SYLLABUS

1. **Course name:** Electrical Equipment
2. **Course code:** ELEQ 220944
3. **Credits:** 2 (2/0/4)

   Duration: 15 weeks (30h main course and 60h self-study)
4. **Instructors:**

   1- Dang Van Thanh, PhD

   2- Bui Van Hong, PhD

   3- Le Hoang Lam, MEng

   4- Nguyen Thi Bich Mai, MEng
5. **Course conditions**

   Prerequisites: Mathematic 3, Physics, Electrical-Electronic Material, Electric Circuit

   Corequisites: Electric Circuit
6. **Course description**

This course provides students the knowledge of the electrical equipment in the industry, including the structure, working principles, the working mode, the application of various types of industrial electrical equipment.

7. **Course Goals**

Goals	***Goal description*** *(This course provides students:)*	ELOs
G1	Master the relevant knowledge of the educational sector in the field of industrial electrical equipment	01 (H)
G2	An ability to analyze, explain and solve technical problems related to electrical equipment electrical in industrial electronic	07 (H)
G3	Teamwork skills, communication and the ability to study the issues related to module	05 (M)
G4	The ability to choose, use and application of the calculation of technical parameters, operation, maintenance, repair of electrical equipment in relation to the training sector.	02 (H)

** Note: High: H; Medium: M; Low: L*

8. **Course Learning Outcomes (CLOs)**

CLOs		***Description*** *(After completing this course, students can have:)*	Outcome
	G1.1	Presentation, Structure description, work ethic, character and effect of the electrical equipment in the transmission system, supply and use of electricity. Analyze the basic working mode of electrical equipment.	01 07

	G1.2	Understand, explain the application of electrical equipment in industry training sector.	01 07
	G2.1	Reading skills, identifying structural, electrical diagrams, technical parameters of various kinds of electrical equipment.	07 01
	G2.2	Math skills, analysis of power relations - since, according to the specifications of the corresponding working mode of electrical equipment.	07 01
	G2.3	Be able to search for documents, research and presentation of specialized content	07 01
	G3.1	The style industry, community responsibility, energy saving power	05
	G3.2	The positive attitude, initiative in learning, to complete the task of learning (attendance, homework, results presentation, exchange and cooperation groups, classes)	05
	G4.1	Calculation, choose the electrical equipment	02 07
	G4.2	Skills assessment about product quality of electrical equipment.	02 07
	G4.3	Product development direction to the electrical equipment industry	02 07

9. Study materials

- Textbooks:

[1] Dang Van Thanh, *Bai giang Thiet Bi Dien*, ĐHSPKT, 2014.

[2] Nguyen Trong Thang, Tran Phi Long, May dien – Khi cu dien, ĐHSPKT, 2005.

- References:

[3] Vu Gia Hanh- Tran Khanh Ha, May dien, NXBKHKT, Ha Noi, 2003
[4] Bui Tien Huu, Pham Van Choi, Khi cu dien, NXBKHKT, Ha Noi, 2005.
[5] Nguyen Chu Hung, Ky thuat dien, ĐHQG TPHCM, 2000.
[6] Ivanov ,May dien, NXBKHKT, Ha Noi, 2003.
[7] Hubert, Charles I, Electric machines, Prentice Hall, 2002.

10. Sudent Assessments

- Grading points: 10

- Planning for students assessment is followed:

Type	Contents	Linetime	Assessment techniques	CLOs	Rates (%)
Midterms					**50**
Exam01	DC Machine, AC motor and Circuit Breaker	Weeks 2, 6, 9 and 12	Quizes	G2.1, G2.2, G3.1, G4.1	10
Exam02	DC machine, Transformer	Week 8	Individual paper	G1.1, G1.2,	20

			assessment in class	G3.1, G4.1	
Exam03	AC machines	Week 13	Individual paper assessment in class	G1.2, G2.2, G3.2	20
Final exam					**50**
Final Exam	- The exam covers all contents related to the expected learning outcomes of the course.		Individual paper assessment in class	G1.2, G1.3, G2.1, G3.1, G3.2, G4.1, G4.2, G4.3	

11. Course details:

Weeks	Contents	CLOs
	Chapter 1: **< DC MACHINE>** *(6/0/12)*	
	A/ **Contents and teaching methods***: (2)* **Contents:** 1.1 Structure, working principle, specifications. 1.2 Power relations 1.3 Exercises **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G1.2
	B/ **Self-study contents**: *(4)* + DC machine Winding + Exercises and homeworks	G1.1 G1.2
	Chapter 1: **< DC MACHINE (cont.) >** *(6/0/12)*	
	A/ **Contents and teaching methods***: (2)* **Contents:** 1.4 DC Generator 1.5 DC Motor **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G1.2 G4.1
	B/ **Self-study contents**: *(4)* + Calculate the specifications in the working mode of the DC machine + Exercises	G1.1 G1.2 G2.1 G2.2
	Chapter 1: **< DC MACHINE (cont.) >** *(6/0/12)*	
	A/ **Contents and teaching methods***:(2)* **Contents:**	G2.1 G2.2

	1.5 DC Motor (cont.) 1.6 Exercises **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G4.1 G4.2
	***B/* Self- study contents**: *(4)* + Working modes, methods of operation, control, industrial applications of DC motors + Exercises	G4.1 G4.2
	***Chapter 2:* < TRANSFORMER >** *(4/0/8)*	
	A/* Contents and teaching methods: (2)* **Contents:** 2.1 The structure, working principle and rated value. 2.2 Equations and circuit replacement, vector graph of transformer. 2.3 The no load and short circuit experiment, parameter determines **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G2.1
	***B/* Self- study contents**: *(4)* + Equations and circuit replacement, vector graph used in the calculation MBA + Exercises	G1.1 G2.1
	***Chapter 2:* < TRANSFORMER (cont.) >** *(4/0/8)*	
	A/* Contents and teaching methods: (2)* **Contents:** 2.4 Power calculation, losses, performance of transformer 2.5 Calculate the voltage change of transformer 2.6 Transformer working in parallel **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G4.1 G4.2
	***B/* Self- study contents**: *(4)* + Calculate the load factor, Current, Voltage, and capacity of transformer while working parallel. + Exercises	G4.1
	***Chapter 3:* < ASYNCHRONOUS MACHINE >** *(4/0/8)*	
	A/* Contents and teaching methods: (2)* **Contents:** 3.1 Structure, working principle, slip, rated value of the machine 3.2 Magnetic field in asynchrounous machine 3.3 Equations and computational circuits in asynchronous machine. **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G2.1

	***B/* Self- study contents**: *(4)* + Parameters in circuit equations of asynchronous machine + Exercises	G1.1 G4.1
	***Chapter 3:* < ASYNCHRONOUS MACHINE (cont.) >** *(4/0/8)*	
	A/* Contents and teaching methods: (2)*** **Contents:** 3.4 Energy conversion, power, loss, power efficiency 3.5 Electromagnetic torque, torque-speed characteristic curve 3.6 Starting mode, speed change, braking of the machine. **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G1.2 G2.1
	***B/* Self- study contents**: *(4)* + Calculate the parameters of the starting mode, speed change and braking	G2.1
	< TEST > *(2/0/4)*	
	A/* Contents and teaching methods: (2)*** **Contents:** 1. Guided exercises 2. Tests 1 **Teaching methods**: + Questions and answers + Guide to do exercises	G1.1 G1.2 G2.1 G3.2 G4.1
	***B/* Self- study contents**: *(4)* + Reinforce the knowledge learned	G3.2 G4.1
	***Chapter 4:* < SYNCHRONOUS MACHINE >** *(4/0/8)*	
	A/* Contents and teaching methods: (2)*** **Contents:** 4.1 Structure, working principle, rated value of the machine 4.2 Electromagnetic relations in synchrounous machine **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G2.1
	***B/* Self- study contents**: *(4)* + Circuit, equations, calculate the parameters	G1.1 G1.2
	***Chapter 4:* < SYNCHRONOUS MACHINE (cont.) >** *(4/0/8)*	
	A/* Contents and teaching methods: (2)*** **Contents:** 4.3 Synchronous generator 4.4 Exercises **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G2.1 G2.2

	***B/* Self- study contents**: *(4)* + The operating characteristics of synchronous generator	G2.1 G2.2
	Chapter 5: <LOW VOLTAGE ELECTRIC INSTRUMENT > *(6/0/12)*	
	A/* Contents and teaching methods: (2)* **Contents:** 5.1 Structure, working principles, application of electric instruments. 5.2 Electromagnets, electromagnet calculation of electric instruments 5.3 Calculate the electromagnetic force in electric instruments. **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G2.1
	***B/* Self- study contents**: *(4)* + Calculate electromagnet in electric instruments.	G1.1 G2.1
	Chapter 5: <LOW VOLTAGE ELECTRIC INSTRUMENT(cont.) > *(6/0/12)*	
	A/* Contents and teaching methods: (2)* **Contents:** 5.4 The common electric instruments **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G4.1
	***B/* Self- study contents**: *(4)* + Calculate and select relays in electrical circuits and electrical devices.	G1.1 G4.1
	< TEST > *(2/0/4)*	
	A/* Contents and teaching methods: (2)* **Contents:** 3. Guided exercises 4. Tests 2 **Teaching methods**: + Questions and answers + Guide to do exercises	G1.1 G1.2 G2.1 G3.2 G4.1
	***B/* Self- study contents**: *(4)* + Reinforce the knowledge learned	G3.2 G4.1
	Chapter 5: <LOW VOLTAGE ELECTRIC INSTRUMENT(cont.) > *(6/0/12)*	
	A/* Contents and teaching methods: (2)* **Contents:** 5.5 Exercises **Teaching methods**: + Theoretical lectures using powerpoint + Questions + Discussion	G1.1 G2.1
	***B/* Self- study contents**: *(4)* + Calculate and select CB, fuse to protect electrical circuits	G1.1 G2.1
	< REVIEW> *(2/0/4)*	

	A/* Contents and teaching methods: (3)* **Contents:** 1. Review contents 2. Exercises **Teaching methods**: + Questions and answers + Instructing to do exercises	G1.2, G1.4, G2.1, G3.1, G3.2, G4.1, G4.2, G4.3
	***B/* Self- study contents**: *(6)* + Reinforce the knowledge learned + Exercises	G1.2, G1.4, G2.1, G3.1, G3.2, G4.1, G4.2, G4.3

12. Learning ethics:

- Home assignments and projects must be done by the students themselves. Plagiarism found in the assessments will get zero point

13. First approved date: August 01 2012

14. Approval level:

Dean	Department	Instructor

15. Syllabus updated process

1st time: Updated content dated	Instructors
2st time: Updated content dated	Head of department