HCMC UNIVERSITY OF TECHNOLOGY AND EDUCATION
Faculty of Electrical and Electronic Engineering
Department of Automatic Control

AUTOMATION AND CONTROL ENGINEERING TECHNOLOGY
Undergraduate Program

SYLLABUS

1. **Course name AUTOMATIC ELECTRIC DRIVE**
2. **Course code: ELDR320545**
3. **Credits:** 3 credits (3/0/6)
4. **Instructors:**
   1. PhD. Nguyen Thi Mi Sa
   2. PhD. Tran Quang Tho
   3. M.Eng. Le Thanh Lam
   4. M.Eng. Luu Van Quang

5. **Course conditions** Prerequisite: Electric machines, Electric circuit, power electronics, ..
6. **Description module (Course Description)**

This course equips students of technology electrical engineering knowledge. Read comprehension and design the automatic electric drive systems.

7. **Course Goals**

Goals	*Goal description* *(This module equips students:)*	ELOs
G1	Ability to apply the mathematical knowledge to compute some too the automatic electric drive Ability to solve problems in the field of automation (electrical systems, electric drives...)	1.1, 1.2, 2.2
G2	Have the capabilities and technical arguments to solve the problem. Can inspect and test the technical issues related Skills: creativity, flexibility, professional work,…	2.5
G3	Teamwork. Communicate effectively in writing, and presentation graphics. Ability to read, understand documents in English.	3.1, 3.3
G4	Use electric control devices to meet the requirements for automatic systems of electric drives To implement and manage projects of electric drives Operate and develop the automatic electric drive systems	4.1, 4.6

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

CLOs	*Description*	Outcome

	(After completing this course, students can have:)	
G.1	Use voltage control device: Relay, Contactor, ... implement the requirements in the field of automatic power system. save energy and electric drives. Have the ability to manage the system on.	1.1, 1.2, 2.2
G.2	Ability to search the documentation, study and propose solutions Inspection and testing of equipment and systems Ability to analysis of technology requirements and offer solutions on technical	2.5
G.3.1	Ability to work in groups to discuss and resolve issues related to	3.1, 3.3
G.3.2	Understand the relevant English terminology	3.1, 3.3
G.4.1	Understanding the transition and the requirements of the electric drive system. Explain, design and assembly of the controller systems to meet the requirements of automated, on energy savings in power systems, power plants, electric drives and renewable energy using devices controlled electric contacts.	4.1
G.4.2	Prepare, implement and manage projects of automated electric drives	4.6
G.4.3	Operation and construction processes operated electric drive system automatically	4.6

9. Study materials

- Textbooks:

1. Drive Technologies, Bui Quoc Khanh, Nguyen Van Lien, Nguyen Thi Hien, Publisher of Science - Engineering, 2013

- References:

1. Equipped with electronic and electrical, Vu Quang Hoi, Nguyen Van Chat, Nguyen Thi Lien Anh, Education Publisher, 2011
2. Transmits Action Generate electricity automatically, at Ninh Elementary, Pham Duy Nhi, Publisher Science-for Technology, 2008
3. Analysis of the total Contract SYSTEM control & automatically transmitted Action electricity, RESERVATION Ninh Title, Publisher for Technology and Science, 1996.
4. Electrical diagram, Jean Barry and Jean Yves Kersulec, Publisher HUST, 2001
5. Electric drives; Boldea, I. Nasar SA; CRC Press, 2006
6. Electric Drive, M. Chilikin, Mir Publishers, 2001
7. CD OMRON, OMRON Asia Pacific Pte Ltd, 2012
8. http: //www.omron.com.vn / e-learning / main.asp

10. Student Assessments:

- Grading points: **10**
- Planning for students assessment is followed:

Type	Contents	Linetime	Assessment techniques	CLOs	Rates (%)
Exercise					
Exercise # 1	Conditions for static stability of electric drive systems	Week 5	Exercise		0
Exercise # 2	mechanical characteristic of DC motor	Week 8	Exercises		20
Exercise # 3	mechanical characteristic of AC motors	Week 11	Exercise		20
Exercise # 4	Design electric drive systems	Week 14	Exercise		20
final test					
	requirements: All	As scheduled	Test essay		40

11. Course details:

Weeks	Contents	CLOs
1	***Chapter 1:*** **Introduction to electric drive systems**	
	***A* / the content and teaching method** **Content of theory:** 1. Concepts in General (Transmits Auto power-Transmits Action electricity) 2. Kinetic basic of electric drive systems 2.1. equation Motion **teaching method** + lecture + Presentation + Discussion	
	***B* / The content should study at home:** *(6)* + http: //www.omron.com.vn / e-learning / main.asp	
	Chapter 1: **Introduction to electric drive systems** (continued)	

2	***A* / the content and teaching method** **Content of theory:** 2.Kinetic basic of electric drive systems 2.1. equation Motion 2.2. Convert the force and kinetic moment **teaching method** + lecture + Presentation + Discussion	
	***B* / The content should study at** home: *(6)* + http: //www.omron.com.vn / e-learning / main.asp	
3	*Chapter1:* **Introduction to electric drive systems** (continued)	
	***A* / the content and teaching method** **Content of theory:** 2.Kinetic basic of electric drive systems 2.1. equation Motion 2.2. Convert the force and kinetic moment **teaching method** + lecture + Slide + Discussion	
	***B* / The content should study at** home: *(6)* +	
4	***Chapter 2:* Mechanical characteristic in electric drive system**	
	***A* / the content and teaching method** **Content of theory:** 1. The Mechanical characteristics 1.1. Definitions 1.2.classified 2. The Mechanical characteristics of load 3. The Mechanical characteristics of motor **teaching method** + Lecture + Presentation	
	***B* / The content should study at** home: *(6)* + Doing exercises in textbooks	

5	***Chapter 2:*** **Mechanical characteristic in electric drive system** (Continuedon and run out)	
	***A* / the content and teaching method** **Content of theory:** 4. the characteristics of electric drive system 5. condition of stable **teaching method** + Lecture + Presentation	
	***B* / The content should study at** home: *(6)* + Doing exercises in textbooks	
6	***Chapter* 3: Mechanical characteristic of DC motor**	
	***A* / the content and teaching method** **Content of theory:** 1. equation the characteristics of accelerated 2. the mechanical characteristics 3. How to plotting the characteristics 4. Affects The parameters to the characteristics 5. Standard for changing speed 6. changing DC motor speed 7. the mechanical characteristics in braking **teaching method** + lecture + Presentation + Discussion	
	***B* / The content should study at** home: *(6)* + Doing exercises in textbooks	
7	***Chapter* 3: Mechanical characteristic of DC motor**	
	***A* / the content and teaching method** **Content of theory:** 8. Compute the resistance in starting **teaching method**	

	+ Lecture + Presentation + Discussion	
	***B* / The content should study at** home: *(6)* + Doing exercises in textbooks	
8	***Chapter* 4: Mechanical characteristic of AC motor**	
	***A* / the content and teaching method** **Content of theory:** 1. equation the characteristics of accelerated 2. the mechanical characteristics 3. How to plotting the characteristics 4. Affects The parameters to the characteristics 5. Standard for changing speed 6. changing AC motor speed 7. the mechanical characteristics in braking 8. Compute the resistance in starting **teaching method** + lecture + Presentation + Discussion	
	***B* / The content should study at** home: *(6)* + Doing exercises in textbooks	
9	***Chapter 5:*** **CHOOSING ELECTRIC MOTOR**	
	***A* / the content and teaching method** **Content of theory:** 1. Choosing electric motor in unregulated speed system 2. Choosing electric motor in regulated speed system **teaching method** + Lecture + Presentation + Discussion Group	
	***B* / The content should study at** home: *(6)* + Doing exercises in textbooks	
	Chapter 6: **AUTOMATIC ELECTRIC DRIVE SYSTEM**	

10	***A* / the content and teaching method** **Content of theory:** 1. Apply PLC in automatic electric drive system 2. Some automatic electric drive system in real life **teaching method** + lecture + Presentation + Discussion group	
	***B* / The content should study at** home: *(6)* + Doing exercises in textbooks	

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

13. 13. First approved date:

14. 14. Approval level:

Dean	Department	Instructor
Assoc. Prof. PhD. Nguyen Minh Tam	**Assoc. Prof. PhD. Truong Viet Anh**	**PhD. Nguyen Thi Mi Sa**

15. Syllabus updated process

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