SYLLABUS

1. Data about the program of study

1.1	Institution	Technical University of Cluj-Napoca
1.2	Faculty	Electronics, Telecommunications and Information Technology
1.3	Department	Applied Electronics
1.4	Field of study	Electronics and Telecommunications Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Telecommunications Technologies and Systems/ Engineer
1.7	Form of education	Full time
1.8	Subject code	TST-E101.00

2. Data about the subject

2.1	Subject name					Power Supplies					
2.2	Subject area					Electronics Engineering and Telecommunications					
2.3	Course responsible/lecturer					Prof. Dorin Petreus, PhD					
2.4	Teachers in charge of applications					Assistant Prof. Radu Etz, PhD, Assistant Prof. Toma Patarau, PhD					
2.5	Year of study	III	2.6	Semester	1	2.7	Assessment	Exam	2.8	Subject category	DS/ FAC

3. Estimated total time

Year/ Sem.	Subject name	No. of weeks	Course [hours/week]	Applications [hours/week]			Course [hours/sem.]	Applications [hours/sem.]			Indiv. study	TOTAL	Credits
				S	L	P		S	L	P			
III / 1	Power Supplies	14	2		2		28		28		48	104	4

3.1	Number of hours per week	4	3.2	of which, course	2	3.3	applications	2
3.4	Total hours in the curriculum	56	3.5	of which, course	28	3.6	applications	28

Individual study	Hours
Manual, lecture material and notes, bibliography	20
Supplementary study in the library, online and in the field	4
Preparation for seminars/laboratory works, homework, reports, portfolios, essays	20
Tutoring	2
Exams and tests	2
Other activities	-

3.7	Total hours of individual study	48
3.8	Total hours per semester	104
3.9	Number of credit points	4

4. Pre-requisites (where appropriate)

4.1	Curriculum	N/A
4.2	Competence	Knowledge of electronics, system control and magnetic theory

5. Requirements (where appropriate)

5.1	For the course	Amphitheatre, Cluj-Napoca
5.2	For the applications	Laboratory, Cluj-Napoca

6. Specific competences

Professional competences	Theoretical knowledge (what the student must know):	
	Acquired skills (what the student is able to do):	After completing the discipline, the students will be able to: - know the classical topologies of dc-dc converters, methods of control, dedicated ICs; - understand the phenomenon which take place in power supplies; - choose the best configuration for a specific application; - design simple SMPS;
	Acquired abilities: (what type of equipment the student is able to handle)	After completing the discipline, the students will be able to: - use the hard and soft dedicated tools; - make all specific measurements of a power supply; - analyze the measurement results; - use the specific tools of debugging
	In accordance with Grila1 and Grila2 RNCIS	N.A.
Cross competences (Grila1 and Grila2 RNCIS)		N.A.

7. Discipline objectives (as results from the key competences gained)

7.1	General objectives	Developing the competences regarding the use, analysis and (re)design of fundamental power supplies.
7.2	Specific objectives	1. Recognizing and understanding basic concepts specific to fundamental power supplies. 2. Developing skills and abilities necessary for the use of fundamental power supplies. 3. Developing skills and abilities for the analysis and (re)design of fundamental power supplies.

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1	Introduction. General presentations. Standards	Presentation, heuristic conversation, exemplification, problem presentation, teaching exercise, case study, formative evaluation	Use of .ppt presentation, projector, blackboard
2	Linear power supplies		
3	Switch Mode Power Supplies		
4	Buck converter		
5	Buck-boost converter		
6	Boost converter		
7	Flyback converter		
8	Forward converter		
9	Push-pull converter		
10	Half bridge converter		
11	Dedicated control ICs		
12	Design of magnetic component		
13	Perturbations in SMPS		
14	Power factor correction circuits		
8.2. Applications (lab)		Teaching methods	Notes
1	Introduction. Lab instrumentation	Didactic and experimental proof, didactic exercise, team work	Use of laboratory instrumentation, experimental boards, computers, white/magnetic board
2	Buck converter		
3	Buck-boost converter		
4	Boost converter		
5	Flyback converter		
6	Forward converter		
7	Push-pull converter		
8	Half bridge converter		
9	Self-oscillating converters- flyback converter		
10	Self-oscillating converters - current control mode flyback converter		
11	Self-oscillating converters -push –pull converter		
12	Post regulators based on magnetic amplifier		
13	The IC UC 2524		
14	Laboratory test		

Bibliography

1. Dorin Petreuş - Electronica surselor de alimentare-Editura Mediamira, Cluj-Napoca, 2002
2. D. Petreuş, Ş.Lungu-Surse în comutaţie – îndrumător de laborator, Ed. Mediamira, Cluj-Napoca, 1999
3. Robert W.Erickson, Fundamentals of Power Electronics ,Kluwer Academic Publishers, 1997, ISBN 0-412-08541-0, 769 pag.
5. www.st.com, www.onsemi.com, www.feroxcube.com;

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

Competences acquired will be used in the following COR occupations (Electronics Engineer; Telecommunications Engineer; Electronics Design Engineer; System and Computer Design Engineer; Communications Design Engineer) or in the new occupations proposed to be included in COR (Sale Support Engineer; Multimedia Applications Developer; Network Engineer; Communications Systems Test Engineer; Project Manager; Traffic Engineer; Communications Systems Consultant).

10. Evaluations

Activity type	10.1	Assessment criteria	10.2	Assessment methods	10.3	Weight in the final grade
Course		The level of acquired theoretical knowledge and practical skills		- Summative evaluation written exam (theory and problems)		- T, max 10 pts. 20% - E, max 10 pts.

						60%
Applications		The level of acquired abilities		- Continuous formative evaluation - practical lab test		- L, max. 10 pts. 20%
10.4 Minimum standard of performance						
$L \geq 4$ and $E \geq 4$ and $0,6E+0,2L+0,2T \geq 4.5$						

Date of filling in
1.10.2018

Course responsible
Prof. Dorin Petreus, PhD

Teachers in charge of applications
Assistant Prof. Radu Etz, PhD,
Assistant Prof. Toma Patarau, PhD,