

**UNIVERSITY OF PETROSANI
MECHANICAL AND ELECTRICAL ENGINEERING FACULTY**

CURRICULUM PLAN

Starting with the 2018-2019 academic year

Study Program: *INDUSTRIAL POWER ENGINEERING*
Fundamental Field: *ENGINEERING*
Bachelor Field: *POWER ENGINEERING*
Academic studies: *4 YEARS*
Mode of studies: *FULL-TIME (F)*
full-time (F)/ low frequency (IFR)/ distance learning (ID)

TRAINING OBJECTIVES AND COMPETENCES

General objective of the curriculum: The graduate of the “Industrial Power Engineering” program has the appropriate knowledge of fundamental disciplines (mathematics, physics, programming and use of computers, electrotechnics, etc.), and also that related to the methodological and operative aspects of the power engineering. This knowledge helps the graduate to understand the operation of industrial power systems, evaluate and propose solutions for the impact of energy processes on economic, environmental and social level.

Specific objectives of the curriculum: The transfer of knowledge and skills training that are necessary to acquire the following competences:

Professional competences:

C1 - Use of knowledge regarding the principles of operation and the environmental impact related to systems for generation, transmission and distribution of electricity and thermal energy.

C2 - Explaining and interpreting general and specific concepts regarding technological processes from within energy usage systems.

C3 - Solving problems of sizing, operation and maintenance related to power equipment and installations.

C4 - Critical-constructive usage of basic elements related to the management of power systems, in relation with legislation in force and with the energy market principles.

C5 - Using basic knowledge for modelling, design and exploitation of power equipment and installations for creative and innovative purposes.

C6 - Application in terms of autonomy and limited responsibility of efficient power usage from the final consumer and for the energy audit development.

C7 - Ability to make decisions in the management of a technical energy process of significant extent and implications.

Transversal competences:

CT1 - Identification of objectives to be achieved, of available resources, of their closing terms, work stages, work times, deadlines and related risks.

CT2 - Identification of roles and responsibilities in a multidisciplinary team and the application of efficient networking and working techniques within the team.

CT3 - Efficient use of information and communication resources and of occupational assisted training (Internet portals, specialized software, databases, on-line, courses), both in Romanian and in an international language.

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MINISTRY OF NATIONAL EDUCATION

**CURRICULUM PLAN
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No.	FIRST YEAR	Subject Code	Type	1st Semester				2nd Semester				Credit Points		Ei, Ci		No. of teaching hours per subject			Hours of individual study	Total hours per subject	
	Subject			C	S	L	P	C	S	L	P	Sem.1	Sem.2	Sem.1	Sem.2	Course	Apl.	Total			
1	Linear Algebra, Coordinate and Differential Geometry	2II1OF01	F	2	2							4		E1		28	28	56	44	100	
2	Mathematical Analysis	2II1OF02	F	2	2							4		E1		28	28	56	44	100	
3	Mechanics	2II1OD03	D	2		1						4		C1		28	14	42	58	100	
4	Applied Software	2II1OF04	F	2		2						4		E1		28	28	56	44	100	
5	English I	2II1AX05	X		2							2		C1		0	28	28	22	50	
6	Basics of Electrical Engineering I	2II1OD06	D	2	2							5		E1		28	28	56	69	125	
7	Optional Subject OP11	2II1AX07	X	1	1							2		C1		14	14	28	22	50	
8	Chemistry	2II1OF08	F	2		1						3		C1		28	14	42	33	75	
9	Physical Education and Sports I	2II1OX09	X		2							2		A/R		0	28	28	0	28	
10	English II	2II2AX10	X						2				2		C2		0	28	28	22	50
11	Basics of Electrical Engineering II	2II2OF11	D					2		1			4		E2		28	14	42	58	100
12	Computer Aided Graphics I	2II2OF12	F					2		2			4		C2		28	28	56	44	100
13	Physics	2II2OF13	F					2		1			4		C2		28	14	42	58	100
14	Optional Subject OP12	2II2OF14	F					2	2				4		E2		28	28	56	44	100
15	Introduction in Power Engineering	2II2OD15	D					2		1			3		E2		28	14	42	33	75
16	Material technology	2II2OD16	D					2		1			3		C2		28	14	42	33	75
17	Electronics	2II2OD17	D					3		1			4		E2		42	14	56	44	100
18	Physical Education and Sports II	2II2OX18	X						2				2		A/R		0	28	28	0	28
TOTAL first year				13	11	4	0	15	6	7	0	30	30	8E + 8C		392	392	784	672	1456	
				28				28				60									

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No.	SECOND YEAR	Subject Code	Type	1st Semester				2nd Semester				Credit Points		Ei, Ci		No. of teaching hours per subject			Hours of individual study	Total hours per subject
	Subject			C	S	L	P	C	S	L	P	Sem.1	Sem.2	Sem.1	Sem.2	Course	Apl.	Total		
19	Programming Computers and Programming Languages I	2II3OF19	F	2		3						5		E3		28	42	70	55	125
20	Electrical and Non-Electrical Values Measurement I	2II3OD20	D	3		2						4		E3		42	28	70	30	100
21	Thermodynamics	2II3OD21	D	2		1						4		E3		28	14	42	58	100
22	Strength of Materials	2II3OD22	D	2		1						4		C3		28	14	42	58	100
23	Optional Subject OP21	2II3AX23	X		2							2		C3		0	28	28	22	50
24	Computer Aided Graphics II	2II3OF24	F	2		3						5		E3		28	42	70	55	125
25	Hydraulic Machines	2II3OD25	D	2	1	1						5		C3		28	28	56	69	125
26	Physical Education and Sports III	2II3OX26	X		1							1		A/R		0	14	14	0	28
27	Heat and Mass Transfer	2II4OD27	D					2		1			3		C4	28	14	42	33	75
28	Electrical and Non-Electrical Values Measurement II	2II4OD28	D					2		2			4		E4	28	28	56	44	100
29	Renewable Sources	2II4OD29	D					2		1			3		E4	28	14	42	33	75
30	Generation of Electricity and Thermal Energy I	2II4OD30	D					2		1			3		C4	28	14	42	33	75
31	Optional Subject OP22	2II4AX31	X						2				2		C4	0	28	28	22	50
32	Programming Computers and Programming Languages II	2II4OF32	F					2		2			4		E4	28	28	56	44	100
33	Thermal Equipment and Installations	2II4OD33	D					2		1	1		3		E4	28	28	56	19	75
34	Electrotechnical Materials	2II4OS34	S					2		2			3		C4	28	28	56	19	75
35	Physical Education and Sports IV	2II4OX35	X						1				1		A/R	0	14	14	0	28
36	Practical Training 3weeks.x30 hours/week	2II4OD36	D										4		C4	0	90	90	0	90
TOTAL second year				13	4	11	0	14	3	10	1	30	30	8E + 8C		378	496	874	594	1496
				28				28				60								

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No.	THIRD YEAR	Subject Code	Type	1st Semester				2nd Semester				Credit Points		Ei, Ci		No. of teaching hours per subject			Hours of individual study	Total hours per subject
	Subject			C	S	L	P	C	S	L	P	Sem.1	Sem.2	Sem.1	Sem.2	Course	Apl.	Total		
37	Electrical Equipments	2II5OD37	D	2		2						5		E5		28	28	56	69	125
38	Fluid Mechanics	2II5OD38	D	2		2						5		C5		28	28	56	69	125
39	Electrical Networks I	2II5OD39	D	2		2	2					6		E5		28	56	84	66	150
40	Electrical Machines and Drives I	2II5OD40	D	3		2	1					6		E5		42	42	84	66	150
41	Electrical Section of Power Plants and Stations I	2II5OD41	D	2		1						4		E5		28	14	42	58	100
42	Energy II	2II5OD42	D	2		1						4		C5		28	14	42	58	100
43	Electrical Machines and Drives II	2II6OD43	D					3		2			5		E6	42	28	70	55	125
44	Optional Subject OP31	2II6AS44	S					2		1	1		4		E6	28	28	56	44	100
45	Electrical Section of Power Plants and Stations II	2II6OD45	D					2		1			3		C6	28	14	42	33	75
46	Reliability	2II6OD46	D					2		1			3		C6	28	14	42	33	75
47	Electrical Networks II	2II6AD47	D					2		1			3		E6	28	14	42	33	75
48	Optional Subject OP32	2II6OS48	S					2		1			3		C6	28	14	42	33	75
49	Automatic Control Theory	2II6OD49	D					3		2			5		E6	42	28	70	55	125
50	Practical Training 3weeks.x30 hours/week	2II6OD50	D										4		C6	0	90	90	0	90
TOTAL third year				13	0	10	3	16	0	9	1	30	30	8E + 6C	406	412	818	672	1490	
				26				26				60								

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No.	FOURTH YEAR	Subject Code	Type	1st Semester				2nd Semester				Credit Points		Ei, Ci		No. of teaching hours per subject			Hours of individual study	Total hours per subject
	Subject			C	S	L	P	C	S	L	P	Sem.1	Sem.2	Sem.1	Sem.2	Course	Apl.	Total		
51	Control Numerical Systems	2II7OS51	S	2		2						5		E7		28	28	56	69	125
52	Power Electronics	2II7OS52	S	2		2						5		E7		28	28	56	69	125
53	Power Electronics - Project	2II7OS53	S				2					2		C7		0	28	28	22	50
54	Energy Process Control	2II7OS54	S	2		2						5		C7		28	28	56	69	125
55	Optional Subject OP41	2II7AD55	D	2	1							3		C7		28	14	42	33	75
56	Power Systems Optimization	2II7AS56	S	2		2						5		E7		28	28	56	69	125
57	Electric Power Systems	2II7AS57	S	2		2	1					5		E7		28	42	70	55	125
58	High Voltage Technique	2II8OS58	S					2		2			4		E8	28	28	56	44	100
59	Data Acquisition Systems in Power Engineering	2II8OS59	S					2		2			4		E8	28	28	56	44	100
60	Optional Subject OP 42	2II8AS60	S					2		2			4		C8	28	28	56	44	100
61	Electrical Equipment-Network Interaction	2II8OS61	S					2		2			4		E8	28	28	56	44	100
62	Optional Subject OP43	2II8AS62	S					2		2			4		E8	28	28	56	44	100
63	Optional Subject OP43 - Project	2II8AS63	S								2		2		C8	0	28	28	22	50
64	Elaboration of the Graduation Paper	2II8AS64	S								4		4		C8	0	56	56	0	100
65	Practical Training for the Graduation Paper	2II8AS65	S										4		C8	0	60	60	0	60
TOTAL anul IV				12	1	10	3	10	0	10	6	30	30	8E + 7C	308	480	788	628	1460	
				26				26				60								
There are 10 credit points granted for the graduation paper																				

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OPTIONAL SUBJECTS				
No.	Subject Code	Year	Subject	
7	OP 11	I	<i>Professional Communication</i>	<i>Ethics and Academic Integrity</i>
14	OP 12	I	<i>Numerical Methods</i>	<i>Special Mathematics</i>
23	OP 21	II	French I	Spanish I
31	OP 22	II	French II	Spanish II
44	OP 31	III	<i>Machine Parts</i>	<i>Finite Element Method</i>
48	OP 32	III	<i>Pumping and Ventilation Systems</i>	<i>Turbomachines</i>
55	OP 41	IV	Management	<i>Energy and Environment</i>
60	OP 42	IV	<i>Use of Electricity</i>	<i>Use of Water Energy and Complex Use of Water</i>
62	OP 43	IV	<i>Stations and Transformer Substations</i>	<i>Relay Protection</i>

FACULTATIVE SUBJECTS																
No.	Subject Code	Year	Subject	Sem. 1			Sem. 2			Credit points	Ei Ci	No. of teaching hours			Hours of ind. study	Total hours per subject
				C	S	L	C	S	L			Course	Apl.	Total		
66	2II2LX66	I	History of the Technique				1	1		3	C2	14	14	28	47	75
67	2II3LX67	II	Environment Protection	2	1					3	C3	28	14	42	33	75
68	2II4LD68	II	Use of Water Energy				2	1		3	C4	28	14	42	33	75
69	2II5LS69	III	Law and Legislation in Power Systems	2	1					3	C5	28	14	42	33	75
70	2II5LS70	III	Transport of Energy Agents	2	1					3	C5	28	14	42	33	75
71	2II6LS71	III	Use of Thermal Energy				2	1		3	C6	28	14	42	33	75
72	2II7LS72	IV	Control of Thermal Electrical Power Plants	2		1				3	C7	28	14	42	33	75
73	2II7LS73	IV	Automation	2		1				3	C7	28	14	42	33	75
74	2II8LS74	IV	Operational Research				2	1		3	C8	28	14	42	33	75
75	2II8LS74	IV	Entrepreneurship				2	1		3	C8	28	14	42	33	75
TOTAL				10	3	2	9	5	0	30		266	140	406	344	750

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