

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

**UNDERGRADUATE PROGRAM**

*Major of*  
**MECHATRONIC ENGINEERING TECHNOLOGY**

November 2019

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## UNDERGRADUATE PROGRAM

**Education Program:** MECHATRONIC ENGINEERING TECHNOLOGY

**Level:** Undergraduate

**Major:** MECHATRONIC 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/BGDĐT

**Graduation Requirements:**

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

*Condition of speciality:* 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,toensure national defense, security and international integration.

Training learner havepolitical 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 **Mechatronic Engineering Technology**major have basic scientific knowledge, fundamental knowledge, specialised knowledge of ,mechanical, electricaland electronics major, analysis capability, solve problem skills andsolutions assessment, ability contribution, design, operation of mechanical systems, communication skillsandwork 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 manufactories.

### Objectives

PO1: Form a stable foundation of general knowledge, foundation and core knowledge and specialised/ major knowledge of **Mechatronic Engineering Technology**.

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

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

PO4: Apply well competences of brainstorming, designing, deploying, and operating the **Mechatronic systems**

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 specialised knowledge of electrical and electronics major:**

ELO 1. Apply fundamental knowledge of mathematics, natural science and social science; achieve more specialized knowledge and study further at higher levels.

ELO 2. Construct the basis of core technological knowledge about **Mechatronic Engineering Technology**.

ELO 3. Create the combination of advanced specialized knowledge in the fields of **Mechatronic Engineering Technology**.

#### **B. Specialised and professional skills in electrical and electronics major:**

ELO 4. Analyze and argue for technical matters; brainstorm systematically, and solve mechanical matters.

ELO 5. Examine and experiment mechanical matters.

ELO 6. Implement proficiently professional skills in the mechanical field.

#### **C. Communication skills and ability to work in multidiscipline areas:**

ELO 7. Work independently; lead and work in a team.

ELO 8. Communicate effectively in various methods: written communication, mechanical drawing communication, graphics and presentation.

ELO 9. Use English in communication.

ELO 10. Realize the roles and responsibility of engineers and social circumstance which has impacts on the technical activities of industry.

ELO 11. Comprehend business culture, work ethics principles, and working style of industrial organizations.

ELO 12. Be aware of life-long learning.

#### **D. Skills to take shape of ideas, design, deploying and operate system of Mechatronic Engineering Technology**

ELO 13. Take shapes of ideas, set up requirements, determine functions and elements of the Mechanical System, Electrical and Electronic System, Programming for Industrial Systems, Renewable Energy, Mechatronic, and Automatic Control System.

ELO 14. Design required elements of the Mechanical System, Electrical and Electronic System, Programming for Industrial Systems, Renewable Energy, Mechatronic, and Automatic Control System.

**5. Blocks of knowledge in the whole program: 130credits** (without Physical Education, Military Education, and Supplementary Courses)

## 6. Allocation of credits

Groups of Courses	Credits		
	Total	Compulsory	Optional
<b>Foundation science courses</b>	<b>56</b>	<b>52</b>	<b>4</b>
General Politics + Laws	12	12	
Social Sciences and Humanities	4		4
Mathematics and Natural Sciences	25	25	
Technical Computer Sciences	6	6	
Introduction to Engineering Technology	3	3	
Academic English	<b>6</b>	6	
<b>Mechatronics Engineering Courses</b>	<b>85</b>	<b>76</b>	<b>9</b>
Fundamental Mechatronics Engineering courses	28	28	
Advanced Mechatronics Engineering courses	32	23	9
Experiments and Practices	11	11	
Technical English	5	5	
Internship	2	2	
Graduation Thesis	<b>7</b>	<b>7</b>	
<b>Total Credit</b>	<b>141</b>		

## 7. CONTENTS OF THE PROGRAM

### A. COMPULSORY COURSES

#### 7.1 Foundation science courses (44 credits)

Number	Course's ID	Course Name	Credits	Notes
1	LLCT130105E	Philosophy of Marxism and Leninism	3	
2	LLCT120205E	Political economics of Marxism and Leninism	2	
3	LLCT120405E	Scientific socialism	2	
4	LLCT120314E	Ho Chi Minh's ideology	2	
5	LLCT220514E	History of Vietnamese communist party	2	
6	INME130129E	Introduction to Mechatronic Engineering	3	
7	GELA220405E	General Laws	2	
8	MATH132401E	Calculus I	3	
9	MATH132501E	Calculus II	3	
10	MATH132601E	Calculus III	3	
11	MATH132901E	Mathematical Statistics for Engineers	3	
12	AMME331529E	Applied Mathematics in Mechanical Engineering	3	
13	PHYS 130402E	Principles of Physics 1	3	
14	PHYS111202E	Principles of Physics - Laboratory 1	1	
15	PHYS131002E	Principles of Physics 2	3	
16	GCHE130603E	General Chemistry for Engineers	3	
17	APEN331329E	Applied Programming in Engineering	3(2+1)	

18	MEIF134529E	Information Technology for Engineers	3(2+1)	
19	PHED110513E	Physical Education 1	0	
20	PHED110613E	Physical Education 2	0	
21	PHED130715E	Physical Education 3	0	
22	GDQP008031E	Military Education	0	
23		General Knowledge Option Course 1	2	
24		General Knowledge Option Course 2	2	
Total (excluding Physical Education and Military courses)			<b>50</b>	

## 7.2 Mechatronics Engineering Courses (76 Credits)

### 7.2.1 Fundamental Mechatronics Engineering courses

Number	Course's ID	Course Name	Credits	Notes
1	ENDR130123E	Engineering Drawing (2+1)	3	
2	ENME130620E	(Engineering Mechanics)	3	
3	SMME230720E	Strength of Materials	3	
4	MEMD230323E	Machine Design	3	
5	PRMD310523E	Projects of machine design	1	
6	TOMT220225E	Tolerances And Measuring Technology	2	
7	ENMA225959E	Sensors and Actuators	2	
8	AUCO230329E	Automatic Control	3	
9	EEEN230129E	Electrical and Electronics Engineering	3	
10	MATE230430	Manufacturing Technology	3	
11	DITE226829E	Digital Techniques	2	
Total			<b>28</b>	

### 7.2.2.a Advanced Mechatronics Engineering courses (Theory and Experiment Courses)

Number	Course's ID	Course Name	Credits	Notes
1	PNHY230529E	Pneumatic & Hydraulic Technology	3	
2	MPAU220729E	Manufacturing Process Automation	2	
3	MICO236929E	Microprocessors	3	
4	SEMI325929E	Business Seminar	2	
5	SERV324029E	Drive servo systems	2	
6	ROBO331129E	Robotics	3	
7	PRME315129E	Project of Mechatronic System	1	
8		Advanced Mechatronics Engineering courses 1	3	
9		Advanced Mechatronics Engineering courses 2	3	
10		Advanced Mechatronics Engineering courses 3	3	
11	MALE337029E	Machine Learning	3	

12	ARIN337629E	Artificial Intelligent	3(2+1)	
Total			<b>32</b>	

### 7.2.2.b Advanced Mechatronics Engineering courses (*Practice and Internship Courses*)

Number	Course's ID	Course Name	Credits	Notes
1	MEPR220227E	Mechanical Experiments	2	
2	PEEE210229E	Practice of Electronic Circuit Design	1	
3	PMPA326629E	Practice of Manufacturing Process Automation	2	
4	PACT310429E	Practice of Automatic Control	1	
5	PDTM321029E	Practice of Microprocessors	2	
6	PINR411229E PAPE211429E	Practice of Industrial Robots and Sensors	1	
7	PESD324129E	Practice of Drive Servo systems	2	
8	FAIN432029E	Industry Internship	2	
Total			<b>13</b>	

### 7.2.3 Graduation thesis (7 Credits)

Number	Course's ID	Course Name	Credits	Notes
1	UGRA475529E	Graduation Thesis (Mechatronics Engineering)	<b>7</b>	

## B. OPTIONAL COURSES

### Foundation science courses (4 Credits)

Number	Course's ID	Course Name	Credits	Notes
1	GEEC220105E	General Economics	2	
2	INMA220305E	Introduction to Management	2	
3	INLO220405E	Introduction to Logics	2	
4	ULTE121105E	Learning Methods in University	2	
5	SYTH220505E	Systematic Thinking	2	
6	PLSK320605E	Planning Skill	2	
7	IVNC320905E	Introduction to Vietnamese Culture	2	
8	INSO321005E	Introduction to Sociology	2	
9	BPLA121808E	Business Plan	2	
10	SYTH220491E	System Thinking	2	
11	WOPS120390E	Planning Skill in Technologist	2	
12	REME320690E	Research Methods	2	

Notes: Student selects 2 courses with 4 credits

### Advanced Mechatronics Engineering courses (9 Credits)

Number	Course's ID	Course Name	Credits	Notes
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1	MAVI332529E	Machine Vision	3(2+1)	
2	SCDA331629E	Industrial Communication Networks	3(2+1)	
3	DIPR337529E	Digital Signal Processing	3(2+1)	
4	PCTR431929E	Process control	3(2+1)	
5	BDES333877E	BigData Essentials	3(2+1)	
6	IOTM337629E	Internet of Things in Mechatronics	3(2+1)	
7	EMSY337329E	Embedded system	3(2+1)	
8	CAED321024E	CAE in Mechanics	3(2+1)	
9	CCCT331725E	Công nghệ CAD/CAM-CNC	3(2+1)	
10	WEPR330479E	WEB Programing	3(2+1)	

Notes: Faculty selects 3 expertise courses with 3 credits 3x(2+1)

### C. SUPPLEMENTARY COURSES

Number	Course's ID	Course Name	Credits	Notes
1		Academic English 1	3	
2		Academic English 2	3	
3		Academic English 3	3	( Không tính tc )
4		Academic English 4	3	( Không tính tc )
5		Technical English 1	2	
6		Technical English 2	3	
			<b>11</b>	

### 8. Plan of Courses

#### Term 1:

Number	Course's ID	Course Name	Credits	Prerequisite
1	LLCT130105E	Philosophy of Marxism and Leninism	3	
2	LLCT120205E	Political economics of Marxism and Leninism	2	
3	MATH132401E	Calculus I	3	
4	INME130129E	Introduction to Mechatronic Engineering	3	
5	GCHE130603E	General Chemistry for Engineers	3	
6	PHED110513E	Physical Education 1	0	
7	GDQP008031E	Military Education	0	
8	EHQT130137	Academic English 1	3	
9	EHQT230237	Academic English 2	3	
10	PHYS 130402E	Principles of Physics 1	3	
Total (excluding Physical Education and Military courses)			<b>23</b>	

**Term 2:**

Number	Course's ID	Course Name	Credits	Prerequisite
1	LLCT120314E	Ho Chi Minh's ideology	2	
2	LLCT120405E	Scientific socialism	2	
3	MATH132501E	Calculus II	3	
4	MEIF134529E	Information Technology for Mechatronics	3	
5	PHED110613E	Physical Education 2	0	
6	ENDR130123E	Engineering Drawing (2+1)	3	
7	PHYS131002E	Principles of Physics 2	3	
8	ENME130620E	Engineering Mechanics	3	
9	MATH132901E	Mathematical Statistics for Engineers	3	
10	TOMT220225E	Tolerances And Measuring Technology	2	
11	PHYS111202E	Principles of Physics - Laboratory 1	1	
<b>Total (excluding Physical Education and Military courses)</b>			<b>25</b>	

**Term 3:**

Number	Course's ID	Course Name	Credits	Prerequisite
1	LLCT220514E	History of Vietnamese communist party	2	
2	MATH132601E	Calculus III	3	
3	PHED130715E	Physical Education 3	0	
4	APEN221329E	Applied Programming in Engineering	3(2+1)	
5	EEEN230129E	Electrical and Electronics Engineering	3	
6	SMME230720E	Strength of Materials	3	
7		Technical English 1	2	
8	AMME131529E	Applied Mathematics in Mechanical Engineering	3	
<b>Total (excluding Physical Education and Military courses)</b>			<b>19</b>	

**Term 4:**

Number	Course's ID	Course Name	Credits	Prerequisite
1	AUCO230329E	Automatic control	3	
2	MEMD230323E	Mechanical Design	3	
3	DITE226829E	Digital Techniques	2	
4		Academic English 3	(3)	Không tính
5	GELA220405E	General Laws	2	
6	PNHY230529E	Pneumatic & Hydraulic Technology	3	
7	PEEE210229E	Practice of Electronic Circuit Design	1	
8	MATE230430E	Manufacturing Technology	3	
9	ENMA225959E	Sensors and Actuators	2	
10	MEPR220227E	Mechanical Experiments	2	
11				



<b>Total</b>	<b>21</b>	
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**Term 5:**

Number	Course's ID	Course Name	Credits	Prerequisite
1	PRMD310523E	Projects of machine design	1	
2	SERV324029E	Drive servo systems	2	
3		General Knowledge Option Course 1	2	
4		General Knowledge Option Course 2	2	
5	ROBO331129E	Robotics	3	
6	MPAU220729E	Manufacturing Process Automation	2	
7	MICO236929E	Microprocessors	3	
8	PACT310429E	Practice of Automatic Control	1	
9		Academic English 4	(3)	Không tính
10		Technical English 2	3	
<b>Total</b>			<b>19</b>	

**Term 6:**

Number	Course's ID	Course Name	Credits	Prerequisite
1	PAPE211429E	Practice of Industrial Robots and Sensors	1	
2	PMPA326629E	Practice of Manufacturing Process Automation	2	
3	PDTM321029E	Practice of Microprocessors	2	
4		Advanced Mechatronics Engineering course 1	3	
5	ARIN337629E	Artificial Intelligent	3(2+1)	
6	MALE337029E	Machine Learning	3	
<b>Total</b>			<b>14</b>	

**Term 7:**

Number	Course's ID	Course Name	Credits	Prerequisite
1		Advanced Mechatronics Engineering course 2	3	
2		Advanced Mechatronics Engineering course 3	3	
3	FAIN432029E	Industry Internship	2	
4	PESD324129E	Practice of Drive Servo systems	2	
5	PRME315129E	Project of Mechatronic System	1	
6	SEMI325929E	Business seminar (Mechatronics)	2	
<b>Total</b>			<b>13</b>	

**Term 8:**

<b>Number</b>	<b>Course's ID</b>	<b>Course Name</b>	<b>Credits</b>	<b>Prerequisite</b>
2	UGRA475529E	Graduation Thesis (Mechatronics Engineering)	7	
<b>Total</b>			<b>7</b>	

## **10. Campus Infrastructure**

Follow the Ministry of education and training's regulations

### **10.1 Workshops and Laboratories:**

- Mechanical Measurement Technology Laboratory
- Mechanical Engineering Workshop
- Gas Welding Workshop
- Electroslag Welding Workshop
- Computer cluster
- Simulation and Automation Laboratory
- PLC Laboratory
- Pneumatic - Hydraulic Laboratory
- Robotics Laboratory
- Process Control Laboratory

### **10.2 Library, Website**

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

## **11. PROGRAM GUIDE**

- Credit hour is calculated as:

1 credit	= 15 lecture hours
	= 30 laboratory hours
	= 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**