



„VALAHIA” UNIVERSITY OF TÂRGOVIȘTE

Available from 2019-2020

Faculty: Electrical Engineering, Electronics and Informational Technology
Domain: Electrical Engineering
Study program: Integrated Electrical Systems Engineering in Vehicles
The length of studies: 2 years
Form of studies: daily studies
Code: VUT-MEV

STUDY PLAN

CYCLE II

I. The Mission of the study program

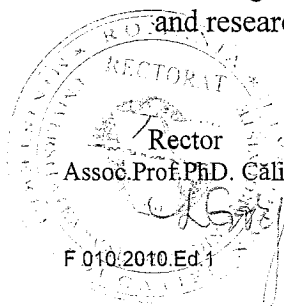
The mission of the international Master's program – **Integrated Electrical Systems Engineering in Vehicles** is that of promoting education and scientific research according to the requests for integration in the knowledge society, regarding consolidation and developing the European Space of Education and European Space of Scientific Research by promoting the great values at the level of all the on-going activities and processes.

II. The aims of study program

The main objective of the study program is training specialists in Electrical Engineering domain and in related domains for electrical engineering systems integrated in vehicles, able to make designing, expertise, sustainability, project management activities in electrical systems for electrical vehicles, as well as scientific and didactic research in university education.

The general aims of study program:

- Creating of a pole of higher education and research in electrical engineering domain.
- Forming specialized human resources for professional activities in the field, with research skills for doctoral studies.
- Adapting the offer of courses in the master's program and scientific content of disciplines at the needs of national and international industry.
- Upgrading the teaching and professional activities and correlating them with those in the international area of higher education and research.
- Ensuring conditions needed to participate in international networks and programs of training and research in the domain.



Rector
Assoc.Prof.PhD. Călin D. Oros

Dean
Assoc.Prof.PhD. Henri-George Coandă

Department Director
Assoc.Prof.PhD. Elena-Otilia Virjoghe

The specific aims of study program:

- Ability to develop studies, reports and synthesis of documentation, respectively technical-economic on the subject of electrical systems integrated in vehicles;
- Ability to solve specific problems in the field of electrical systems integrated into vehicles by integrating, associating and synthesizing the acquired knowledge
- Knowledge of elements (notions, principles, concepts, methods, components, systems, equipment, installations, regulations, policies) specific to the field of electrical systems integrated in vehicles;
- Ability to efficiently exploit existing resources under certain deadlines imposed to solve tasks, even in new situations
- Ability to adapt and be self-taught in new techniques, technologies, concepts.
- Creation of managerial engineering capacities for initiating, planning, executing and controlling projects in the field of electrical integration for vehicles;
- Knowing the basic concepts of the functioning of European financial instruments

III. Requirements for graduation:

- Credits for compulsory and optional subjects: 120 (compulsory subjects: 110; optional courses: 10)
- Defending and passing of the dissertation exam: 10

IV. Structure of academic year (number of weeks):

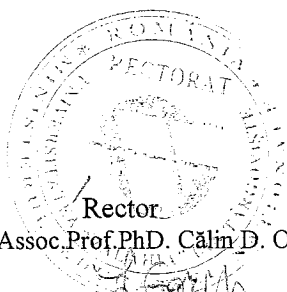
Study Year	Didactic activities		Exam session			Practice	Holidays		
	Sem. I	Sem. II	Winter	Summer	Credits cover		Winter	Spring	Summer
I	14	14	3	3	2	28**	2+1*	2	12
II	14	14	3	3	2	28**	2+1*	2	-

* one week intersemester

** included in the 14 weeks of each semester

V. No. hours/week

Study year	Sem. I	Sem. II
I	14	14
II	14	14



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VI. How to choose optional courses, conditions.

The option for one of the optional courses is conditional upon:

- the minimum number of students admitted to form study groups, in accordance with Law no. 128/1997;
- the Faculty can draft their group so that it leads to the minimum financial effort required by the manning of the material and teaching.

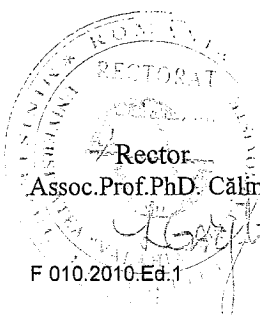
An optional course or an optional module cannot enroll more students than the maximum set by the Faculty Council. If the number of applications exceeds this maximum set by Faculty, the choice will be based on the average results of the previous study year.

VII. Conditions for enrolment in the next academic year.

Students may be enrolled in the first year and second year in accordance with Regulations for the Activity of Students in force.

VIII. Competences

- Elaboration of studies, reports and documentation synthesis on the topic of electrical systems integrated in vehicles, knowing the principles and architecture of vehicles, knowing environmental impact, methods for cooling /heating electrical components in vehicles, knowing composite advanced materials used in specific electrical systems;
- Solving specific research and design problems in the field of electrical systems integrated in vehicles by analyzing, modeling and simulation the control systems, control and automation systems, the components of the electric propulsion system, electromechanical and power electronics, the thermal regime of the subassemblies, proper use of dedicated software and dedicated hardware platforms;
- Solving specific research and design problems in the field of electrical systems integrated in vehicles by knowing the capabilities of electric vehicles in terms of operational safety, development and management of object-oriented software applications, identifying the communication protocols of the transmission systems specific interfaces, data acquisition and processing, vehicles integration in smart grids;
- Solving specific research and design problems in the field of electrical systems integrated in vehicles by knowing sensors and transducers in data acquisition and processing systems, modern measurement methods, data communication technologies, electric and electronic circuits design specific to vehicles;
- Elaboration of research and development projects, technical assistance and consultancy on the specific concepts of systems engineering applied in the vehicle industry, proper use of modeling resources, testing and numerical simulation of the components behavior of electrical systems integrated in vehicles.
- Developing the understanding capacity of concepts, methods and analysis techniques specific to electrical systems engineering applied in different vehicle architectures;
- Knowledge of operating systems and support hardware platforms for intelligent control of the electrical systems integrated in vehicles specific processes;
- Developing the individual and teamwork capabilities to carry out design-specific tasks, virtual testing and vehicle electrical systems design.



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IX. Study Plan / semester

Domain: Electrical Engineering

Study program: Integrated Electrical Systems Engineering in Vehicles

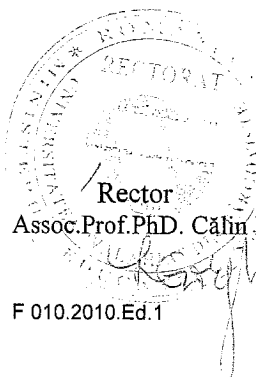
Anul I

Semestrul I

No.	CODE	Discipline	No. Credits	Students Activities (hours)	Individual training of student (hours)	Number of hours						Form of evaluation
						C	S	L	P	Pr/Re	Total	
0	1	2	3	4	5	6	7	8	9	10	11	12
1.	MEV 1 B S 01	Vehicles principles and architecture	4	100	58	2	1	0	0	0	42	E
2.	MEV 1 B C 02	Numerical methods for PDE and applications	4	100	58	1	0	2	0	0	42	E
3.	MEV 1 B C 03	Development and management of object oriented software projects	4	100	58	1	0	2	0	0	42	E
4.	MEV 1 B A 04	Automotive Electronics	4	100	58	2	0	1	0	0	42	E
5.	MEV 1 B A 05	Automotive Operating Systems	4	100	72	0	0	2	0	0	28	C
6.	MEV 1 B S 06	Professional Practice 1	10	250	82	0	0	0	0	12	168	C
Obligatory discipline			30	750	386	6	1	7	0	12	364	4E, 2C
						26						

Semestrul II

No.	CODE	Discipline	No. Credits	Students Activities (hours)	Individual training of student (hours)	Number of hours						Form of evaluation
						C	S	L	P	Pr/Ce	Total	
0	1	2	3	4	5	6	7	8	9	10	11	12
1.	MEV 1 B A 07	Electric propulsion systems for EV	4	100	44	2	0	2	0	0	56	E
2.	MEV 1 B A 08	Methods and devices for advanced measurement systems	4	100	58	2	0	1	0	0	42	E
3.	MEV 1 B A 09	Communications and interconnecting devices	4	100	58	2	0	1	0	0	42	E
4.	MEV 1 B A 10	Integrated data acquisition systems	4	100	72	1	0	1	0	0	28	E
5.	MEV 1 B S 11	Advanced composite materials for automotive industry	4	100	72	0	0	2	0	0	28	C
6.	MEV 1 B S 12	Professional Practice 2	10	250	82	0	0	0	0	12	168	C
Obligatory discipline			30	750	386	7	0	7	0	12	364	4E, 2C
						26						

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Anul II

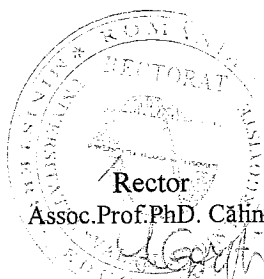
Semestrul I

No.	CODE	Discipline	No. Credits	Students Activities (hours)	Individual training of student (hours)	Number of hours						Form of evaluation
						C	S	L	P	Pr/Ce	Total	
0	1	2	3	4	5	6	7	8	9	10	11	12
1.	MEV 2 B A 01	Numerical simulation of integrated embedded systems	4	100	78	1	0	1	0	0	28	E
2.	MEV 2 B A 02	Heating / cooling of vehicles components	4	100	58	1	0	1	1	0	42	E
3.	MEV 2 B A 03	Power electronics. Structure and control methods	4	100	58	2	0	1	0	0	42	E
4.	MEV 2 B A 04	Integration of Electric Vehicles in Smart Grids	4	100	58	2	0	1	0	0	42	E
5.	MEV 2 B A 05	Virtual Testing and Validation	4	100	58	0	0	3	0	0	42	C
6.	MEV 2 B S 06	Professional Practice 3	10	250	82	0	0	0	0	12	168	C
Obligatory discipline			30	750	386	6	0	7	1	12	364	4E, 2C
						26						

Semestrul II

No.	CODE	Discipline	No. Credits	Students Activities (hours)	Individual training of student (hours)	Number of hours						Form of evaluation
						C	S	L	P	Pr/Ce	Total	
0	1	2	3	4	5	6	7	8	9	10	11	12
1.	MEV 1 B S 07	Vehicles environmental impact	4	100	58	2	1	0	0	0	42	E
2.	MEV 2 B S 08	Electric vehicles capabilities	3	75	47	1	0	1	0	0	28	E
3.	MEV 2 B S 09	Systems engineering management	4	100	58	2	0	1	0	0	42	E
4.	MEV 2 B C 10	Ethics and academy integrity	4	100	72	1	1	0	0	0	28	C
5.	MEV 2 B S 11	Dissertation thesis writing	5	125	69	0	0	0	0	4	56	C
6.	MEV 2 B S 12	Practice for dissertation writing	10	250	82	0	0	0	0	12	168	C
Obligatory discipline			30	750	386	6	2	2	0	16	364	3E, 3C
						26						

Note: E – exam, C – colloquy
Pr / Re – Practice / Research



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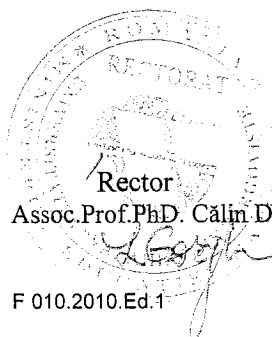
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Indicators

No.	Indicator	Level
1.	Duration of the master's program	M4, 2 years – 4 sem.
2.	Obligatory credits number	120 ECTS
3.	The duration of a semester on didactic activity	14 weeks
4.	Number of hours of didactic activity on week (full-assisted on semesters 1-3)	14 hours
5.	Number of didactic hours (full-assisted and partially assisted activities) for the entire study cycle	1456 hours (728 fully attended hours + 728 partially assisted hours)
6.	Number of teaching subjects in one semester (semesters 1-3)	sem. I – 5 sem. II – 5 sem. III – 5
7.	Number of credits on semester	30 ECTS
8.	Number of credits for one full-assisted discipline	min. 3 ECTS, max. 4 ECTS
9.	The duration of practice (professional or research)	504 hours
10.	The duration of practice for dissertation	168 hours
11.	Number of additional credits for dissertation	10 ECTS
12.	The ratio between number of course hours and number of application hours for full-assisted disciplines	$350/378 = 0.9$
13.	The percentage of exams number in the total number of final evaluations	$15/24 = 62.5\%$
14.	The number of weeks for exam sessions on semester	3 weeks
15.	The number of weeks for the outstanding session	2 weeks



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