COURSE DESCRIPTION

1. Program identification information

1.1 Higher education institution	Politehnica University of Bucharest
1.2 Faculty	Faculty of Electronics, Telecommunications and Information Technology
1.3 Department	Department of Applied Electronics and Information Engineering
1.4 Domain of studies	Electronic Engineering, Telecommunications and Informational Technologies
1.5 Cycle of studies	License (engineering)
1.6 Program of studies/Qualification	Applied Electronics

2. Course identification information

2.1 Name of the course				Project 3			
2.2 Lecturer				-			
2.3 Instructor for project activities				Assoc. prof. Alexandru VASILE, Ph.D.			
2.4 Year of studies	IV	2.5 Semester	I	2.6 Evaluation type	Examination	2.7 Course choice type	Mandatory

3. Total estimated time (hours per semester for academic activities)

3.1 Number of hours per week, out of which	1	3.2 course	0	3.3 practical activities	1
3.4 Total hours in the curricula, out of which	14	3.5 course	0	3.6 practical activities	14

Distribution of time	hours
Study according to the manual, course support, bibliography and hand notes	5
Supplemental documentation (library, electronic access resources, in the field, etc.)	23
Preparation for practical activities, homework, essays, portfolios, etc.	5
Tutoring	0
Examinations	0
Other activities	0

3.7 Total hours of individual study	28
3.9 Total hours per semester	42
3. 10 Number of ECTS credit points	3

4. Prerequisites (if applicable)

4.1 curricular	Electronic Devices and Circuits, Physics, Use of general purpose programming languages and microprocessor application-specific programming languages, Basics of Electrical Engineering, Data acquisition methods and signal processing
4.2 competence-based	General knowledge regarding the construction and operation of a system

	and of electronic circuit elements for automation systems, application of basic methods for acquisition and signal processing

5. Requisites (if applicable)

5.1 for running the course	Not applicable
5.2 for running of the applications/project	Compulsory attendance at project meetings (according to regulations governing the Masters Study in PUB).

6. Specific competences

Professional competences	C6. Application, in specific situations, of the basic methods of signal acquisition and signal processing and control of actuators: - Use of specific methods and tools for measuring physical quantities; - Use of software environments for signal analysis and signal processing and for solving control and automation problems.
Transversal competences	Honourable, responsible, ethical behaviour, within the law to ensure the reputation of the profession

7. Course objectives (as implied by the grid of specific competences)

7.1 General objective of the course	The project familiarizes students with the general techniques used for collecting and analysing signals from sensors, signals containing the information needed to make decisions and their implementation using general-purpose software development environments (C, C + +) or dedicated environments. Real phenomena are analysed, and examples are given using typical industrial systems and applications. Such examples will be useful when working on the bachelor thesis.
4.2 Specific objectives	The applications familiarize students with the implementation of general methods for collecting data about physical phenomena using a dedicated software environment (Matlab and Simulink). In particular: - Familiarity with data processing techniques using iterative methods specific to the field of the bachelor thesis.

8. Content

8.1 Lectures	-
8.2 Practical applications	-
8.3 Project	Remarks
Meeting 1. *General notions and technical parameters necessary for the design of a complete electronic subset.* General conditions of operation for electric and electronic equipment. Specific mechanic and climatic conditions. Technical parameters for certain application fields.	2 hours
Meeting 2. The *technical parameters* of primary sensors, smart sensors. Establishing individual project topics, if possible in the field of the bachelor thesis.	2 hours
Meeting 3. *Presentation of an example project*. Parameters and conditions to be met by the electronic system (hardware and software). Chosen technical solutions, motivation.	2 hours
Meeting 4. *Designing the power supply system for the electronic system.* 4.1. Primary energy sources. Adaptors and electronic circuits used for controlling these sources. 4.2. Protection systems and methods, protection circuits for voltage regulators, adapters,	2 hours

power switching devices	
Meeting 5. *Electronic circuits specific to the designed system*. 5.1. Reset systems, initialization system, communication interfaces. 5.2.Computing systems and programming modules 5.3. How to process data from sensors and actuators	2 hours
Meeting 6. *Presentation of representative solutions by students:* components, features, advantages and disadvantages, debate.	2 hours
Meeting 7. *Presentation of individual projects and functional verification of solutions.*	2 hours

9. Bridging the course content with the expectations of the epistemic community representatives, professional associations and employers representatives for the domain of the program

Project development has become a major concern both for the prospective graduates who must develop a bachelor project based on a functional product (designed by each of them) but also for the young engineers who will enter a mature market who experienced a fast-growing rate over the past ten years. The industry is following this trend closely. The industry has a strong demand for qualified engineers with specializations related to applicative industry and with solid fundamentals in electronics, information technology and systems, in order to be able to keep the pace of development of new hardware and software products.

The course syllabus represents a real answer to existing development and evolution requirements of European economy services in the field of Industrial Electronics (IE), military field, industrial automation, robotics (man-machine interfaces) and others.

This provides graduates with the appropriate skills required by current industry demands and with a modern scientific and technical training, both from a qualitative point of view as well as from a competitive one, enabling rapid employment after graduation. This is perfectly framed in the educational policy of Politehnica University of Bucharest, both in terms of content and structure as well as in terms of skills and international openness for students willing to work in the automotive industry.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Weight in the final mark
10.5 Project	- Knowledge of the application of theoretic notions to solve specific problems; - Knowing how to transpose the functioning of a system in a flow chart; - Demonstrate the operation of an implemented system. - Evaluation of the design solutions	Final verification comprising of a theoretical component and a practical component. The theoretical component is verified by checking the specific design solutions; the practical component is assessed by verifying the implementation process for an imposed project topic.	100%

10.6 Minimal performance standard			
- Modelling of a simple real-life analysis problem of an automated system and describing the processing chain needed to solve the problem; - Design, implementation, and functionality demonstration of a simple solution for solving a problem of interest for the applied electronics industry.			

Date Lecturer

01.10.2015 Assoc. prof. Al. VASILE Ph.D.

Date of department approval Director of Department,

07.10.2015 Prof. S. PAŞCA Ph.D.