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DESCRIPTION

YEAR I

D28TISM101 | Operating Systems
CREDIT POINTS (ECTS): 3
SEMESTER: I
DISCIPLINE TYPE: THOROUGHGOING STUDY
COURSE OBJECTIVES: The course objective is to achieve deep knowledge about the main components of the operating system, especially CPU scheduling, interprocess synchronization and communication, deadlocks avoidance, memory management and file systems. The lab's activities goals are to acquire practical skills needed to develop efficient software applications, using the most important systems calls available in Linux, Solaris, Windows and Java.
CONTENT: Introduction; CPU scheduling; Process synchronization; Virtual Memory; File systems implementation.
TEACHING LANGUAGE: Romanian
EVALUATION: Exam
BIBLIOGRAPHY:
2. Operating Systems Design and Implementation, Andrew S Tanenbaum and Albert S Woodhull, Prentice Hall, 2006;

D28TISM102 | Embedded systems architectures
CREDIT POINTS (ECTS): 4
SEMESTER: I
DISCIPLINE TYPE: KNOWLEDGE
COURSE OBJECTIVES: Acquiring knowledge about:
- Architecture (hardware/software) and operation of typical embedded systems.
- Peripheral resources (I/O devices) architecture and operation for representative microcontrollers families
- Development environments used for application development (hardware, software, simulation, validation)
Development of abilities for selection and conditioning of a microcontroller (computing power, peripherals and other resources, software et.al.) as platform for an embedded system.
Home works and project used to illustrate the development of simple embedded systems applications with an 8 bit AVR microcontroller (Microchip) using an IDE with C programming language and co-simulation for validation.
Other categories of embedded systems: PC controllers and COTS, ETX, COM, PC-104, SOC, etc..
Microcontrollers: introduction, applications, main characteristics, representative families.
Microchip 8 bit AVR family:
- Architecture, CPU, registers, instructions, program and data memories, fuses, clock generation system, reset generation system, I/O ports, timers and counters, analogue inputs, interrupt system, external interrupts.
- Serial communications, USART, USI, SPI, TWI (I2C)
- XMEGA sub-family
- IDEs and programming languages, starter kits and development systems, hardware and software for application programming.
- Introduction to the ARM microprocessor / microcontroller family.
TEACHING LANGUAGE: Romanian
EVALUATION: Exam
BIBLIOGRAPHY:

D28TISM103 | Advanced programming Techniques
CREDIT POINTS (ECTS): 3
SEMESTER: I
DISCIPLINE TYPE: KNOWLEDGE
COURSE OBJECTIVES: The course presents advanced programming techniques useful to specialists in System Engineering. The main objectives of this course are:
- Study of advanced programming techniques
- Making use of technologies dependent on the problem to be solved;
- Developing the methodology of developing the applications specific to each technology.
The project has the role of fixing the theoretical knowledge.


TEACHING LANGUAGE: Romanian

EVALUATION: Exam

BIBLIOGRAPHY:
2. Herbert Schildt, C#, Ed. Teora (traducere, 2002);
3. Karli Watson et al., Beginning Visual C#, Wrox Press Ltd. (2002);
5. Bradley L. Jones, SAMS Teach Yourself the C# Language in 21 Days, (2004);
6. Philip Syme si Peter Aitken, SAMS Teach Yourself the C# Web Programming in 21 Days, (2002);
7. Kris Jamsa si Lars Klander, Totul despre C si C++ Manualul fundamental de programare in C si C++, Ed. Teora, (traducere 2007);

D28TISM104 | Software for image processing

CREDIT POINTS (ECTS): 4

SEMESTER: I

DISCIPLINE TYPE: SYNTHESIS

COURSE OBJECTIVES: The course supports learning outcomes related to computer vision applications, representation and use of information from digital images.


TEACHING LANGUAGE: Romanian

EVALUATION: Exam

BIBLIOGRAPHY:

D28TISM105 | Man-machine interfaces in automotive

CREDIT NUMBER: 3

SEMESTER: I

DISCIPLINE TYPE: SYNTHESIS

COURSE OBJECTIVES: Study of multimodal man-machine interaction systems, through image, or through brain signals. The project has the role of fixing the theoretical knowledge.


TEACHING LANGUAGE: Romanian

EVALUATION: Verification

BIBLIOGRAPHY:
5. C. Vertan „ SISTEME DE CAUTARE A IMAGINILOR PRIN SIMILARITATEA CONTINUTULUI Content-based Image Retrieval (CBIR)”.

**D28TISM106** | Research and design management
---|---
**CREDIT NUMBER:** 3  
**SEMESTER:** I  
**DISCIPLINE TYPE:** SYNTHESIS  
**COURSE OBJECTIVES:** Research and development - introductory notions, classifications, importance. The basics of research. Management of scientific research. Research projects. Design management. EU framework programs for research. Design of complex systems.  
**CONTENT:** Carrying out the research activity, research stages, research management. Developing design activities, design stages, design management.  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Exam  
**BIBLIOGRAPHY:**  
2. Vinătoru M., Conducerea proceselor industriale, Ed Universitaria Craiova, 2005  
5. Maican C., M. Vinătoru, G. Cănureci, Conducerea în regim de defect a grupurilor termoenergetice, Ed. SITECH Craiova, 2011  

**D28TISM107a** | Design and Development Practice 1
---|---
**CREDIT POINTS (ECTS):** 10  
**SEMESTER:** I  
**DISCIPLINE TYPE:** SYNTHESIS  
**COURSE OBJECTIVES:** The students will learn to:  
- Develop design and development activities  
- Sketch a design plan  
- Achieve an advanced individual documentation by using international indexed databases  
- Achieve a preliminary study  
- Use information applications for the achievement of complex projects for embedded systems  
- Use modelling, simulation and design methods dedicated to control systems  
- Implement and evaluate embedded control systems  
**CONTENT:** as appropriate  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Verification  
**BIBLIOGRAPHY:** as appropriate

**D28TISM107b** | Research Practice 1
---|---
**CREDIT POINTS (ECTS):** 10  
**SEMESTER:** I  
**DISCIPLINE TYPE:** SYNTHESIS  
**COURSE OBJECTIVES:** The students will learn to:  
- Develop design and development activities  
- Sketch a design plan  
- Achieve an advanced individual documentation by using international indexed databases  
- Achieve a preliminary study  
- Use information applications for the achievement of complex projects for embedded systems  
- Use modelling, simulation and design methods dedicated to control systems  
- Implement and evaluate embedded control systems  
**CONTENT:** as appropriate  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Verification  
**BIBLIOGRAPHY:** as appropriate

**D28TISM201** | Software structures for real time applications
---|---
**CREDIT POINTS (ECTS):** 4  
**SEMESTER:** II  
**DISCIPLINE TYPE:** SYNTHESIS  
**COURSE OBJECTIVES:** The course presents the basic concepts regarding real-time management and control of processes in the following areas directions: methods and possibilities of development and implementation of a real-time executive, implementation of numerical algorithms for real time processes control, the applications architecture for processes control by using a real-time executive.  
**CONTENT:** Real time computational systems. Basic concepts of real time programming. Primitives for real-time resources management. Implementation of numerical algorithms for processes control. Multitasking operating systems. Principles for achieving a streamlined multitasking executive intended for real time processes monitoring and control. An example of real-time kernel designed by using C++.  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Exam  
**BIBLIOGRAPHY:**  

**D28TISM202** Automotive control

**CREDIT POINTS (ECTS):** 4
**SEMESTER:** II
**DISCIPLINE TYPE:** SYNTHESIS
**COURSE OBJECTIVES:** The course aims at introducing the basic concepts regarding the implementation of automotive control systems: general presentation of the main control systems, AUTOSAR as a design standard in the automotive industry, detailing AUTOSAR, Matlab / Simulink components for design and control of control systems, automatic code generation for electronic control units. The laboratory targets the consolidation of course concepts via modelling, simulation and practical applications.

**CONTENT:** Automotive control systems. Overview of automotive software architectures. Automotive Open System Architecture. Microcontroller Layer; role and functionality. ECU Abstraction Layer; role and functionality. Services Layer; role and functionality. RTE (Run Time Environment); application Layer. Implementation of control systems in automotive.

**TEACHING LANGUAGE:** Romanian
**EVALUATION:** Exam

**BIBLIOGRAPHY:**

**D28TISM204** Virtual Reality and Manufacturing

**CREDIT POINTS (ECTS):** 4
**SEMESTER:** II
**DISCIPLINE TYPE:** SYNTHESIS
**COURSE OBJECTIVES:** The course aims to introduce virtual reality theory, 3D equipment and systems used in the field of virtual reality, modeling, designing and control of virtual processes, the use of virtual manufacturing. The lab and project have the role of fixing the theoretical knowledge and of
allowing virtual modeling and designing to be understood through practical applications.


**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Exam

**BIBLIOGRAPHY:**

**CREDIT POINTS (ECTS):** 4

**SEMESTER:** II

**DISCIPLINE TYPE:** THOROUGHGOING STUDY

**COURSE OBJECTIVES:** Students will learn to:
- formulate the requirements imposed on a data transmission system in process control;
- use design, modeling and simulation methods for data transmission systems;
- evaluate the performance of structures used in data transmissions.

The laboratory and the project have the role to fix the theoretical knowledge and to understand the phenomena through practical applications.


**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Exam

**BIBLIOGRAPHY:**

**D28TISM206b  Research Practice 2**

**CREDIT POINTS (ECTS):** 10

**SEMESTER:** II

**DISCIPLINE TYPE:** SYNTHESES

**COURSE OBJECTIVES:** The students will learn to:
- Develop research activities
- Sketch a research plan
- Achieve an advanced individual documentation by using international indexed databases
- Achieve a preliminary study
- Use information applications for the achievement of complex projects for embedded systems
- Use modelling, simulation and design methods dedicated to control systems
- Implement and evaluate embedded control systems

**CONTENT:** as appropriate

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Verification

**BIBLIOGRAPHY:** as appropriate
D28TISM301 | Networked control systems

CREDIT POINTS (ECTS): 3
SEMESTER: I
DISCIPLINE TYPE: SYNTHESIS
COURSE OBJECTIVES: The course aims at introducing basic concepts for the implementation of distributed control systems in the network: general presentation of industrial networks, delays introduced by control networks, simultaneous design of the task scheduler and the controller.
TEACHING LANGUAGE: Romanian
EVALUATION: Exam
BIBLIOGRAPHY:
1. Matlab/Simulink/RTW and xPC documentation.
2. Quanser documentation
3. TrueTime documentation
4. CAN, LIN network documentation
5. CANoe software ([http://vector.com/vi_canoe_en.html](http://vector.com/vi_canoe_en.html)).

D28TISM302 | Embedded systems design using Matlab-Simulink

CREDIT POINTS (ECTS): 3
SEMESTER: I
DISCIPLINE TYPE: SYNTHESIS
COURSE OBJECTIVES: The course aims at introducing basic concepts regarding the implementation of embedded control systems using Matlab / Simulink: general presentation of Matlab / Simulink / Stateflow, Model-in-the-loop (MIL), Software-in-the-loop SIL), Hardware-in-the-loop (HIL) or Rapid prototyping.
TEACHING LANGUAGE: Romanian
EVALUATION: Exam
BIBLIOGRAPHY:
1. Matlab/Simulink/RTW and xPC documentation.
2. Quanser documentation
3. TrueTime documentation
4. CANoe software ([http://vector.com/vi_canoe_en.html](http://vector.com/vi_canoe_en.html)).

D28TISM303 | Flight control systems

CREDIT POINTS (ECTS): 5
SEMESTER: I
DISCIPLINE TYPE: SYNTHESIS
COURSE OBJECTIVES: Students will learn to:
- use specific flight control methods
- formulate an automated control problem with an aviation application
- use design, modeling and simulation methods for continuous and discrete automated systems with aviation applications
- evaluate the performance of automated structures
The laboratory has the role of fixing the theoretical knowledge and of understanding phenomena through practical applications.
TEACHING LANGUAGE: Romanian
EVALUATION: Exam
BIBLIOGRAPHY:
COURSE OBJECTIVES: The course presents an introduction to the critical information systems and the standards used for software development, with examples in aerospace.


TEACHING LANGUAGE: Romanian

EVALUATION: Exam

BIBLIOGRAPHY:
2. ESA software engineering standards, European Space Agency / Agence Spatiale Européenne, 2008;
4. DO-178B/ED-12B, Software Considerations in Airborne Systems and Equipment Certification, RTCA/EUROCAE;
5. Software Engineering (8th Edition); Ian Sommerville; Addison Wesley; 2004 (biblioteca universității).

D28TISM305 Quality standards in Computer Information Systems

CREDIT POINTS (ECTS): 5
SEMESTER: I
DISCIPLINE TYPE: KNOWLEDGE
COURSE OBJECTIVES: The programme aims at introducing and assimilating the basic concepts, methods and tools in the field of software quality assurance required for assuming leadership roles in the development, management and software maintenance processes.


TEACHING LANGUAGE: Romanian

EVALUATION: Exam

BIBLIOGRAPHY:

D28SAIM306a Design and Development Practice 3

CREDIT POINTS (ECTS): 10
SEMESTER: I
DISCIPLINE TYPE: SYNTHESIS
COURSE OBJECTIVES: The students will learn to:
- Develop design and development activities
- Sketch a design plan
- Achieve an advanced individual documentation by using international indexed databases
- Achieve a preliminary study
- Use information applications for the achievement of complex projects for embedded systems
- Use modelling, simulation and design methods dedicated to control systems
- Implement and evaluate embedded control systems

CONTENT: as appropriate

TEACHING LANGUAGE: Romanian

EVALUATION: Verification
**COURSE OBJECTIVES:** The students will learn to:
- Develop research activities
- Sketch a research plan
- Achieve an advanced individual documentation by using international indexed databases
- Achieve a preliminary study
- Use information applications for the achievement of complex projects for embedded systems
- Use modelling, simulation and design methods dedicated to control systems
- Implement and evaluate embedded control systems

**CONTENT:** as appropriate

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Verification

**BIBLIOGRAPHY:** as appropriate

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**D28TISM403  Ethics and academic integrity**

**CREDIT POINTS (ECTS):** 2

**SEMESTER:** II

**DISCIPLINE TYPE:** SINTHESIS

**COURSE OBJECTIVES:**
- Initiating the students in the field of ethics and academic integrity
- Quantitative and qualitative analysis of the elements specific to ethics and academic integrity
- The integration of the knowledge acquired from other disciplines in the training process of the students in the development of their reports and case studies.

**CONTENT:** Defining academics deviations – sanctions. Problems of ethics in the academic research. The issues of academic plagiarism. Ethics in teaching in the academic environment. University policies that affect the academic environment.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** verification

**BIBLIOGRAPHY:**
6. Sutherland-Smith W., Plagiarism, the Internet, and Student Learning: Improving Academic Integrity, Routledge, 2008.
8. Baca, M. C. & Stein, R. H. (Eds.). Ethical principles, practices and problems in higher...

The European Credit Transfer and accumulation System (ECTS) is basically an academic credit system based on the student workload required to achieve the objectives and learning outcomes of a module or programme of study. It is designed to enable academic recognition for periods of study, to facilitate student mobility and credit accumulation and transfer. The ECTS credit system is recommended for higher education across the Europe. Another benefit is your degree will have the same number of credits no matter what academic discipline you pursue. 2. Where is ECTS credit system used? Every ECTS credit point represents the amount of workload. Few examples of ECTS credits assigned as per degree type includes The credit system of ETH Zurich is based on the European Credit Transfer System (ECTS) and 1 ECTS corresponds to an average workload of 30 hours. 30 ECTS are equivalent to one semester of full-time study. Credit points are assigned to each learning unit according to the expected student workload. Courses are indicated in the Course Catalogue with credit points as well as hours. In general, courses at Master’s level at D-MAVT correspond to 4 ECTS (3-4 hours a week). Credit points are only awarded for successfully completed assessments. Partial awarding of credit points is not permitted.