

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: ELECTRIC MACHINES		2. Course code		
3. Validity of course description: 2012/2013				
4. Level of studies: BA, BSc programme / MA,MSc programme lub <u>1st cycle</u> / <u>2nd cycle</u> of higher education				
5. Mode of studies: intramural studies / extramural studies				
6. Field of study: POWER ENGINEERING		(FACULTY SYMBOL) (RIE)		
7. Profile of studies: generally academic				
8. Programme: SUSTAINABLE ENERGY ENGINEERING (SEE).				
9. Semester: 3				
10. Faculty teaching the course: The institute of Machines and Energy Devices				
11. Course instructor: dr inż. Grzegorz Wiciak				
12. Course classification: common subjects (direction)				
13. Course status: <u>compulsory</u> /elective				
14. Language of instruction: English				
15. Pre-requisite qualifications: The electrotechnics and the electronics (the acquaintance of notions from the range of the electromagnetism).				
16. Course objectives: The delivery of the knowledge and the skill in the range of the description, measurement and analyses of the rule of electric machines				
17. Description of learning outcomes:				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	The mind of the problem from the range of the electrotechnics and the electronics, knows the rule of electric machines and rules of their selection to the installation.	Exercises and tests checking	The lecture and exercise laboratory.	K_W08, K_W11, K_W14,
2.	The mind essentials of the construction and the selection of materials with reference to electric machines	The estimation of the preparation to laboratory-(the entrance- „test”) occupations and tests checking	The lecture and exercise laboratory.	K_W10, K_W11
3.	It knows methods of the measurement of energy-magnitudes in the range of electric machines.	The estimation of the preparation to laboratory-(the entrance- „test”) works	Exercise laboratory.	K_W14, K_U09,
4.	It can conduct right measurement of electric machines and to work out and to introduce into the readable method their results	The observation of the course of laboratory-works , the estimation and „the defence” of laboratory- reports	Exercise laboratory.	K_U09, K_W03, K_W14
5.	It can dissolve right electric problems with reference to electric machines	Exercises and tests checking	The lecture and exercise laboratory.	K_U16, K_W08,
6.	The mind the need of the learnedly himself by the all life, first of all for the purpose of liftings of her own competences professional and personal. It can cooperate and work in the group, accept in her different parts.	The estimation of effects of the work in laboratory-units along with her analysis	Exercise laboratory.	K_K01, K_K03
7.				
8.				
18. Teaching modes and hours				
Lecture. (30h) / BA /MA Seminar / Class / Project / Laboratory (15h)				

19. Syllabus description:

Lecture:

Definitions, electric power, rated operational data, construction materials. Transformers: construction, principle of operation, balance of power and loss, windings connections; phase shift, parallel operation, characteristics, equivalent circuit, special transformers: autotransformer; instrument transformer. Rotating fields: methods of producing, types, properties. Induction Machines: construction, equivalent circuits of slip rings and squirrel cage machine, characteristics, and graphs, rating plate and terminal board; types of winding, start-up, speed control. Inverters and converters. Synchronous machines construction of smooth cylindrical and salient rotor machines, diagrams, characteristics, synchronization, excitation systems. DC machines: design, schemes, characteristics, brush configuration and types of commutation, rating plate and terminal board, dynamic properties, power supply, start up and speed control.

Laboratory:

1. Operational tests of electrical machines.
2. Rig exercise of transformers.
3. Rig exercise on induction motor.
4. Rig exercise of DC machine.
5. Rig exercise of synchronous generator. Synchronization.
6. Rig exercise of inverters and converters.

20. Examination: no**21. Primary sources:**

1. Plamitzer Antoni M. – Maszyny elektryczne – WN-T W-wa 1983 wyd. 8 popr.
2. Adkins B. – The General Theory of Electrical Machines – Chapman and Hall. London
3. Latek W.: Teoria maszyn elektrycznych – WNT – W-wa 1982
4. Ogulewicz Włodzimierz - Laboratoria elektryczne dla studentów Wydziału Inżynierii Środowiska i Energetyki Wyd. Pol. Śl. Gliwice 2007

22. Secondary sources:

1. Goźlińska Elżbieta – Maszyny elektryczne. Podręcznik - WSiP – W-wa 2007
2. Anuszczyk Jan – Maszyny elektryczne w energetyce – WN-T – W-wa 2005

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/15
2	Classes	/
3	Laboratory	15/30
4	Project	/
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	45/45

24. Total hours: 90**25. Number of ECTS credits: 3****26. Number of ECTS credits allocated for contact hours: 2****27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects):2****28. Comments:** Contents of the teaching can become corrected to needs of the matrix of effects of the education

Approved:

.....
(date, Instructor's signature).....
(date, the Director of the Faculty Unit signature)