended with a pool party.

Through this project we were able to offer members representing organizations an opportunity to make friends on a personal level, which will then help their organization, giving him the opportunity to form collaborations in projects carried out, or even to create new projects.

We also managed to form their students the idea of volunteering at a broader level, national level, and to recognize its importance and the importance of student representation in the various players.

iTEC – IT Engineering Contest

IT Engineering Contest (ITEC) is a national festival, held each academic year by Liga AC. Through this project, we managed to provide a formal framework for dialogue centered on the theme of Information Technology (IT) between academia, professional and private high schools, as decisive factors in the training of future specialists in IT.

The ITEC innovation and originality consists in the fact that there are students participating in this festival, specialized companies, teachers, and also pupils from high schools from the country.

The festival takes place in two stages: competition for students and student laboratories.

Programming knowledge of the pupils was tested by three high-difficulty problems, which participants had to solve during the contest which lasted three hours. They were evaluated by faculty of the University "Politehnica" and they managed to get high scores even maximum points.

Participants students had the opportunity to taste a little of the charm of student life, participating in various entertainment activities prepared by the organizers.

Originality evidence was the fact that participants had access in laboratories 24/24 hours, the contest taking place almost continuously for 48 hours. The contestants were evaluated by criteria established by teachers of the Faculty of Automation and Computer Science.

In part two of the festival, the iT3C laboratories took place. Representatives of important companies of the IT market in Western country, such as Softbuild and Microsoft Student Partners, supported labs deployed inside the university.

COSPol

Liga AC is a member of C. O. S. Pol.

Student Convention of "Politehnica" Timisoara (COSPol) was founded in 2002, following the desire of the Polytechnic student organizations to express to the players interacting with, a common opinion, but at the same time to create the premises of a possible good cooperation of representatives of students. The main objective of this organization is to represent and defend the rights and interests of students from Polytechnic University.
COSPol activity was directed mainly to the problems facing our university students who live in the student campus. Thus, even before the start of the academic year, members of COSPol, therefore many of the members of Liga AC, and started to work.

COSPol also organized during the academic year, a meeting between students, student representatives and representatives of Timisoara City Hall, with Mr. Rector Nicolae Robu and mayor Gheorghe Ciuhandu. At this meeting we exposed the student campus issues and the results have not been waited for long.

Throughout the academic year, COSPol held Karaoke Night every Friday evening from 21:00 at Restaurant University "Politehnica". This event was promoted every week and proved to be a success because the restaurant was always full of students on Friday, who came to sing.

**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.