TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

The Technical University of Cluj-Napoca is one of the twelve top Romanian universities, named "universities of advanced research and education", according to the European Universities Association and Romanian Education, Research, Youth and Sports Ministry hierarchy performed in 2011.

The university has nine faculties in Cluj-Napoca and four in the North Centre of Baia Mare, more than 900 academic staff, more than 22,000 students at the bachelor, master and PhD level. The choice of courses in various technical specialties ranges from mechanical and manufacturing engineering to electrical engineering, telecommunications, computer science and control engineering, from civil engineering to architecture and materials science.

Only on the site of Cluj-Napoca, The Technical University has 14 educational buildings (30 buildings blocks) of which 60 classrooms, 80 seminar rooms, 300 teaching laboratories, 106 research laboratories, 31 library rooms, 7 students hostels with 4000 accommodation places, 2 students canteens.

The Technical University of Cluj-Napoca offers, in accordance with the Bologna Declaration, 4 year programmes for Bachelor's Degrees in Engineering, as well as 2 year programmes for Master's Degrees in Engineering and 3 year PhD Programmes. The Bachelor's Degree in Architecture is awarded through a 6 year programme.

Courses and programmes are offered both in English and Romanian for certain specialisation. If programmes opted for are held in English, a language test is required unless a certificate of a passed TOEFL or Cambridge test is forwarded. If

programmes opted for are in Romanian, the candidate should pass a Romanian-language test. A preparatory year for the intensive study of Romanian language is recommendable in this case.

The research fields of interest cover mainly engineering and technical topics and inter-or multi-disciplinary ones as well. In the Technical University of Cluj-Napoca, high quality applied research is a major task and is carried out by academic staff, PhD students and undergraduates/graduates in the laboratories, belonging to various departments or faculties.


Being dynamical in character, as well as in action, the Technical University of Cluj-Napoca has also committed itself to the international spirit of our time. By means of the permanent involvement in European programmes with various international, European, regional or local partners, our university stands among those academic institutions that are able to attract the interest of the academic community and to integrate in joint activities.

In Romania, undergraduates and graduates of the Technical University of Cluj-Napoca as well as foreign students have the opportunity of being housed in the University managed hostels.

The University offers beds in student hostels in two locations of the town, related to the faculty selected. Students can also rent a room or flat by answering an advertisement in a local paper, a post-it-note on a notice board in the university or estate agencies. The average cost of private accommodation is about 150-250 Euro/month for a one-room flat.

The Technical University owns the Olympic Swimming Complex, the only one in Cluj-Napoca. It consists in 2 swimming pools, one situated in open air and used for the summer period and the other indoor, used mainly in the winter season.
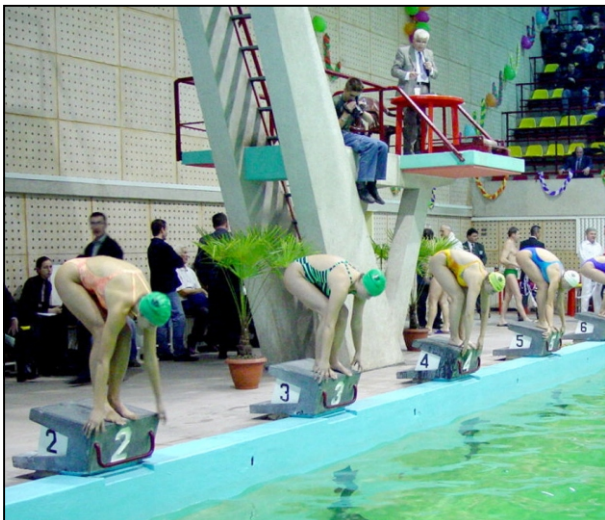
TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

FACULTY OF AUTOMATION AND COMPUTER SCIENCE

COURSE

Automation and Applied Informatics

Bachelor, English Language
Duration: 8 semesters (ECTS)
Entry requirements – High school transcripts of records with major disciplines (maths, physics, informatics – if applicable), Baccalaureate diploma, recommendation letters, SAT recommended, English certificate (Toefl, Cambridge, Oxford) or evaluation at our university.

COURSE DESCRIPTION

Our curriculum is a modern one, aligned with the needs and the trends of today's industry. We offer solid background knowledge, with both formal/theoretical foundation and technological/practical aspects, on a broad area.

The courses have Syllabi aligned to similar courses in North America and Western Europe, and the lectures are based on renowned textbooks.

Our graduates gather the necessary competences for continuing their career path with further education (master and PhD). The range of the skills and competences acquired allow them to have the right profile for a whole range of position in the companies: designer engineer, field engineer, project managers, embedded software developers and management/ executive positions.

Those deciding to continue their education, either complete it with the master and PhD programs here at TUCN, or choose one of the many renowned universities having cooperation agreements with our university.

Our former students have great success in both the academic and business field. They are working all over the world, from top academic institutions (Universities of Barcelona, Torino, Stuttgart, Valenciennes, Delft, etc) to major
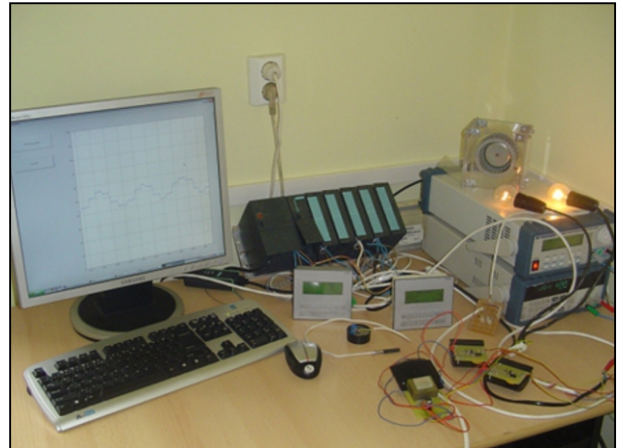
SUBJECTS

YEAR 1

Mathematical Analysis
Linear Algebra and Analytical Geometry
Computer Basics
Logic Design
Computer Programming
Physics
Special Mathematics in Engineering
Electrotechnics
Fundamentals of Electronic Circuits
Chemistry
Foreign languages (English, French, German)
Sport
Object-Oriented Programming (optional)

YEAR 2

Numerical Calculus
Electronic Measurements and Sensors
Analog and Digital Circuits
Data Structures and Algorithms
Databases
Process Modeling
Systems Theory
Signals and Systems
Software Engineering
CAD in Automation
Mechanical Engineering
Microprocessor-based Systems
English (Technical documents elaboration)

TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

SUBJECTS

○ YEAR 3

System Theory
Control Engineering
Discrete-event Systems
System Identification
Power Electronics in Automatic Control
Economic Law
Management and Communication
Real-time Systems
Industrial Informatics
Electric and Electronic Control Equipment
Hydro-pneumatic Control Equipment
Data Transmission
Practical placement
Introduction to Artificial Intelligence (optional)
Formal Languages and Translators (optional)
Software Design (optional)
Structure of Computer Systems (optional)

○ YEAR 4

TRACK A (Automation)
Distributed Control Systems
Robot Control Systems
Continuous Plant Control
Reliability and Diagnosis
Marketing / European Culture and Civilization
Industrial Plant Control
Research and Development Activity
Practical Placement for Diploma Thesis
Electrical Machines and Drives
Microsystems and Data Acquisition
Digital Control of Machine-tools
Optimization
DataBase Design (optional)
Defence of Diploma Thesis

TRACK I (Applied Informatics)
Distributed Control Systems
Robot Control Systems
Continuous Plant Control
Reliability and Diagnosis
Marketing / European Culture and Civilization
Industrial Plant Control
Research and Development Activity
Practical Placement for diploma thesis
Man-machine Interfaces
Application-oriented Software Environments
Computer-integrated Manufacturing
Project Management
DataBase Design (optional)
Defence of Diploma Thesis
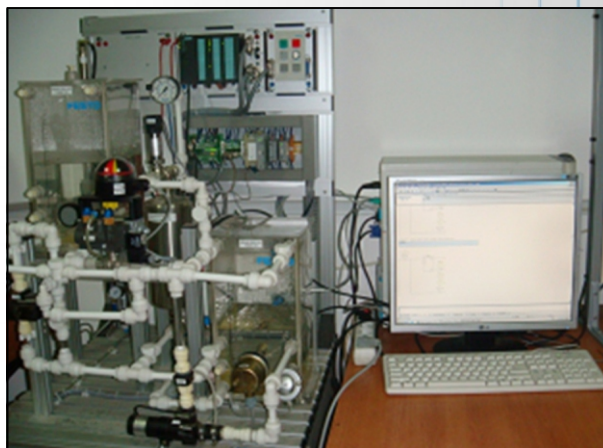
SKILLS AND CAREER

Our graduates are able to solve in real-time, in individual or team activities, the specific problems of their jobs, because they learned to take specific charges in a responsible manner, and to practice effective communication at the institutional level.

In the four years of instruction, they are not only operating with fundamentals of programming, control engineering, process modeling, simulation, identification and analysis methods, but also practice the computer aided design, implementation, testing, operation and maintenance of systems with generic and dedicated equipment (including signal processors, programmable logic controllers, embedded systems and computer networks for control engineering and applied informatics).

The graduates will have also strong skills in different programming languages and techniques.
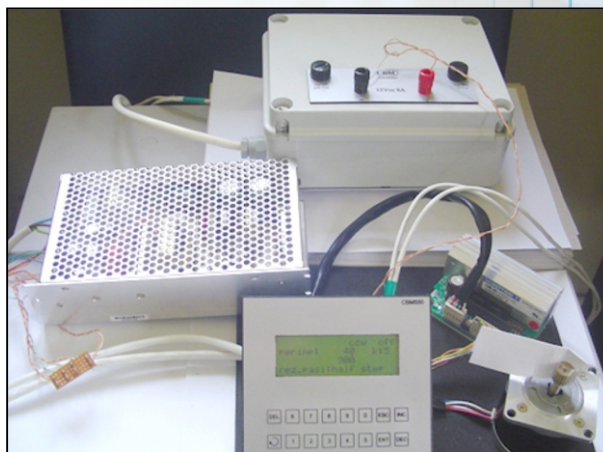
CONTACT

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TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

FACULTY OF AUTOMATION AND COMPUTER SCIENCE

COURSE

Computer Science

Bachelor, English language
Duration: 8 semesters (240 ECTS)
Entry requirements   High school transcripts of records with major disciplines (maths, physics, informatics – if applicable), Baccalaureate diploma, recommendation letters, SAT recommended, English certificate (Toefl, Cambridge, Oxford) or evaluation at our university.

COURSE DESCRIPTION

Our curriculum is a modern one, fully ACM compliant. It is continuously updated, thus remaining effective to face rapid and frequent change in the field.

Courses have Syllabi aligned to similar courses in N America and W Europe, most of them based on the same textbooks.

We offer a solid background knowledge, with theoretical foundation and technological aspects, on a broad area. Our curriculum includes several fundamental disciplines (in the field of mat, physics, and electrical engineering related topics), while the rest consists of 80% software disciplines (basic programming, programming languages, software engineering, data base, networking) and 20% hardware (computer architectures related).

The graduates deciding to continue their education may either complete it with the research-oriented master and PhD programs here at TUCN, or choose one of the best universities in the world (such as: Stanford, Berkeley, Cornell, Toronto, Columbia NY, TU Munchen, ETH Zurich, Lausanne).
You may track some of them on www.cs.utcluj.ro on the Alumni link.
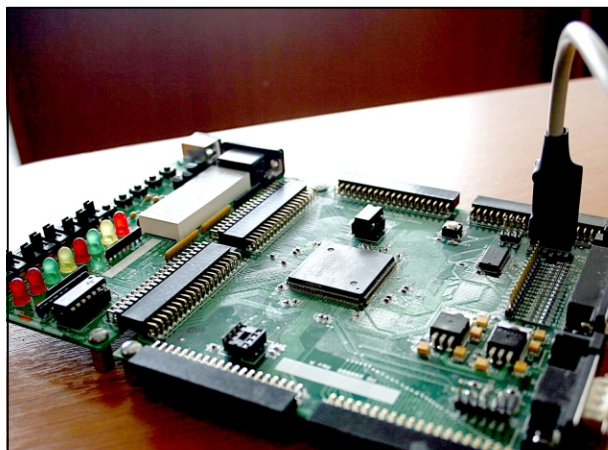
SUBJECTS

YEAR 1

Mathematical Analysis_I (Differential Calculus)
Linear Algebra and Analytical Geometry
Special Mathematics
Logic Design
Computer Programming
Physics
English
Special Mathematics in Engineering
Electrotechnics
Digital System Design
Data Structures and Algorithms
English

YEAR 2

Electronic Measurements and Sensors
Numerical Calculus
Analog and Digital
Object Oriented Programming
Databases
Assembly Language Programming
English I (Technical documents elaboration)
Systems Theory
Computer Architecture
Fundamental Algorithms
Fundamental Programming Techniques
Operating Systems

TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

SUBJECTS

○ YEAR 3
Design with Microprocessors
Logic Programming
Functional Programming
Software Engineering
Introduction to Artificial Intelligence
Economy Legislation
Graphic Processing Systems
Structure of Computer Systems
Formal Languages and Translators
Management and Communication
Image Processing
Software Design
Intelligent Systems
Practical Placement
Robot Control Systems (optional)
Signals and Systems (optional)
Real-time Systems (optional)

○ YEAR 4
Mandatory courses:
Computer networks
Distributed systems
Information systems
Project management
Project Elaboration Methodology
Communication Protocols and Networks
Research and Development Activity
Practical placement for Diploma Thesis
Defense of Diploma Thesis

Elective courses:
Input-output Systems and Peripheral Devices
Parallel and Distributed Computing
Operating Systems Design
User Interface Design
Pattern Recognition Systems
Translators Design
Marketing
European Culture and Civilization
Knowledge Based Systems
Parallel Programming
Database Design
Computer Networks Design
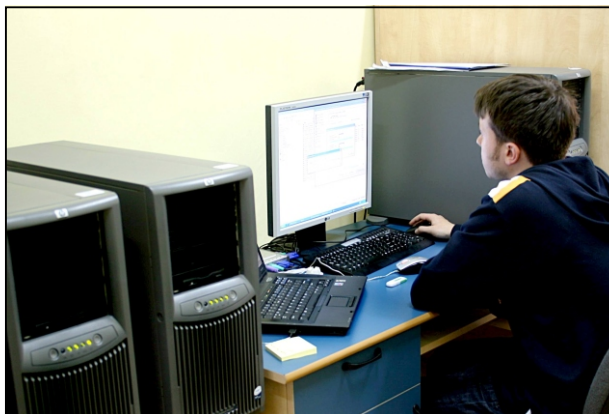
SKILLS AND CAREER

Our graduates gather all the necessary competences for continuing their career path with further education (master and PhD), or to directly enter the job market. The competences acquired allow them to access jobs on a diverse range, from junior developer, to advanced software architect, from technical position up to top management.

The competences are developed in two major directions:

Research: analytical/synthetic skills, innovative/creative solutions for breakthrough domains such as Image Processing, Cloud Computing, Artificial Intelligence, Networking, Computer Graphics, Data and Knowledge Engineering, Hardware Design;

o Industrial: problem identification, analysis, specification, design, implementation, integration, testing of complex computational systems in various fields (such as industrial, administrative, banking, health);

Our former students have great success in both the academic and business field. They are working all over the world, from top academic institutions (like University of Southern California, INRIA, Rutgers University, University of Central Florida, University of Florida, McGill University) to major IT companies (Microsoft, Google, IBM, SDL Language Weaver, Siemens) or important multinational companies (Goldman Sachs, Credit Swiss First Boston, Morgan Stanley, Barkley's Capital).

CONTACT

Professor Rodica Potolea, Dr.Eng., Head of The Computer Science Department
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FACULTY OF CIVIL ENGINEERING

COURSE

Civil, Industrial and Agricultural Buildings

Bachelor, English language
Duration: 8 semesters (240 ECTS)
Entry requirements : High school transcripts of records
with major disciplines (maths, physics, informatics – if
applicable), Baccalaureate diploma,
recommendation letters, SAT recommended, English
certificate (Toefl, Cambridge, Oxford) or evaluation
at our university.

COURSE DESCRIPTION

Practical relevance and a good reputation are the most frequently mentioned reasons for our students' decision
to study at the Faculty of Civil Engineering of Cluj-Napoca.
Our study offers are in line with the market requirements and are based on the changing profiles of
future job market. They provide for individual options in planning one's studies and are continually adjusted to the
market demands.
Our curricula combine theoretical knowledge with applications practiced via projects, lab activities
and site practical work to offer our students the skills and abilities needed on the labor market.
Undergraduate studies conclude with a graduation project and Bachelor degree in science.

SUBJECTS

- **YEAR 1** (main subjects)

    Topography
    Mathematics
    Applied Chemistry and Muilding Materials
    Mechanics

- **YEAR 2** (main subjects)

    Strength of Materials
    Technical Drawing and Infographics
    Reinforced and Prestressed Concrete

- **YEAR 3** (main subjects)

    Statics and Dynamics
    .Computer Assisted Design
    Buildings
    Buildings Technology

- **YEAR 4** (main subjects)

    Steel Structures
    Foundations
    Management in constructions

TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

FACULTY OF CIVIL ENGINEERING

SKILLS AND CAREER

Design Civil Engineer, Commercial Representative in Civil Engineer, Site Engineer, Teacher for undergraduate level;

The Engineer will know the theory of the static and dynamic response of simple and complex structures and numerical solutions. He/she will be able to design concrete structures, masonry structures, steel structures under serviceability and ultimate limit states and he /she will know the design specifications related to standards provisions and fire safety design.

Also, he will know to use the computer in Civil Engineering design. He will know the detailing and drawings for a structure, erection and site detailing, as well as the methods and techniques of strategically planning, project management in constructions, designing of technological processes, mechanization of construction operations.

CONTACT

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Sen. Lect. Cristina Campian, Dr. Eng.   Vice-Dean of Civil Engineering
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For more information visit our site: http://constructii.utcluj.ro/english/

FACULTY OF ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY

COURSE

Programme of study: **Electronics and Telecommunications Engineering**
Courses: **Applied Electronics**
Telecommunications Technologies and Systems
Bachelor, English language
Duration: 8 semesters (240 ECTS)
Entry requirements:
High school transcripts of records with major disciplines (maths, physics, informatics – if applicable), Baccalaureate diploma, recommendation letters, SAT recommended, English certificate (Toefl, Cambridge, Oxford) or evaluation at our university.

COURSE DESCRIPTION

The programme of study offers two courses: Applied Electronics and Telecommunications Technologies and Systems. The first two years, common to both courses, provide general technical knowledge and basic skills in circuit design and analysis. The following two years are dedicated to refining the knowledge and skills, according to the chosen specialization.

The programme of study is based on student-centered education. English versions of the teaching and educational resources are available on-line, as well as printed. The educational process takes place in modern lecture and seminar rooms and laboratories, endowed with specific instrumentation, equipments and cutting edge communications and networking systems. A wide variety of optional and facultative subjects (3rd and 4th year of study) is available, in order to meet the individual educational needs of the students.

Mobility stages at highly rated universities from European countries (France, Finland, Spain, Belgium, Italy, Portugal, Germany, Austria, UK, etc.) can be accessed during the four years of study. The compulsory practical training of the students (min. 200 hours) aims to facilitate the first contact between the students and research or production facilities, in either local or well-known multinational companies.

Professional guidance and counseling for the entire period of studies is provided for the students, by means of a designated tutor.
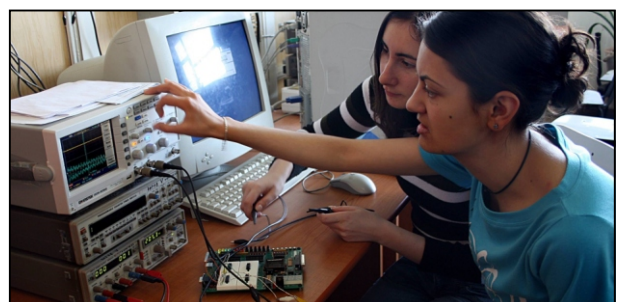
SUBJECTS

○ **YEAR 1**

Mathematical Analysis; Linear Algebra; Elements of Physics; Computers Programming – Languages; Passive Electronic Components and Circuits; Elements of Mechanics and Mechanisms; Foreign Language; Sports; Special Mathematics; Differential Equations; Advanced Physics; Computers Programming – Algorithms; Electronic Devices; Theory of Electric Circuits;

○ **YEAR 2**

Fundamentals of Computer Aided Graphics; Fundamentals of Electrotechnics; Signals Theory; Materials for Electronics; Digital Electronics; Fundamental Electronic Circuits; Discrete Mathematics; Electronic Measurements; Microwaves; Analysis and Synthesis of Circuits; Analog Integrated Circuits; Digital Systems; Computer-Aided Design; Interpersonal and Group Communication; Foreign Language.

TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

FACULTY OF ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY

SUBJECTS

Applied Electronics

○ YEAR 3

Systems with Analog Integrated Circuits; Microprocessors; Optoelectronics; Information Theory and Coding; Data Acquisition System Fundamentals; Software Engineering; Power Electronics; Microprocessor Systems; Electronic Microsystems Technology; Digital Signal Processing; Communication Techniques; Microcontrollers.; Decision and Estimation in Information Processing; Switching and Routing Systems; Radiocommunications; Computer Networks.

○ YEAR 4

Compulsory subjects: Television Engineering; Power Supplies; Sensors and Transducers; Virtual Instrumentation; Project Management; Interpersonal and Group Communication; Practical Training; Research and Design Activities; Practical Work for Graduation Thesis.
Optional subjects: Fuzzy Logic Systems; Elements of Command and Control; Information Processing Technologies; FPGA Systems; Elements of Automated Testing; Digital Image Processing; High Frequency Analog Circuits; System on board; Microelectronics; Data AcquisitionSystems
http://etti.utcluj.ro/download/licenta/EA_eng/ea_eng.htm

Telecommunications Technologies and Systems

○ YEAR 3

Systems with Analog Integrated Circuits; Microprocessors; Optoelectronics; Information Theory and Coding; Modulation Techniques; Software Engineering; Telephony; Microprocessor Systems; Decision and Estimation in Information Processing; Switching and Routing Systems; Radiocommunications; Computer Networks.

○ YEAR 4

Compulsory subjects: Television Engineering; Digital Signal Processing; Internet Protocols; Applied Electronics; Project Management; Interpersonal and Group Communication; Practical Training; Research and Design Activities; Practical Work for Graduation Thesis.
Optional subjects: Cellular Radio-communications; Data Transmissions; Digital Audio-Video Techniques; Mobile Communications; Optoelectronic Systems in Telecommunications; Digital Image Processing; Multimedia Technologies; Media Processors; Digital Speech Processing; Digital Signal Processors
http://etti.utcluj.ro/download/licenta/TST_eng/tst_eng.htm

SKILLS AND CAREER

General skills: Active learning capability; Capability of understanding technological solutions and making decisions based on logic and critical thinking; Ability of understanding technical requirements and solutions proposals; Capability of working in a team; Capability of interaction with specialists from other domains.

Professional skills: Circuit analysis and synthesis; Signal processing and analysis; Computer programming; Analysis, design and implementation of integrated networks and systems; Technology use and development.

The graduates are trained to design, develop, implement and exploit electronics and telecommunications systems, widely used in various aspects of the everyday life.

Career: Graduates are able to choose between working in the industry or going further afield, towards a career in research. Many past graduates currently work in well-known multinational companies (Continental, Siemens, Orange, Vodafone, Infineon, National Instruments, Digilent, Microchip, Alcatel, Hewlett Packard, Intel, Ericsson, Tenaris, etc.).
The technical education received throughout the four years can be further improved, by accessing Master programs, in Romania or other countries.

CONTACT

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TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

FACULTY OF MACHINE BUILDING

COURSE

Robotics

Bachelor, English language
Duration: 8 semesters (240 ECTS)
Entry requirements:
High school transcripts of records with major disciplines (maths, physics, informatics – if applicable), Baccalaureate diploma, recommendation letters, SAT recommended, English certificate (Toefl, Cambridge, Oxford) or evaluation at our university.

COURSE DESCRIPTION

This course is designed to prepare specialists for implementing automation and robotization in a wide range of production sectors, including automotive industry, electronics industry, part manufacturing, food industry, etc. The course benefits of modern labs for all course modules, and a specialized library in English with over 400 book titles on robotics and robot related topics.

Many design projects of robots and robot components are included in the curricula. All lectures and projects are held in English. Opportunities for study exchange in Europe during the course running and final project preparation are available, especially in universities from Italy, Austria, Switzerland, France, Germany and Finland. Studies are concluded with a graduation project and a Bachelor degree in science.
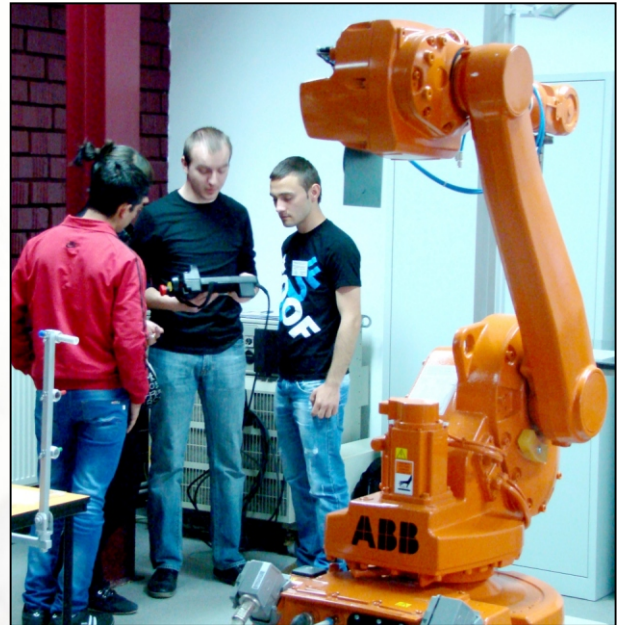
SUBJECTS

- **YEAR 1** (main subjects)
  Applied mathematics
  Physics
  Computer use and programming
  Descriptive geometry and technical drawing
  Materials
  Electrotechnics and electrical machines

- **YEAR 2** (main subjects)
  Material strength
  System theory and automation
  Mechanics
  Mechanisms and machine elements
  Computer aided graphics
  Electronics
  Hydraulic and pneumatic drives
  Electric drives
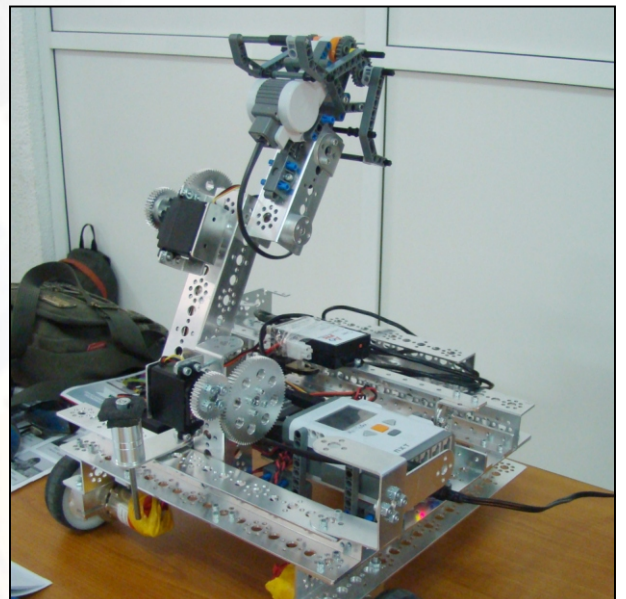
SUBJECTS

○ **YEAR 3** (main subjects)

Machines and equipment in manufacturing systems
Manufacturing technologies
Sensors and data acquisition
Robot mechanics
Flexible manufacturing systems
Robotic engineering
Industrial software

○ **YEAR 4** (main subjects)

Computer integrated manufacturing
Programming and control of CNC machine tools
Manufacturing robotization
Competitive development of robotic systems
Fundamentals of virtual reality
Industrial robot control
Modelling and simulation of robots
Servo hydraulic drives

SKILLS AND CAREER

Graduates of this course will be able to program at the beginner level, to model complex parts in 3D space, to make electrical circuits and simple automation schemes, to command various types of electrical motors, to operate with sensors and with data acquisition systems, to establish and program kinematical and dynamic command functions of robots, to design and plan welding, inspection, handling and assembly robot cells, to develop basic automation projects, to identify, design and implement robot end-effectors, to design and configure a numerical kinematical axes.

The transversal skills include the use of mathematics, physics and applied mechanics in industrial robots modelling, capability for analysis and synthesis, team-working for interdisciplinary projects, use of advanced methods of competitive engineering in product design, as well as skills of leading design teams. Graduates of this course are qualified to get jobs as industrial robot operators, automation engineers, mechanical designers or mechatronic engineers.

CONTACT

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TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
ROMANIA

FACULTY OF MACHINE BUILDING

COURSE

Robotics
Master of Science, English language
Duration: 4 semesters (180 ECTS)
Entry requirements:
Bachelor degree or equivalent degree of long-term studies; English-language certificate.


COURSE DESCRIPTION

This course is designed to prepare specialists for implementing automation and robotization in a wide range of production sectors, including automotive industry, electronics industry, part manufacturing, food industry, etc. The course comprises about 15 modules, 4 semester research projects and a final degree project, scheduled over 2 year period. The course benefits of modern labs for all course modules and a specialized library in English with over 400 book titles on robotics and robot related topics. All professors teaching at this course have international English certificate, PhD degree and international experience in various research projects. All lectures and projects are held in English. Opportunities for study exchange in Europe during the course running and final project preparation are available, especially in universities from Italy, Austria, Switzerland, France, Germany and Finland. At graduation, the MSc degree (180 credits ECTS) is awarded.

SUBJECTS

○ **YEAR 1** (main subjects)
Programming languages of industrial robots
Object-oriented programming languages
PLC programming
Robotic applications
Computer aided robotics
Computer aided manufacturing
Monitoring and control of robotized manufacturing processes

○ **YEAR 2** (main subjects)
Computer aided production planning
Vision systems in robotics
Robotic applications
Production information systems
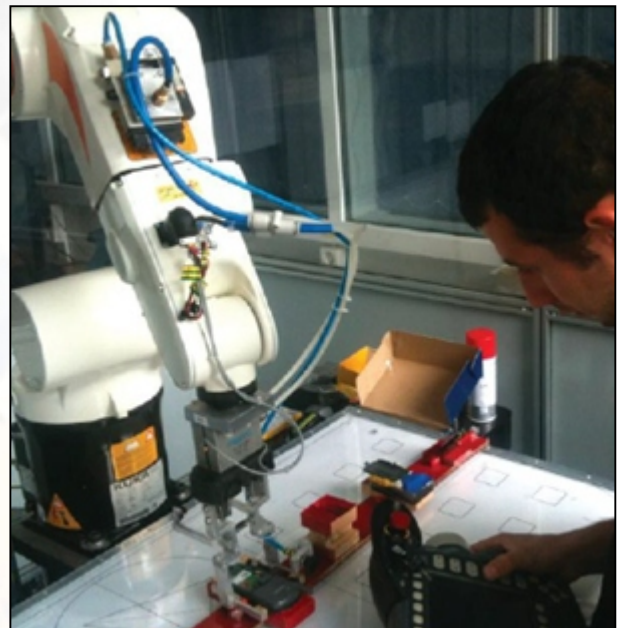
FACULTY OF MACHINE BUILDING

SKILLS AND CAREER

Graduates of this course will be able to program various robotic technologies, to implement industrial robots within production processes, to optimize robot tasks, to develop program applications for process automation using programmable logical controllers, to program applications using object-oriented programming languages, and to use computer aided environments for designing robotized manufacturing systems. In addition, they will know to design modules and mechatronic systems for interfacing robots with industrial processes, to use vision systems in robotics, to apply quality assurance programs, as well as maintenance programs. The transversal skills include ability to develop a research plan and to write a research report, as well as ability to develop an experimental plan. Graduates of this course are qualified to get jobs as robotics engineers, robot operators or automation engineers.

CONTACT

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