Informatics Education in Romanian Universities in context of Bologna Process

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Higher Education in Romania

- State owned accredited universities: 56
  - 16 in Bucharest
  - 6 in Cluj - Napoca
  - 6 in Iasi
  - 4 in Timisoara
  - …

  (http://www.aracis.ro/institutii_en)

Higher Education in Romania

- Accredited private universities: 27 (+ 5 ?)
  - 13 in Bucharest
  - …
- Temporary Authorized private universities: 21

Alexandru Ioan Cuza University of Iasi

- the oldest higher education institution in Romania: founded on 26th of October 1860
- over 36 000 students and 900 academic staff
- 15 Faculties: Biology, Chemistry, Law, Economics and Business Administration, Sports, Philosophy, Physics, Geography and Geology, Informatics, History, Letters, Mathematics, Psychology and Education Sciences, Orthodox Theology, Roman-Catholic Theology

Alexandru Ioan Cuza University of Iasi

- The ECTS system implemented for 9 years
- The 3-cycle system has been implemented since the academic year 2005-2006
- The Diploma Supplement available in all degrees

- UAIC is the first in the national research ranking based on Shanghai criteria (in 2005, 2006, 2007)

  (http://www.ad-astra.ro/universitati/universities.php)

Alexandru Ioan Cuza University of Iasi

member of:

- EUA - European Association of Universities
- UFAC - Réseau des Universités Francophones
- AU - International Association of Universities
- AUF - Agence Universitaire de la Francophonie
- Utrecht Network
- Balkan Universities Network
- Coimbra Group

Informatics Education in Romanian Universities

- Science Universities:
  - Informatics: Iasi
  - Mathematics and Informatics: Bucuresti, Cluj, Timisoara, Brasov, Craiova etc.
  - Economic Informatics: Iasi, Bucuresti, Cluj, Timisoara, Brasov, Craiova etc.
- Technical Universities:
  - Automatic Control and Computer Engineering
  - Electrical Engineering

Informatics Education in the UAIC

- The Chair of Computing Machines founded in 1965, as part of the Faculty of Mathematics; its first class graduated in 1970
- In 1971 it changed its name to Computer Science (Stiinta Calculatoarelor) and in 1992 the chair became the Faculty of Informatics (http://www.info.uaic.ro)
- Over 50 academic staff, 3 chairs: Informatics Fundamentals and Distributed Computing, Software Systems, Optimization and Artificial Intelligence

Informatics Education in the UAIC

- Bachelor in Informatics (3 years = 6 semesters, over 1000 students)
- The last class on 4 year will graduate in 2008

- Master Programs (4 semester, over 150 students):
  - Distributed Systems
  - Computational Optimization
  - Software Engineering
  - Computational Linguistics
- The number of Master students will increase next year when the first Bologna class will graduate

Informatics Education in the UAIC

- PhD Programs (~ 50 students):
  - Formalisms for Specification of Software Systems
  - Distributed Systems and Concurrency
  - Knowledge Representation and Processing
  - Human Language Technologies
  - Coding Theory and Cryptography
  - Evolutionary Computing
  - Graphs and Combinatory applied in Computer Science

Events

- Iasi:
  - EUROLAN – Summer School on different aspects of Language Processing: Eurolan'93, Eurolan'95, Eurolan'97, Eurolan'99, Eurolan 2001, Eurolan 2003 (Bucharest), EUROLAN 2005: The Multilingual Web: Resources, Technologies, and Prospects, Cluj-Napoca, EUROLAN 2007: "Semantics, Opinion and Sentiment in Text", Iasi
  - FCT'99 : 12th International Symposium on Fundamentals of Computational Theory , 30 August - 3 September 1999 Iasi, Romania
  - ISPDC 2002 – International Symposium on Parallel and Distributed Calculus
  - CIPC 2003 – NATO Workshop on Concurrent Information Processing and Calculability

Events

- Timisoara
  - 9th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing – SYNACS, September 26-29, 2007, http://synasc07.info.uvt.ro/
- Cluj Napoca
  - International Conference Knowledge Engineering Principles and Techniques: KEPT 2007 (June 5-7, 2007)
  - Central European Functional Programming Summer School: CEFP 2007 (June 25-30, 2007), Cluj Napoca

Scientific Publications

- Analele Universitatii din Bucuresti
  Seria Matematica-Informatica
- Studia Universitatis Babes-Bolyai Informatica
  http://www.cs.ubbcluj.ro/~studia-i/
- The Scientific Annals of the Alexandru Ioan Cuza University of Iasi, Computer Science
  http://www.infoiasi.ro/bin/view/Annals/

Accreditation - Institution

- ARACIS: Agentia Romana de Asigurare a Calitatii in Invatamantul Superior (Romanian Agency for Quality Assurance in Higher Education) 2006 http://www.aracis.ro
- 2007 the experimental year for ARACIS: 10 universities evaluated
- ARACIS's tasks in accreditation:
  - to regularly develop the methodology and the accreditation standards
  - to assess and to propose the authorization, respectively, the accreditation of the higher education providers and of their academic programs

Accreditation – Bachelor Programme

- Mission of institution and objectives of a educational programme
- Staff, teaching rooms, labs, library, research
- Curriculum:
  - foundations, specializations, complementary
  - mandatory, optional (elective), facultative
- 3 year = 6 semesters (180 cp)
- 1 semester = 14 weeks (30 cp)
- 20 - 28 hours a week (~50% lectures, ~50 % seminars , labs)
- Students enrolment, exams, diploma supplement
- Management system

ARACIS Recommendations for Bachelor in Informatics

Foundations (including Mathematics): 50 - 60%
Specializations: 25 – 30%
Minor: 10 – 15%

Foundations (ARACIS mandatory)

- Computer Architecture
- Algorithms and Data Structures
- Operating Systems
- Data Bases
- Computer Networks
- Formal Languages and Automata
- Computational Logics
- Graph Algorithms
- Numerical Calculus

Mathematics (ARACIS mandatory)

- Calculus
- Linear Algebra
- Probability Theory
- Statistics

Specialization (ARACIS mandatory)

- Imperative/Procedural Programming
- OO Programming
- Database Systems
- WEB Technologies
- Artificial Intelligence
- Advanced Programming
- Optimization Techniques
- Practice

Bachelor Year 1

Iasi

- Algorithms and Programming
- Computer Architecture
- Logics for Computer Science
- Mathematics (calculus)
- Communications in Electronic Environments
- English for Informatics(2 sem.)

- Object Oriented Programming
- Operating Systems
- Algebraic Foundations of Computer Science
- Probabilities and Statistics
- Hardware Practice

Bucuresti

- Algorithms and Data Structure
- Computer Architecture
- Logics for Computer Science
- Procedural Programming
- Algebra (2 semester)
- Calculus (2 semester)

- Geometry
- Formal Languages and Automata
- Object Oriented Programming
- Graph Algorithms
- English for Informatics

Bachelor Year 1

Cluj

- Computer Architecture
- Programming Fundamentals
- Mathematics Foundations of Computers
- Algebra
- Calculus

- Object Oriented Programming
- Operating Systems
- Algorithms and Data Structure
- Geometry
- Dynamic Systems

Timisoara

- Algorithms
- Programming I
- Informatics Foundations
- Algebra
- Calculus

- Geometry
- Formal Languages and Compilers
- Programming II
- Data Structures
- Computer Architecture

Bachelor Year 2

Iasi

- Data Bases
- Computer Networks
- Formal languages and Automata
- Graph Algorithms
- Elective (Continuous Models, Security and Cryptography, Games Theory)
- English (2 semesters)

- Web Technologies
- Advanced Programming
- Compiler Design
- Individual Project
- Elective (Logic Programming, Functional Programming, Algebraic programming)

Bucuresti

- Computational Geometry
- Calculability and Complexity
- Advanced Programming
- Probabilities
- Web Technologies
- Operating Systems

- Statistics
- Data Bases
- Artificial Inteligence
- Computer Networks
- Logic Programming
- Software Developing Metods

Bachelor Year 2

Cluj

- Advanced Programming
- Distributed Operating Systems
- Data Bases
- Logic and Functional Programming
- Graph Algorithms
- Individual Project

- Software Engineering
- Computer Networks
- Management of Transactions and Distributed Databases
- Artificial Intelligence
- Team Project
- Elective Course

Timisoara

- Graph Theory and Combinatorics
- Operating Systems
- Data Bases I
- Programming III
- Differential Equations

- Computer Networks
- UNIX Operating Systems
- Data Bases II
- Software Engineering
- Elective Course
- Practice

Bachelor Year 3

Iasi

- Techniques for Design and Analysis of Algorithms
- Information Security
- Artificial Intelligence
- Applications Development on .NET Platform
- Elective courses (2)

- Numerical Calculus
- Software Engineering
- Computer Graphics
- Elective courses (3)

Bucuresti

- Differential Equations
- Databases Management Systems
- Web Applications Development
- Simulations Techniques
- Declarative Programming
- Elective course

- Numerical Calculus
- Software Engineering
- Optimization Techniques
- Cryptography and Security
- Compiler Techniques
- Elective course

Bachelor Year 3

Cluj

- Probabilities and Statistics
- Formal languages and Compiler Techniques
- Web Programming
- Elective courses (2)

- Numerical Calculus
- Design and Programming Tools
- Verification and Validation of Software Systems
- Elective courses (3)

Timisoara

- Artificial Intelligence
- Web Technologies
- Probabilities and Statistics
- Individual Project
- Elective course(2)

- Numerical Calculus
- Design and Programming Tools
- Graphic and User Interfaces
- Team project
- Elective course(2)

Students enrollment in UAIC

- 2006:
  - University: 3355 (budgetary) + 4867 (tax) from 15642 candidates (15 faculties)
  - Informatics: 220 + 150 from 721 candidates

- 2007:
  - 3003(budgetary) + 4890 (tax) from 15214 candidates (15 faculties) (32% male, 68% female)
  - Informatics: 196 + 200 (70% male, 30% female) from 875 candidates (70% male, 30% female)

(http://admitere.uaic.ro)

Actions for students enrollment

2006, 2007: Bologna Caravan – A step to Europe

2 Students Organizations, 8 – 10 members

Romanian Students Alliance

2007:
14 towns
20 meetings
>4000 school students

2006:
7 towns
10 meetings
>1500 school students

They talk about:

- The objective of Bologna Process
- The implementation in Cuza University:
  - Student oriented education
  - "You learn what you want, not what we want": in 3rd year every student can choose a complementary specialisation
- European dimension of studies:
  - ECTS
  - Diploma supplement
  - Mobility

GALAȚI

National College
“V. Alecsandri”

- 250 students

SUCEAVA

National College
“Ştefan Cel Mare”

- 360 students

PIATRA NEAMȚ

National College
“Calistrat Hogaş”

- 200 students

Students from Iasi in

- Imagine Cup 2004, SAO PAULO, Brazil:
  - Short Film: First Place: From Romania, Adrian Baragan, Emilian Baragan and Marius Patrascanu of the Faculty of Computer Science of IASI – Romania developed an animated film, "Nostrum Capitulus," that follows the human race from the dawn of civilization to the modern day and beyond -- finally positing that humanity is the greatest of all achievements.

    (http://www.imaginecup.com)

Students from Iasi in imagine cup

- The Imagine Cup 2005 (Japan) Web Development Invitational world champions, winning $8,000, $4,000 and $3,000 (U.S.) respectively, are:

Rank	Team Name	School	Country
1	A.I. Core	Alexandru Ioan Cuza University	Romania
2	Wilsonthe	CCC Kei Yuen College	Hong Kong
3	webbies	Systems Plus College Foundation	Philippines

Students from Iasi in imagine cup

- Imagine Cup 2006 (Delhi, India) Finalists: 181 students from 72 teams representing 42 countries in six categories: Software Design, Algorithm, IT, Short Film, Interface Design and Project Hoshimi (Programming Battle):
  - Project Hoshimi – Programming Battle: Team AIRA from University University A. I. Cuza, Iasi, Romania
  - Interface Designer: Team UniCore from University A. I. Cuza Iasi, Romania

Students from Iasi in imagine cup

- Imagine Cup 2007 Seoul, South Korea: A total of 344 students from 112 teams representing 59 countries and regions were ultimately selected to participate in worldwide Imagine Cup finals in nine categories.
  - IT Challenge
    - First place: China — Zhifeng Chen
    - Second place: France — Romain Larmet
    - Third place: Romania — Ilie Cosmin Viorel (Cuza University)
  - Interface Design (finalist)
    - Austria OOT Graphics Team
    - China Frontfree Studio - UI
    - France Atomnium
    - Romania Blue Pixel Studio (Cuza University)
    - India Avenger's
    - France Time Cube

Thanks for your attention