

MINISTRY OF EDUCATION & TRAINING
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY & EDUCATION

UNDERGRADUATE PROGRAM

Major of
**AUTOMATION AND CONTROL ENGINEERING
TECHNOLOGY**

MAY 2024

UNDERGRADUATE PROGRAM

Education Program: Automation and Control Engineering Technology

Level: Undergraduate

Major: Automation and Control Engineering Technology

Type of Program: Full time

(Decision No.....date....on.....)

1. Duration of Study: 4 years

2. Student Enrollment: High-school Graduates

3. Grading System, Curriculum and Graduation Requirements

Grading System: 10

Curriculum: Based on regulations of Decision No 43/2007/BGDDT

Graduation Requirements:

General condition: Based on regulations of Decision No 43/2007/BGDDT

Condition of specialty: None

4. The objectives and Expected Learning Outcomes

Goals

Training human resources, improving intellectual standards of the people, fostering talents; researching science and technology for new knowledge & product creation to meet the requirements of development of economics & society, to ensure national defense, security and international integration.

Training learners have political quality, morality, knowledge, professional practice skills, research capacity, development of scientific applications and technologies that are commensurate with the level of training. They have a healthy body, creative capability and professional responsibility, adaptability to the work environment; spirit of serving the people.

Training Engineers of Automation and Control Engineering Technology (ACET) major have basic scientific knowledge, fundamental knowledge, specialized knowledge of automation and control major, analysis capability, solve problem skills and solutions assessment, ability contribution, design, operation of automation and control systems, communication skills and work in a team, professional attitudes, meet the development requirements of major and society. After graduation, the graduates are able to work in companies, factories, industrial manufacturer or operation of automatic control systems and ACET education organizations.

Objectives

PO1: Form a stable foundation of general knowledge, foundation and core knowledge and specialized/ major knowledge of Automation and Control Engineering Technology.

PO2: Use proficiently self-studying skills major, problem solving skills and professional skills in the major of Automation and Control Engineering Technology.

PO3: Communicate effectively, organize, lead and conduct teamwork.

PO4: Apply well competences of brainstorming, designing, deploying, and operating the Automation Control System, Robotic systems, PLC System, Electric Drive, to improvement or creation of electrical and electronic products.

PO5: Be able to grasp society's needs, carry out social responsibilities, respect work ethics and be aware of life-long learning.

Program outcomes

A. General knowledge, fundamental and specialized knowledge of Automation and Control major:

ELO 1.1. Apply fundamental knowledge of mathematics, natural science and social science; achieve more specialized knowledge and study further at higher levels.

ELO 1.2. Construct the basis of core technological knowledge about Automation and Control.

ELO 1.3. Create the combination of advanced specialized knowledge in the fields Automation and Control systems.

B. Specialized and professional skills in electrical and electronics major:

ELO 2.1. Analyze and argue for technical matters; brainstorm systematically, and solve automatic control system matters.

ELO 2.2. Examine and experiment electrical and electronic matters.

ELO 2.3. Implement proficiently professional skills in the Automation and Control field.

ELO 2.4. Be aware of life-long learning.

ELO 2.5. Realize the roles and responsibility of engineers and social circumstances which have impacts on the technical activities of the electrical and electronic industry.

C. Communication skills and ability to work in multidisciplinary areas:

ELO 3.1. Work independently; lead and work in a team.

ELO 3.2. Communicate effectively in various methods: written communication, electronics communication, graphics and presentation.

ELO 3.3. Comprehend business culture, work ethics principles, and working style of industrial organizations.

D. Skills to take shape of ideas, design, deploying and operate industrial electrical system

ELO 4.1. Recognizing the importance of social environment on technical activities in the field of control and automation.

ELO 4.2. Ability to implement small and medium automatic control systems for industrial, service and public systems.

ELO 4.3. Ability to propose implementation solutions, management of control and automation systems.

ELO 4.4. Ability to apply information technology in hardware and software design for automation systems.

ELO 4.5. Participate in building, organizing, operating and managing projects on effective control and automation.

ELO 4.6. Ability to design and operate control systems, industrial communication networks in manufacturing plants.

ELO 4.7. Able to lead in technical departments related to control and automation.

ELO 4.8. Be aware of business opportunities that can apply technology and create new products.

5. Blocks of knowledge in the whole program: 150 credits (without Physical Education, Military Education). 133+17 English

6. Allocation of credits

Groups of Courses	Credits		
	Total	Compulsion	Elective
Foundation science courses	65	63	2
Political Education + General Laws	13	13	0
Social Science	2	0	2
Mathematics and Natural Sciences	27	27	0
Informatics	3	3	0
Introduction to Automation and Control Engineering Technology	3	3	0
English	17	17	0
Automation and Control Engineering Courses	85	70	15
Fundamental courses	29	23	6
Advanced courses + Projects	28	19	9
Practice and laboratory	15	15	0
Industry Internship + Enterprise Relations in Automation Control Field	4+2	4+2	0
Graduation Thesis	7	7	0

7. Program content

A – Compulsory courses

7.1. Foundation science courses: 63

No.	Course's ID	Course name	Credits	Note
I.		Political Education and General Laws	13	
1.1	LLCT130105E	Philosophy of Marxism and Leninism	3	
1.2	LLCT120205E	Political economics of Marxism and Leninism	2	
1.3	LLCT120405E	Scientific socialism	2	
1.4	LLCT220514E	History of Vietnamese communist party	2	
1.5	LLCT120314E	Ho Chi Minh's ideology	2	
1.6	GELA220405E	General Laws	2	
II.		Introduction to Automation and Control Engineering Technology	3	
2.1	IEAC130046E	Introduction to Automation and Control Engineering Technology	2+1	1 Practice
III.		Informatics	3	
3.1	CPRL130064E	C program language	3	
V.		Mathematics and Natural Sciences	27	
5.1	MATH132401E	Calculus 1	3	
5.2	MATH132501E	Calculus 2	3	

5.3	MATH132601E	Calculus 3	3	
5.4	MATH132901E	Mathematical Statistics for Engineers	3	
5.5	AMEE341944E	Applied Mathematical in Electrical Engineering	4	
5.6	PHYS130902E	Physics 1	3	
5.7	PHYS111202E	Physics - Lab 1	1	
5.8	PHYS130502E	Physics 2	3	
5.9	PHYS111302E	Physics - Laboratory 2	1	
5.10	GCHE130603E	General Chemistry for Engineers	3	
VI.		Social Science (choose 02 out of 12 courses)	2	
6.1	GEEC220105E	General Economics	2	
6.2	SYTH220491E	Creativity Methodologies	2	
6.3	PLSK320605E	Planning Skill	2	
6.4	INMA220305E	Introduction to Management	2	
6.5	INSO321005E	Introduction to Sociology	2	
6.6	IQMA220205E	Introduction to Quality Management	2	
6.7	INLO220405E	Introduction to Logics	2	
6.8	PRSK320705E	Presentation Skills	2	
6.9	SYTH220505E	Systems Thinking	2	
6.10	ULTE121105E	University Learning Methods	2	
6.11	IVNC320905E	Vietnamese Culture	2	
6.12	TDTS320805E	Writing Scientific and Technical Documents	2	
VII.		Supplementary Courses	17	
7.1	EHQT130137E	Academic English 1	3	
7.2	EHQT230237E	Academic English 2	3	
7.3	EHQT330337E	Academic English 3	3	
7.4	EHQT430437E	Academic English 4	3	
7.5	TEEN120146E	Technical English 1	2	
7.6	TEEN230246E	Technical English 2	3	
VIII.		Physical Education	5	
	PHED110513E	1. Physical Education 1	1	
	PHED110613E	2. Physical Education 2	1	
	PHED130715E	3. Physical Education 3 (compulsory)	3	
IX.		National Defense Education	165 periods	

7.2. Automation and Control Engineering Courses

7.2.1. Fundamental ACET courses: 29

No.	Course's ID	Course name	Credits	Note
EEE related courses			29	
1.	ELCI140144E	Electric Circuit	4	
2.	BAEL340662E	Basic Electronics	4	
3.	DIGI330163E	Digital Systems	3	
4.	POEL330262E	Power Electronics	3	
5.	ACSY330346E	Automatic Control Systems	3	
6.	ELMA230344E	Electrical Machines	3	
7.	MICR330363E	Microprocessor	3	
8.		<i>Elective Fundamental course 1</i>	3	
9.		<i>Elective Fundamental course 2</i>	3	
Elective Fundamental course 1, 2 (Students choose 2 out of the below mentioned courses)				
1.	EMIN330244E	Electrical Measurement and Instruments	3	
2.	ELIN330444E	Electricity instruments	3	
3.	PLCS330846E	Programmable Logic Controller	3	Bỏ
4.	ELFI230344E	Electromagnetic Field	3	
5.	EEMA330544E	Electronic and Electrical Materials	3	
6.	ELPS330345E	Electrical Power Supply	3	
7.	SISY330164E	Signals and Systems	3	
8.	EMSE232244E	Instrumentation and Sensors	3	
9.	MALE370293E	Machine Learning	3	Bỏ sung
10.	ARIN37629E	Artificial Intelligent	3	Bỏ sung

7.2.2.a Advanced ACET courses: 28 credits

No.	Course's ID	Course name	Credits	Note
I		Compulsory	16	
1.	PLCS330846E	Programmable Logic Controller	3	
2.	ROBO 330246E	Robotics	3	
3.	IASC323346E	Identification and System Control	2	
4.	INCO 321546E	Intelligent Control	2	
5.	SCDA430946E	SCADA Systems	3	
6.	EEPN 333746E	Electrical Equipment and Pneumatic	3	
II	Elective		9	
		<i>Elective Advanced course 1</i>	3	
		<i>Elective Advanced course 2</i>	3	
		<i>Elective Advanced course 3</i>	3	
1.	ELDR330545E	Automatic Electric Drive	3	
2.	CADA430546E	CAD for Automation and Control Engineering	3	
3.	IMPR 432446E	Image Processing in Industrial	3	
4.	EMSY437764E	Embedded Systems	3	
5.	MASC330146E	Modelling and Simulation using Computer	3	
6.	PRCO431846E	Process Control	3	
7.	FMCI431746E	FMS and CIM	3	
8.	ELPS330345E	Power Supply System	3	

9.	RENE346745E	Renewable Energy	4	
10.	ELDR330545E	Automatic Electric Drive	3	
11.	CADA430546E	CAD for Automation and Control Engineering	3	
12.	IMPR 432446E	Image Processing in Industrial	3	
Projects				
13.	ARPR310746E	Project on Automatic Control	1	
14.	PPLC311146E	Project on Programmable Logic Controller	1	
15.	RBPR310846E	Project on Robotics	1	
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				

7.2.2.b. Advanced ACET courses: 21 (courses in workshop, industrial internship, Extracurricular activities + seminars specialized)

No.	Course's ID	Course name	Credits	Note
		Practice and experiment	15	
1.	ELPR210644E	Electricity in Practice	1	
2.	PREM310744E	Electric Machine in Practice	1	
3.	ELPR320762E	Electronics in Practice	2	
4.	PRDI310263E	Digital Systems in Practice	1	
5.	PREM211244E	Electric Machine in Practice	1	
6.	POEP320262E	Power Electronics in Practice	2	
7.	PACS 320246E	Automatic Control System in Practice	2	
8.	PRMI 320463E	Microprocessor in Practice	2	
9.	PPLC321346E	Programmable Logic Controller in Practice	2	
10.	ROPR311246E	Robotics in Practice	1	
		Internship	4+2	
11.	ININ442346E	Industry Internship	4	
12.	ERAC423446E	Enterprise Relations in Automation Control Field	2	

7.2.3. Graduation Thesis (or graduation examination): 7

No.	Course's ID	Course name	Credits	Note
1	FIPR472546E	Graduation Thesis	7	

8. Curriculum Distribution (*Expectation, and only main semesters: 1, 2, ..., 8*)

1st Semester

No.	Course ID	Course Title	Credits	Prerequisite
1	LLCT130105E	Philosophy of Marxism and Leninism	3	
2	IEAC130046E	Introduction to Automation and Control Engineering Technology	2+1	
3	MATH132401E	Calculus 1	3	
4	PHYS130902E	Principles of Physics 1	3	
5	GCHE130603E	General Chemistry	3	
6	PHED110513E	Physical Education 1	0(1)	
7	EHQT130137E	Academic English 1	3	
8	EHQT230237E	Academic English 2	3	
Total			21	

2nd Semester

No.	Course id	Course Title	Credits	Prerequisite
1	LLCT120405E	Scientific socialism	2	
2	LLCT120205E	Political economics of Marxism and Leninism	2	
3	MATH132501E	Calculus 2	3	
4	ELCI140144E	Electrical Circuits	4	
5	PHYS111202E	Physics - Laboratory 1	1	
6	PHYS130502E	Physics 2	3	
8	EHQT330337E	Academic English 3	3	
9	TEEN120146E	Technical English 1	2	
10	PHED110613E	Physical Education 2	0(1)	
Elective Social Science				
	INMA220305E	Introduction to Management	2	
	TDTS320805E	Writing Scientific and Technical Documents	2	
Total			22	

3rd Semester (June 3, 2022) ACET

No.	Course id	Course Title	Credits	Prerequisite
1	MATH132601E	Calculus 3	3	
2	AMEE341944E	Applied Mathematical in Electrical Engineering	4	
3	BAEL340662E	Basic Electronics	4	
4	PHYS111302E	Physics - Laboratory 2	1	
5	ELPR210644E	Electricity in Practice	1	
6	CPRL130064E	C programming language	3	
7	EHQT430437E	Academic English 4	3	
8	TEEN230246E	Technical English 2	3	
9	PHED130715E	Physical Education 3	0(3)	
10	PHED110613E	Physical Education 2	0(1)	
Total			22	

4th Semester

No.	Course id	Course Title	Credits	Prerequisite
10.	MATH132901E	Mathematical Statistics for Engineers	3	
11.	DIGI330163E	Digital Systems	3	
12.	POEL330262E	Power Electronics	3	
13.	ACSY330346E	Automatic Control Systems	3	
14.	ELMA230344E	Electrical Machines	3	
15.	ELPR320762E	Electronics in Practice	2	
Elective Fundamental course			2	
16.	EMSE232244E	Elective Fundamental course 1	3	
17.	SISY330164E	Elective Fundamental course 2	3	
18.	LLCT120314E	Ho Chi Minh's ideology	2	
Total			25	

5th Semester

No.	Course id	Course Title	Credits	Prerequisite
	MICR330363E	Microprocessor	3	
	PLCS330846E	Programmable Logic Controller	3	
	PRDI310263E	Digital Systems in Practice	1	
	PREM211244E	Electric Machine in Practice	1	
	POEP320262E	Power Electronics in Practice	2	
	PACS 320246E	Automatic Control System in Practice	2	
	ARPR310746E	Project on Automatic Control	1	
	GELA220405E	General Laws	2	
	LLCT220514E	History of Vietnamese communist party	2	
0		Elective Advanced course 1	3	
Total			20	

6th Semester

No.	Course id	Course Title	Credits	Prerequisite
1	ROBO 330246E	Robotics	3	
2	IASC323346E	Identification and System Control	2	
3	INCO 321546E	Intelligent Control	2	
4	PPLC311146E	Project on Programmable Logic Controller	1	
5	PRMI 320463E	Microprocessor in Practice	2	
6	EEPN 333746E	Electrical Equipment and Pneumatic	3	
7	PPLC321346E	Programmable Logic Controller in Practice	2	
8		Elective Advanced course 2	3	
Total			18	

7th Semester

No.	Course id	Course Title	Credits	Prerequisite
1	SCDA430946E	SCADA Systems	3	
2	RBPR310846E	Project on Robotics	1	
3	ROPR311246E	Robotics in Practice	1	
4	PMEM310846E	Electrical Equipment and Pneumatic in Practice	1	
5		Elective Advanced course 3	3	
6	ININ442346E	Industry Internship	4	
7	ERAC423446E	Enterprise Relations in Automation Control Field	2	
Total			15	

8th Semester

No.	Course id	Course Title	Credits	Prerequisite
1	FIPR472546E	Graduation Thesis	7	
Total			7	

Note: Extracurricular activities + seminars specialized 2 credits:

Encourage students to start participating from the first semester of the program but will be required in semesters 5,6,7 to get better quality.

9. Campus Infrastructure

Follow the Ministry of education and training's regulations.

9.1 Workshops and Laboratories:

- Electricity in Practice Laboratory
- Electronics in Practice Laboratory
- Power Electronics in Practice Laboratory
- Electrical machine in Practice Laboratory
- Electrical Drive in Practice Laboratory
- Programmable Logic Controller in Practice Laboratory
- Power Supply System in Practice Laboratory

9.2 Library, Website

- University's Library
- Faculty's Library
- Faculty's Website

10. PROGRAM GUIDE

- Credit hour is calculated as:

$$\begin{aligned} 1 \text{ credit} &= 15 \text{ lecture hours} \\ &= 30 \text{ laboratory hours} \end{aligned}$$

- = 45 hours practice
- = 45 hours self -study
- = 90 workshop hours.
- = 45 hours for project, thesis.

- Graduation thesis: conduct a research project to solve specific problems related to the major.

RECTOR

DEAN OF FACULTY