SUBJECT INFORMATION SHEET
University year 2015 - 2016

Dean,
prof. dr. ing. Daniela Tărniceriu

1. Information on the programme

1.1 Higher education institution	„Gheorghe Asachi" Technical University of Iasi
1.2 Faculty	Electronics, Telecommunications, and Information Technology
1.3 Department	Applied Electronics and Intelligent Systems
1.4 Field of study	Electronic Engineering and Telecommunications
1.5 Study cycle	Bachelor's Degree Studies
1.6 Study programme/ Qualification	Applied Electronics/ Engineer

2. Information on the subject

2.1 Subject name				Applied informatics 2			
2.2 Lecture activities coordinator				Lecturer dr. eng. Aghion Cristian			
2.3 Application activities coordinator				Lecturer dr. eng. Aghion Cristian, Associate Professor dr. eng. Dobrea Dan Marius			
2.4 Study year [1]	1	2.5 Semester[2]	2	2.6 Evaluation[3]	VP	2.7 Type of subject[4]	DOF137

3. Estimated total no. of hours

3.1 Number of hours per week	1	Out of which 3.2 lecture	1	3.3a sem.	-	3.3b applications	-	3.3c project	2
3.4 Total number of hours in the curriculum plan [5]	42	Out of which 3.5 lecture	14	3.6a sem.	-	3.6b applications	-	3.6c project	28

Individual study [6]	Nr. hours
Study based on the manual, the lecture materials, bibliography and notes	20
Additional documentation in the library, on the specialized electronic platforms and in the field	10
Preparing laboratory activities, homework, papers, portfolios and essays	14
Tutorship [7]	5
Exams [8]	5
Other activities - guidance:	-

3.7 Total no. of hours of individual study [9]	54
3.8 Total no. of hours per semester [10]	96
3.9 ECTS	4

4. Prerequisites (if necessary)

4.1 curriculum[11]	• No
4.2 competence	• No

5. Conditions (if necessary)

5.1 for the lecture [12]	• -
5.2 for the applications [13]	• The applications leading to the realization of the project are compulsory. The final exam is conditioned on the completion of the applicative activities and it consists in the presentation of a project on a given subject.

6. Specific competence acquired[14]

			ECTS[15]: **4**	ECTS Distribution[16]
Professional competence	CP1	knowing and using appropriately the terminology specific to microcontroller systems;		0,5
	CP2	knowing and analysing critically the basic elements of an embedded system;		1
	CP3	knowing and using the specific laboratory equipment: signal generators, digital oscilloscopes needed for measuring analogue and digital signals, etc.;		0,5
	CP4	understanding the functioning of devices external to the microcontroller, such as: LCD/7seg. displays, sensor interfacing, etc.		0,5
Interdisciplinary competence	CT1	using effectively the information, communication and professional training resources;		0,5
	CT2	showing interest for professional training by practicing critical thinking and improving their knowledge and skills throughout the activity;		0,5
	CT3	developing teamwork abilities and getting used to working in a space equipped with measurement and control electronic equipment.		0,5
	CTS			

7. Subject goals (resulting from the table of the specific competence acquired)

7.1 General subject goal	Forging the abilities needed in order to approach the design and implementation of the technologies used in electronics for the command and control of various electronic applications.
7.2 Specific goals	1. Acquiring theoretical knowledge on microcontrollers. 2. Completing simple projects by using the internal blocks of microcontrollers (timers, analogical-numerical converter, etc.).

8. Content

8.1 Lecture (syllabus)	Teaching methods	Observations
History, trends, comparison between microcontrollers, microprocessors and FPGAs. Boolean logic.	Presentations, discussions.	
Editing, compilation and simulation environment. Programmer/debugger. Embedded system. Firmware.	Presentations, discussions.	
The internal architecture of an 8 bits microcontroller – introduction.	Presentations, discussions.	
Timers T0 and T1 in an 8 bit microcontroller (MICROCHIP) - introduction.	Presentations, discussions.	
The interrupt system in an 8 bit microcontroller (MICROCHIP) - introduction. The multiplexed Display Method.	Presentations, discussions.	
The analogical-numerical converter - (MICROCHIP) introduction. The architecture and functioning of a direct current brushed motor.	Presentations, discussions.	
Evaluation.	Test	
Selected bibliography: [1] Limbajul C – Tehnici de programare, A. Sîrbu, Editura "Gh. Asachi" Iaşi, 2000. [2] Aplicaţii Practice ale Microcontrolerelor - C. Aghion, O. Ursaru, PIM, Iasi-2009. [3] Silicon Laboratories, C8051F120 şi C8051F340 – Small Form Factor. [4] Programare C şi C++ pentru Linux – Dragoş Acostăchioaie [5] Limbajele C şi C++ pentru începători – vol 1 şi vol 2 – Liviu Negrescu - microInformatica [6] Motorola – AN 1664, Low Cost 3-Phase ac Motor Control System Based on MC68HC908MR24. [7] Microchip – AN857 - Brushless DC Motor Control Made Easy [8] Microchip – AN887 - AC Induction Motor Fundamentals. [9] Microchip – AN900 - Controlling 3-Phase AC Induction Motors Using the PIC18F4431 [10] Microcontroller performance for DC motor speed control system - Ali, Y.S.E.; [11] Phillips Semiconductors 80C51-Based 8-Bit Microcontrollers		
8.2c Project	Teaching methods	Observations
Presentation of the project activity, activity rules, safety measures.	Presentations, discussions.	
Presentation of an editing, compilation and simulation environment (programme). Programme implementation project	Presentations, discussions.	
Presentation of a simulation programme. Programme implementation project	Presentations, discussions.	
C language programming. Output port.	Presentations, discussions.	
Applications on input/output ports.	Presentations, discussions.	
Applications on timers.	Presentations, discussions.	
Applications using timers in interrupt function.	Presentations, discussions.	
Presentation of a 7 segment-digit. 2/4 digit-display.	Presentations, discussions.	
Multiplexed display based on digits with common anode or cathode.	Presentations, discussions.	
Making a digital watch.	Presentations, discussions.	
Control of a brushed direct current motor.	Presentations, discussions.	
Circuits for the supply and control of step-by step unipolar and bipolar motors 1.	Presentations, discussions.	
The analogue-numerical converter.	Presentations,	

	discussions.	
Project evaluation.	Oral presentations of the projects	

Selected bibliography (project):
[1] Limbajul C – Tehnici de programare, A. Sîrbu, Editura "Gh. Asachi" Iaşi, 2000.
[2] Aplicații Practice ale Microcontrolerelor - C. Aghion, O. Ursaru, PIM, Iasi-2009.
[3] Silicon Laboratories, C8051F120 şi C8051F340 – Small Form Factor.
[4] Programare C şi C++ pentru Linux – Dragoş Acostăchioaie
[5] Limbajele C şi C++ pentru începători – vol 1 şi vol 2 – Liviu Negrescu - microInformatica
[6] Motorola – AN 1664, Low Cost 3-Phase ac Motor Control System Based on MC68HC908MR24.
[7] Microchip – AN857 - Brushless DC Motor Control Made Easy
[8] Microchip – AN887 - AC Induction Motor Fundamentals.
[9] Microchip – AN900 - Controlling 3-Phase AC Induction Motors Using the PIC18F4431
[10] Microcontroller performance for DC motor speed control system - Ali, Y.S.E.;
[11] Phillips Semiconductors 80C51-Based 8-Bit Microcontrollers

9. Corroboration of the subject content with the expectations of the epistemic community representatives, professional associations and relevant employers in the field of the study programme

- In establishing the content of the subject, we also consulted curricula used in other national and foreign universities. The subject goals follow closely the curriculum plan, as the subject provides information and trains skills that are necessary for the future specialists in the field of electronics, telecommunications and information technology. The competence acquired will be instrumental for the employees working in the field of microcontroller programming.
- The subject relies on knowledge and methods taught in the subject Computer programming and programming languages 1 , therefore it is adequately placed in the chronology of the curriculum plan.

10. Evaluation

Type of	10.1 Evaluation criteria	10.2 Evaluation	10.3 Weight in the final mark
10.4 Lecture	• Knowledge adequacy • Consistent and coherent presentation and adequate use of the contents taught.	Continuous evaluation[17]:	-
		Homework:	-
		Final evaluation:	30%
10.5c Project	• For evaluation purposes, the student will present a project (on a given subject) based on a microcontroller. The project will be presented on slides (PowerPoint) and the project result can be presented either by simulation (using specific simulation programmes) or practically;	• Oral presentation of the project.	70%
10.5d Other activities[18]	•	•	-
10.6 Minimum performance standard [19]			
• Being marked with the minimum mark 5 both for the project and at the lecture exam.			

Date,
20.05.2016

Subject coordinator,
Associate Prof.dr.eng. Cristian Aghion

Project coordinator,
Associate Prof.dr.eng. Cristian Aghion

Associate Prof. dr. eng. Dan-Marius Dobrea

Date of approval within the department,
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Department Director,
Associate Prof. dr. eng. Irinel-Valentin Pletea

[1] *1-4 penrtru licenţă, 1-2 pentru master*
[2] *1-8 pentru licenţă, 1-3 pentru master*
[3] *Examen, colocviu sau VP A/R – din planul de învăţământ*
[4] *DF - disciplină fundamentală, DID - disciplină în domeniu, DS – disciplină de specialitate sau DC - disciplină complementară - din planul de învăţământ*
[5] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.5, 3.6abc)*
[6] *Liniile de mai jos se referă la studiul individual; totalul se completeaza la punctul 3.7.*
[7] *Între 7 şi 14 ore*
[8] *Între 2 şi 6 ore*
[9] *Suma valorilor de pe liniile anterioare, care se referă la studiul individual.*
[10] *Suma dintre numărul de ore de activitate didactică directă (3.4) şi numărul de ore de studiu individual (3.7); trebuie să fie egală cu numărul de credite alocat disciplinei (punctul 3.9) x 24 de ore pe credit.*
[11] *Se menţionează disciplinele obligatoriu a fi promovate anterior sau echivalente*
[12] *Tablă, vidoproiector, flipchart, materiale didactice specifice etc.*
[13] *Tehnică de calcul, pachete software, standuri experimentale, etc.*
[14] *Competenţele din Grilele G1 şi G1bis ale programului de studii, adaptate la specificul disciplinei, pentru care se repartizează credite (www.rncis.ro sau site-ul facultăţii)*
[15] *Din planul de învăţământ*
[16] *Creditele alocate disciplinei se distribuie pe competenţe profesionale şi transversale în funcţie de specificul disciplinei*
[17] *Se va preciza numărul de teste şi săptămânile în care vor fi susţinute.*
[18] *Cercuri ştiinţifice, concursuri profesionale etc.*
[19] *Se particularizează la specificul disciplinei standardul minim de performanţă din grila de competenţe a programului de studii.*