CAN THO UNIVERSITY COLLEGE OF ENGINEERING TECHNOLOGY DEPARTMENT OF AUTOMATION TECHNOLOGY



PROGRAM SPECIFICATION AND CURRICULUM OF MECHATRONICS ENGINEERING

Can Tho 2019

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I. PROGRAM SPECIFICATIONS

According to the decision No. 3019/QĐ-ĐHCT dated July 31, 2020 of the Rector of Can Tho University for issuing the undergraduate training program, the Mechatronics Engineering program is described as follows.

Program name (Vietnamese)	Kỹ thuật Cơ điện tử
Program name (English)	Mechatronics Engineering
Program ID	7520114
University	Can Tho University
Awarded title	Engineer
Training level	Undergraduate
Number of credits	150 credits
Mode of study	Full-time
Training duration	4,5 years
Potential applicants	High school graduates or equivalent
Grading system	4

I.1. General information

I.2. Educational Philosophy

According to the Decision No. 58/CN dated March 22, 2018 of the Dean of College of Engineering Technology (CoET), Educational Philosiphy of CoET is described as follows.

"Active learning and innovation for a better future"

The Educational Philosophy of CoET is issured for all lecturers, staffs, students, and graduate students in CoET. It aims to orient the teaching and learning activities, scientific research and technology transfer, performing social responsibility and serving community; impower the levels, skills and improve the life-long learning ability of learners.

I.3. Graduation requirements

Students must meet the following conditions in order to graduate:

- Having accumulated sufficient number of compulsory courses and the required total number of credits as specified in the program;
- The cumulative grade point average (GPA) is at least 2,0 or higher (4,0-point grading scale);
- Having fulfilled all non-cumulative compulsory courses. Especially, GPA of National defense and security education courses should be at least 5,0 in the equivalent 10,0-point grading scale.
- Not be prosecuted for criminal liability; not disciplined at the level of suspension in the last school year.

I.4. Career and job opportunities

- Lifelong learning ability to acquire knowledge as needed.
- Ability to pursue higher education (master's and doctoral programs) in domestic or abroad institutions.
- Research, design, and technical consulting engineer in the field of mechatronics at government-owned corporations and venture business; engineering manager, technical operations and exploitation in the field of mechatronics at the government-owned corporations and venture business; Owning, managing the business in the field of mechatronics; researcher, lecturer in the field of mechatronics at institutes, research centers, colleges, and vocational schools.

I.5. References for designing the educational program

- Hanoi University of Science and Technology
- University of New South Wales, Australia
- Eastern Mediterranean University, Turkey
- Mission and Vision of Can Tho University and College of Engineering Technology.
- Vietnamese qualifications framework, Decision No. 1982/QĐ-TTg of Vietnamese Prime Minister, issured on November18, 2016.
- ABET Self-Study Questionnaire: Template for a Self-Study Report, Engineering Accreditation Commission, 2019-2020 Review Cycle.
- AUN-QA assessment standard.

I.6. Information about program assessment

- Mechatronics Engineering program Hanoi University of Science and Technology
- Mechatronics Engineering program Ho Chi Minh City University of Technology
- Accreditation Board for Engineering and Technology, ABET Self-Study Questionnaire: Template for a Self-Study Report, Engineering Accreditation Commission, 2013.

I.7. Program Objectives (POs)

I.7.1. General objectives

The program educational objectives of the program is to prepare mechatronics students with disciplinary knowledges and skills so that after graduation they work effectively as mechatronics engineers in companies in the industry, economics, service, or training sectors; governmental and nongovernmental organizations; and have the ability for further self-learning or pursuing higher education in mechatronics fields.

I.7.2. Specific objectives

The program is to prepare mechatronics engineers with abilities as follows.

- 1. To demonstrate politics and moral values for the service of the peoples; to be physically healthy for the development and defense of the country.
- 2. To apply interdisciplinary knowledge about basic science, mathematics, mechanics, electrics and electronics, automatic control to solve mechanics problems.
- 3. To integrate modern systems and utilize modern tools to design, evaluate, develop, and manufacture a mechatronics product.
- 4. To work effectively in a mechatronics-specific or multidisciplinary team; to review

mechatronics-specific documents; to communicate effectively; to demonstrate the attitude and ability of lifelong learning.

I.8. Program learning outcomes (PLOs)

After fulfilling the requirements of the Mechatronics Engineering program, students will gain the knowledge, skills, and attitudes as follows.

- 1. An ability to present general perspectives about social and political science, law science, cultural science and humanities; and about physical training and national defense education;
- 2. An ability to apply principles of mathematics, basic science, information technologies to solve engineering problems (ABET 1);
- 3. An ability to master and apply English or French skills at level 3/6 of the foreignlanguage capacity referencing to Vietnam's framework of foreign language (equivalent to English level B1 in the Common European Framework of Reference (CEFR)).
- 4. An ability to apply principles of mechanics, electrics-electronics, automatic control to solve mechatronics problems (ABET 1).
- 5. An ability to design, analyze, evaluate the performance of a mechatronics system or a part of a mechatronics system to meet specified needs with consideration of various factors such as public health, safety, environmental, social, and economic factors (ABET 2).
- 6. An ability to make judgments of the impacts of mechatronics solutions in global, economic, environmental, and societal contexts (ABET 4).
- 7. An ability to identify, formulate, and solve mechatronics problems by applying principles of engineering, science, mathematics, modern tools and technologies (ABET 1).
- 8. An ability to design and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw proper conclusions (ABET 6).
- 9. An ability to function effectively on a mechatronics or multidisciplinary team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives (ABET 5).
- 10. An ability to communicate effectively with a range of audiences (ABET 3).
- 11. An ability to recognize ethical and professional responsibilities with the proposed engineering solutions (ABET 4).
- 12. An ability to develop self-learning habits and acquire new knowledge as needed (ABET 7).

I.9. Admission criteria

Pursuant to the Admission Regulation of the Ministry of Education and Training and the annual enrollment scheme of Can Tho University.

I.10. Mapping the POs, PLOs, and courses

I.10.1. Mapping the POs and PLOs

DOa		PLOs										
POS	1	2	3	4	5	6	7	8	9	10	11	12
1	Х										Х	X
2		Х		Х	Х	Х	Х	Х			Х	
3					Х	Х		Х	Х			
4			Х						Х	X		Х

I.10.2. Mapping program courses and PLOs

		Course						PLOs (3)						
No.	Course ID	Course title	1	2	3	4	5	6	7	8	9	10	11	12
Fund	amental	knowledge						•						
1	QP010	National defense and security education 1 (*)	L^{I}									L		L
2	QP011	National defense and security education 2 (*)	L									L		L
3	QP012	National defense and security education 3 (*)	L									L		L
4	QP013	National defense and security education 4 (*)	L									L		L
5	TC100	Physical education 1+2+3 (*)	Μ									L		L
6	XH023	General English 1 (*)	L		L		L	L			L	L		L
7	XH024	General English 2 (*)	L		Μ		L	L			L	L		L
8	XH025	General English 3 (*)	L		Н		L	L			L	L		L
9	XH031	Level B1 English 1 (*)	L		Н		L	L			L	L		L
10	XH032	Level B1 English 2 (*)	L		Η		L	L			L	L		L
11	XH033	Level B1 English 3 (*)	L		Η		L	L			L	L		L
12	FL001	General French 1 (*)	L		L		L	L			L	L		L
13	FL002	General French 2 (*)	L		L		L	L			L	L		L
14	FL003	General French 3 (*)	L		М		L	L			L	L		L
15	FL007	Intensive French 1 (*)	L		М		L	L			L	L		L
16	FL008	Intensive French 2 (*)	L		М		L	L			L	L		L
17	FL009	Intensive French 3 (*)	L		М		L	L			L	L		L
18	TN033	Basic Informatics (*)		L	L				L	L	L			L
19	TN034	Basic Informatics in Labs (*)		L	L				L	L	L			L
20	ML014	Marxist – Leninist Philosophy	L								L	L	L	L
21	ML016	Marxist – Leninist Political Economy	М								L	L	L	L
22	ML018	Scientific Socialism	М								L	L	L	L
23	ML019	History of the Communist Party of Viet Nam	М								L	L	L	L
24	ML021	Ho Chi Minh's thought	Μ								L	L	L	L
25	KL001	General law	L								L	L	L	L
26	ML007	Basic logic	L								L	L	L	L
27	XH028	Overview of Sociology	L		L						L	L	L	L
28	XH011	Basic Vietnamese Culture	L								L	L	L	L
29	XH012	Vietnamese in Use	L								L	L	L	L
30	XH014	General management documents and archives	L								L	L	L	L
31	KN001	Transferable skills	L		L						L	L	L	L
32	KN002	Entrepreneurship and Innovation	L		L						L	L	L	L
33	TN099	Calculus		L	L				L			L	L	L

¹ Using Bloom's Taxonomy: H = Creative and Evaluate, M = Analyze and Apply, L = Understand and Remember

34	TN012	Linear Algebra and Analytic Geometry		L	L				L			L	L	L
35	TN048	General Physics		М					L			L	L	L
Disci	plinary k	nowledge												
36	CN100	Introduction to Engineering				L	L	L	L	L	L	L	L	
37	CT138	Engineering Mathematics		Μ	L				L			L		L
38	CN136	Engineering mechanics		L	L	L			L		L	L		L
39	CN142	Theory of Machines and Mechanisms		Μ	L	L			L		L	L		Μ
40	KC379	Technical Drawing		L	L	L			L		L	L	L	L
41	CN149	Hydraulic and Pneumatics Transmission		Μ	L	L			L				L	L
42	CN137	Strength of Materials		Μ	L	L			L	L	L	L	L	
43	CN145	Fundamentals of Machine Design		Μ	L	L			L		L	L		Μ
44	KC347	Electronics Circuits		М	L	L			L	L	L	L		L
45	CT131	Basic Programming - Electronics			L	L			L	L	L	L		L
46	KC349	Basic Pulse – Digital Circuits		М	L	L			L	L	L	L	L	Μ
47	CN425	Engineering Material and Technology		L	L	L			L		L	L		L
48	CN162	Practice for Basic Metal Technology		L		L	L		L		L	L	L	
49	CN138	Tolerance and Measurement		L		L			L	L	L	L	L	
50	CN563	Design and Analysis of Experiments		L	L	L			L	L	L	L		
In-de	pth disci	plinary knowledge												
51	CT395	Power Electronics and Applications		М	L	L	L	L	L	L	М	М	L	Μ
52	CT396	Practice in Power Electronics and		М	L					М	М	М	L	L
53	KC353	Modeling and Simulation		м	T	м			м	м	м	м	T	м
54	CT377	Automatic Control Theory		M	I	M			M	M	IVI	IVI	L	M
55	CT279	Sensors and Transducers		M	I	IVI			M	M	м	т	т	M
55	C1570	Programmable Logic Controller		IVI	I	L M	т	т	M	M	M	L T	L I	M
57	VC221	Programmable Logic Controller		п		M		L	M	M	IVI		L M	
50	CT290	Basic Electronics Project		п	L I	M	IVI	IVI	M	M			M	п
50	C1500	Koboucs Engineering		т	L	IVI	L		M	M	M	M	IVI	п
59	CN381 CN416	Microcontroller			L		м	м	M	M	M	M		M
00	CN410	Mechatronics System Design		н	L	M	M	M	M	M	M	M	M	н
01	CN510	Mechatronics Project		н	L	M	IVI	M	M	M	IVI T	M	M	н
62	CN582	Actuators for Mechatronics		M	L	IVI T	L	L	L					M
63	CN392	CAD, CAM, CNC	м		L		т	т			M	M		M
64	KC38/	Internship for Mechatronics Engineering	M	L	L	M	L	L	M	M	H	H	H	H
65	C1397	Computer Measurement and Control				M			M	M		L		M
66	CN159	English for Mechatronics			н									
6/	XH019	French for Science and Technology			н						L		L	L
68	CN414	Management									М	М	М	
69	CT400	Senior Seminar in Control Engineering			L	Μ	L	L	М	Μ	Μ	М	Μ	Н
70	CN298	Industrial Networks and Communication		Μ	L	L			Μ	Μ	Μ	L	L	Μ
71	KC326	IoT Technology and Applications		L	L	L	L	L	Μ	Μ	Μ	Μ	L	Μ
72	CT409	Embedded Programming		L	L	L			Μ	Μ	Μ	Μ	L	Μ
73	CT384	Artificial Neural Network		L	L	М	L	L	М	М	М	М	L	Н
74	KC329	Engineering Projects in Community Service – EPICS		Н	L	М	L	L	М	М	М	М	М	Н
75	KC365	SCADA (Supervisory Control and Data		L	L	М	L	L	М	М	М	М	L	Н
76	KC506	Bachelor's Thesis - Mechatronics		Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н
77	KC399	Final Project - Mechatronics	1	М	Н	Н	М	М	Н	Н	Н	М	Н	H
78	CT398	Fuzzy Control		L	L	M		-	М	М	M	М	L	H
79	CT376	Industrial Control Electronics	1	M	L	L	L	L	М	М	М	L	L	М
80	KC378	Application of Wind and Solar Energy		L	Ľ	Ē	Ē	Ē	L	L	L		L	M
	W CO TO	Power Conversion Interfaces for Renewable	1		-	- -					- -	-	-	
81	KC360	Energy System			L	L			М	M	L	L	L	
82	KC345	Modern Control Theory		М	L	М			М	М	L		L	М
83	CN408	Production and Operations Management	ſ	[[М	М		ſ	М	М	L	
84	CN449	Engineering Economy	l				М	М			М	М	L	
1	1		1	1		1	1			1	1			

II. CURRICULUM PLAN

Pursuant to the Decision No. 3019/QĐ-ĐHCT dated July 31, 2020 of the Rector of Can Tho University for issuing the undergraduate training program, the Mechatronics Engineering program is described as follows.

II.1. Program structure

Total credicts	: 150 credits
Fundamental knowledge	: 50 credits (Compulsary credits: 35; Elective credits: 15)
Disciplinary knowledge	: 41 credits (Compulsary credits: 41; Elective credits: 0)

In-depth disciplinary knowledge : 59 credits (Compulsary credits: 37; Elective credits: 22)

II.2. Curriculum

No.	Course ID	Course title	No. of credits	Compulsory	Elective	Lecture hours	Practice hours	Prerequisite	Corequisite	Semester of enrollment
Fu	ndament	al knowledge								
1	QP010	National defense and security education 1 (*)	2	2		37	8	Program-	based class	sification
2	QP011	National defense and security education 2 (*)	2	2		22	8	Program-	based class	sification
3	QP012	National defense and security education 3 (*)	2	2		14	16	Program-	based class	sification
4	QP013	National defense and security education 4 (*)	2	2		4	56	Program-	based class	sification
5	TC100	Physical education 1+2+3 (*)	1 + 1 + 1		3		90			I,II,III
6	XH023	General English 1 (*)	4			60				I,II,III
7	XH024	General English 2 (*)	3			45		XH023		I,II,III
8	XH025	General English 3 (*)	3	English		45		XH024		I,II,III
9	XH031	Level B1 English 1 (*)	4	English	10	60		XH025		I,II,III
10	XH032	Level B1 English 2 (*)	3		credits	45		XH031		I,II,III
11	XH033	Level B1 English 3 (*)	3		for English	45		XH032		I,II,III
12	FL001	General French 1 (*)	4		or	60				I,II,III
13	FL002	General French 2 (*)	3		French	45		FL001		I,II,III
14	FL003	General French 3 (*)	3	Franch	group	45		FL002		I,II,III
15	FL007	Intensive French 1 (*)	4	French		60		FL003		I,II,III
16	FL008	Intensive French 2 (*)	3			45		FL007		I,II,III
17	FL009	Intensive French 3 (*)	3			45		FL008		I,II,III
18	TN033	Basic Informatics (*)	1	1		15				I,II,III
19	TN034	Basic Informatics in Labs (*)	2	2			60		TN033	I,II,III
20	ML014	Marxist – Leninist Philosophy	3	3		45				I,II,III
21	ML016	Marxist – Leninist Political Economy	2	2		30		ML014		I,II,III
22	ML018	Scientific Socialism	2	2		30		ML016		I,II,III
23	ML019	History of the Communist Party of Viet Nam	2	2		30		ML018		I,II,III
24	ML021	Ho Chi Minh's thought	2	2		30		ML019		I,II,III
25	KL001	General law	2	2		30				I,II,III
26	ML007	Basic logic	2		2	30				I,II,III
27	XH028	Overview of Sociology	2		2	30				I,II,III

No.	Course ID	Course title	No. of credits	Compulsory	Elective	Lecture hours	Practice hours	Prerequisite	Corequisite	Semester of enrollment	
28	XH011	Basic Vietnamese Culture	2			30				I,II,III	
29	XH012	Vietnamese in Use	2			30				I,II,III	
30	XH014	General management documents and archives	2			30				I,II,III	
31	KN001	Transferable skills	2			20	20			I,II,III	
32	KN002	Entrepreneurship and Innovation	2			20	20			I,II,III	
33	TN099	Calculus	4	4		60				I,II,III	
34	TN012	Linear Algebra and Analytic Geometry	4	4		60				I,II,III	
35	TN048	General Physics	3	3		45				I,II,III	
Subtotal: 50 credits (Compulsary credits: 35; Elective credits: 15)											
Disciplinary knowledge											
36	CN100	Introduction to Engineering	2	2		15	30			I,II	
37	CT138	Engineering Mathematics	2	2		30		TN099, TN012		I,II	
38	CN136	Engineering mechanics	3	3		30	30			I,II	
39	CN142	Theory of Machines and Mechanisms	3	3		30	30	CN136		I,II	
40	KC379	Technical Drawing	2	2		20	20			I,II	
41	CN149	Hydraulic and Pneumatics Transmission	2	2		20	20			I,II	
42	CN137	Strength of Materials	3	3		30	30	CN136		I,II	
43	CN145	Fundamentals of Machine Design	3	3		30	30	CN137		I,II	
44	KC347	Electronics Circuits	4	4		45	30			I,II	
45	CT131	Basic Programming - Electronics	3	3		30	30	TN033		I,II	
46	KC349	Basic Pulse – Digital Circuits	3	3		30	30	KC347		I,II	
47	CN425	Engineering Material and Technology	3	3		35	20	~~~~~~		I,II	
48	CN162	Practice for Basic Metal Technology	3	3		• •	90	CN425		I,II	
49	CN138	Tolerance and Measurement	2	2		20	20			I,II	
50	CN563	Design and Analysis of Experiments	3	3	41 51	30	30			1,11	
In-	depth dis	Subtotal: 41 credits (Compute	sary credit	s: 41; EI	ective cr	edits: 0)				
51	CT395	Power Electronics and Applications	2	2		30				I,II	
52	CT396	Practice in Power Electronics and Applications	1	1			30	CT395		I,II	
53	KC353	Modeling and Simulation	3	3		30	30			I,II	
54	CT377	Automatic Control Theory	3	3		40	10	CT138		I,II	
55	CT378	Sensors and Transducers	2	2		20	20			I,II	
56	CN579	Programmable Logic Controller	3	3		30	30	KC349		I,II	
57	KC331	Basic Electronics Project	2	2			60			I,II	
58	CT380	Robotics Engineering	3	3		30	30	TN012		I,II	
59	CN581	Microcontroller	3	3		30	30			I,II	
60	CN416	Mechatronics System Design	2	2		30		KC379		I,II	
61	CN516	Mechatronics Project	2	2			60	CN416		I,II	
62	CN582	Actuators for Mechatronics	3	3		30	30			I,II	
63	CN392	CAD, CAM, CNC	3	3		30	30			1,11	
64	KC387	Engineering	2	2			60			III	

No.	Course ID	Course title	No. of credits	Compulsory	Elective	Lecture hours	Practice hours	Prerequisite	Corequisite	Semester of enrollment
65	CT397	Computer Measurement and Control	3	3		30	30	CT378		I,II
66	CN159	English for Mechatronics	2			30		XH025		I,II
67	XH019	French for Science and Technology	2			30				III
68	CN414	Industrial Maintenance Engineering and Management	2			20	20			I,II
69	CT400	Senior Seminar in Control Engineering	2				60			I,II
70	CN298	Industrial Networks and Communication	2		8	15	30	CN579		I,II
71	KC326	IoT Technology and Applications	3			30	30			I,II
72	CT409	Embedded Programming	3			30	30			I,II
73	CT384	Artificial Neural Network	3			30	30	CT377		I,II
74	KC329	Engineering Projects in Community Service – EPICS	2			30				I,II
75	KC365	SCADA (Supervisory Control and Data Acquisition)	3			30	30	CN579		I,II
76	KC506	Bachelor's Thesis - Mechatronics	14				420	\geq 120 TC		I,II
77	KC399	Final Project - Mechatronics	6				180	\geq 120 TC		I,II
78	CT398	Fuzzy Control	2			20	20	CT377		I,II
79	CT376	Industrial Control Electronics	3			30	30			I,II
80	KC378	Application of Wind and Solar Energy	3		14	30	30			I,II
81	KC360	Power Conversion Interfaces for Renewable Energy System	3		11	30	30			I,II
82	KC345	Modern Control Theory	2			20	20	CT377		I,II
83	CN408	Production and Operations Management	2			20	20			I,II
84	CN449	Engineering Economy	2			20	20			I,II
	Subtotal: 59 credits (Compulsary credits: 37; Elective credits: 22)									
		Total: 150 credits (Co	mpulsar	y credits:	113; Ele	ective cre	edits: 37))		

II.3. Curriculum plan

No.	Course ID	Course title	No. of credits	Compulsory	Elective	Lecture hours	Practice hours	Prerequisite	Notes			
Sen	Semester 1											
1	QP010	National defense and security education 1 (*)	2	2		37	8	Program-t classificat	based ion			
2	QP011	National defense and security education 2 (*)	2	2		22	8	Program-t classificat	based ion			
3	QP012	National defense and security education 3 (*)	2	2		14	16	Program-t classificat	based ion			
4	QP013	National defense and security education 4 (*)	2	2		4	56	Program-l classificat	based ion			
5	KL001	General law	2	2		30						
6	TN009	Calculus	4	4		60						
		Subtotal	14	14	0							
Sen	Semester 2											

No.	Course ID	Course title	No. of credits	Compulsory	Elective	Lecture hours	Practice hours	Prerequisite	Notes
1	ML014	Marxist – Leninist Philosophy	3	3		45			
2	TC100	Physical education 1 (*)	1		1		30		Elective
3	XH023	General English 1 (*)	4		4	60			Flective
4	FL001	General French 1 (*)	4		-	60			Liceuve
5	TN033	Basic Informatics (*)	1	1					Able to be
6	TN034	Basic Informatics in Labs (*)	2	2					equivalent by certificate
7	TN048	General Physics	3	3		45			
8	CN100	Introduction to Engineering	2	2		15	30		
9	ML007	Basic logic	2			30			
10	XH028	Overview of Sociology	2			30			
11	XH011	Basic Vietnamese Culture	2			30			
12	XH012	Vietnamese in Use	2		2	30			Elective
13	XH014	General management documents and archives	2			30			
14	KN001	Transferable skills	2			20	20		
15	KN002	Entrepreneurship and Innovation	2			20	20		
		Subtotal	18	11	7				
Sem	ester 3								
1	TN012	Linear Algebra and Analytic Geometry	4	4		60			
2	CT131	Basic Programming - Electronics	3	3		30	30	TN033	
3	CN563	Design and Analysis of Experiments	3	3		30	30		
4	CN136	Engineering mechanics	3	3		30	30		
5	XH024	General English 2 (*)	3		3	45		XH023	Elective, Able to be
6	FL002	General French 2 (*)	3			45		FL001	by certificate
7	TC100	Physical education 2 (*)	1		1		30		Elective
8	ML016	Marxist – Leninist Political Economy	2	2		30		ML014	
		Subtotal	19	15	4				
Sem	ester 4			[1	1	[I	
1	CT138	Engineering Mathematics	2	2		30		TN099, TN012	
2	KC353	Modeling and Simulation	3	3		30	30		
3	KC347	Electronics Circuits	4	4		45	30		
4	KC379	Technical Drawing	2	2		20	20		
5	CN142	Theory of Machines and Mechanisms	3	3		30	30	CN136	
6	XH025	General English 3 (*)	3		3	45		XH024	Elective
7	FL003	General French 3 (*)	3		_	45		FL002	
8	TC100	Physical education 3 (*)	1		1		30		Elective
9	ML018	Scientific Socialism	2	2		30		ML016	
		Subtotal	20	16	4				

No.	Course ID	Course title	No. of credits	Compulsory	Elective	Lecture hours	Practice hours	Prerequisite	Notes
Sem	ester 5								
1	CT377	Automatic Control Theory	3	3		40	10	CT138	
2	CN425	Engineering Material and Technology	3	3		35	20		
3	KC349	Basic Pulse – Digital Circuits	3	3		30	30	KC347	
4	CN138	Tolerance and Measurement	2	2		20	20		
5	CN137	Strength of Materials	3	3		30	30	CN136	
6	CT395	Power Electronics and Applications	2	2		30			
7	ML019	History of the Communist Party of Viet Nam	2	2		30		ML018	
		Subtotal	18	18	0				
Sem	ester 6				_	-	-	-	
1	CN162	Practice for Basic Metal Technology	3	3			90	CN425	
2	CN579	Programmable Logic Controller (PLC)	3	3		30	30	KC349	
3	CN581	Microcontroller	3	3		30	30	CN581	
4	KC331	Basic Electronics Project	2	2			60		
5	CN145	Fundamentals of Machine Design	3	3		30	30	CN137	
6	CT396	Practice in Power Electronics and Applications	1	1			30	CT395	
7	ML021	Ho Chi Minh's thought	2	2		30		ML019	
		Subtotal	17	17	0				
Sem	ester 7								
1	CT380	Robotics Engineering	3	3		30	30	TN012	
2	CT378	Sensors and Transducers	2	2		20	20		
3	CN416	Mechatronics System Design	2	2		30		KC379	
4	CN392	CAD, CAM, CNC	3	3		30	30		
5	CN582	Actuators for Mechatronics	3	3		30	30		
6	CN414	Industrial Maintenance Engineering and Management	2		-	20	20		
7	CT400	Senior Seminar in Control Engineering	2		_		60		
8	CT384	Artificial Neural Network	3		4	30	30	CT377	Elective
9	KC329	Engineering Projects in Community Service – EPICS	2			30			
10	KC365	SCADA (Supervisory Control and Data Acquisition)	3			30	30	CN579	
		Subtotal	17	13	4				
Sem	ester 8								
1	CN516	Mechatronics Project	2	2			60	CN416	
2	CT397	Computer Measurement and Control	3	3		30	30	CT378	
3	CN149	Hydraulic and Pneumatics Transmission	2	2		20	20		
4	CN159	English for Mechatronics	2			30		XH025	
5	XH019	French for Science and Technology	2		4	30			Elective
7	CN298	Industrial Networks and Communication	2			15	30	CN579	2.000,0

No.	Course ID	Course title	No. of credits	Compulsory	Elective	Lecture hours	Practice hours	Prerequisite	Notes
8	KC326	IoT Technology and Applications	3			30	30		
9	CT409	Embedded Programming	3			30	30		
10	KC387	Internship for Mechatronics Engineering	2	2			60	KC387	
		Subtotal	13	9	4				
Sem	ester 9								
1	KC506	Bachelor's Thesis - Mechatronics	14				420	\geq 120 TC	
2	KC399	Final Project - Mechatronics	6				180	\geq 120 TC	
3	CT398	Fuzzy Control	2			20	20	CT377	
4	CT376	Industrial Control Electronics	3			30	30		
5	KC378	Application of Wind and Solar Energy	3		14	30	30		Students can select
6	KC360	Power Conversion Interfaces for Renewable Energy System	3			30	30		thesis or project
7	KC345	Modern Control Theory	2			20	20	CT377	
8	CN408	Production and Operations Management	2			20	20		
9	CN449	Engineering Economy	2			20	20		
		Subtotal	14	0	14				
		Total	150	113	37				

II.4. Roadmap



Note: The Internship for Mechatronics Engineering course (KC387) is opened only in the third semester of the year of Semester 6 or 8

II.5. Courses descriptions

No.	Course ID	Course title	No. of credits	Brief description	Teaching Unit
1	QP010	National defense and security education 1 (*)	2	This course aims to mention the fundamental theory of Marxism – Leninism on strategies of the military including the fundamentals of Marx-Lenin theory, Ho Chi Minh ideology on war, military, and national protection; the viewpoints of Communist Party of Vietnam on the People's war, the buildup of military forces, people-based national defence; the viewpoints of Communist Party of Vietnam on the combination of economic-social development with the strengthening of the national defence and security. Spending a certain amount of time on introducing some basic contents of the history of Vietnam's war tactics throughout all periods. The building, protecting the possession of border and the sea islands, national security and guarantee of the social order.	Center of National Defense Education
2	QP011	National defense and security education 2 (*)	2	Some basic contents of the mission on national defense activities and security of the Party and government in the new situation can be chosen including the buildup of militia and self-defense forces, mobilization forces, strengthening the infrastructure potential, military technology, beat the peaceful evolution's strategies and the overthrow of the hostile forces with Vietnamese revolution. This course aims to mention some ethnic and religious issues and fighting to prevent the opponents from taking advantage of ethnic and religious issues to disrupt the Vietnamese revolution; fighting to prevent the criminals and maintenance the social order, fighting to prevent the criminals on the internet and non-traditional security threats in Vietnam.	Center of National Defense Education
3	QP012	National defense and security education 3 (*)	2	This course aims to mention the general military contents to provide the learners the fundamental knowledge of military activities, formal orders, basic skills to execute the movements of command orders and necessary skills in the army, basic knowledge on maps, military terrain, preventing the invasion by high-tech weapons, physical health training through the military contents.	Center of National Defense Education
4	QP013	National defense and security education 4 (*)	2	This course aims to mention the theory contents combining with experiences to provide the learners with some basic skills of experiencing shooting techniques of AK submachine gun, practicing the skills of using grenades in combat, practicing the combat skills in attack, defense, watch duty, and realm.	Center of National Defense Education

5	TC100	Physical education 1+2+3 (*)	1+1+1	Non-professional physical education course 1+2+3 is a general course representing the physical courses for non- professional students of the physical education major who have to study to complete the training course of their major. To complete the physical education course, instead of register TC100 course, students have to register for some specific courses depending on their ability and interests, such as: for the Taekwondo course, students must register for three specific courses including Taekwondo 1 (TC003), Taekwondo 2 (TC004), and Taekwondo 3 (TC005); the other specific physical education courses in the following list are registered by the same manner.	Department of Physical Education
6	XH023	General English 1 (*)	4	General English 1 (XH023) provides students with common words for daily communication, focusing on personal details, family, hometown, objects, sports, leisure activities, shopping, foods and drink, festivals, cultures and means of transportation. The purpose of this course is to promote students' communicating ability for those familiar topics, and besides, to aim at achieving mid- level 2 of Vietnamese Standardized Test of English Proficiency (VSTEP).	School of Foreign Languages
7	XH024	General English 2 (*)	3	General English 2 (XH024) provides students with common words for daily communication, focusing on films and the art, tourism, fashion, science, technology, and environment. The purpose of this course is to promote students' communicating ability for those familiar topics, and besides, to aim at achieving high-level 2 of Vietnamese Standardized Test of English Proficiency (VSTEP).	School of Foreign Languages
8	XH025	General English 3 (*)	3	General English 3 (XH025) provides students with essential revision of common words that they obtained in General English 1 & 2 for daily communication such as personal details, family, hometown, objects, sports, leisure activities, shopping, foods and drink, festivals, cultures, tourism, studies, etc. The purpose of this course is to promote students' communicating ability for those familiar topics, and besides, to aim at achieving low-level 3 of Vietnamese Standardized Test of English Proficiency (VSTEP).	School of Foreign Languages
9	XH031	Level B1 English 1 (*)	4	Advanced English 1 course (an optional course) helps students improve their English proficiency and communication skills in English about common topics. Primary features and components of the course include: (1) competence-based learning, (2) integrated and blended learning, (3) promoting learner independence in learning, (4) learning by interaction and doing, (5) purposeful learning and (6) flexibility. Apart from developing learners' English communication skills and English competence, the course also aims to help students achieve low-level 3 in VSTEP (Vietnamese Standardized Test of English Proficiency) framework.	School of Foreign Languages
10	XH032	Level B1 English 2 (*)	3	Advanced English 2 course (an optional course) helps students improve their English proficiency and communication skills in English about familiar topics.	School of Foreign Languages

				Primary features and components of the course include: (1) competence-based learning, (2) integrated and blended learning, (3) promoting learner independence in learning, (4) learning by interaction and doing, (5) purposeful learning and (6) flexibility. Apart from developing learners' English communication skills and English competence, the course also aims to help students achieve mid-level 3 in VSTEP (Vietnamese Standardized Test of English Proficiency) framework.	
11	XH033	Level B1 English 3 (*)	3	Advanced English 3 course (an optional course) helps students improve their English proficiency and communication skills in English about common topics. Primary features and components of the course include: (1) competence-based learning, (2) integrated and blended learning, (3) promoting learner independence in learning, (4) learning by interaction and doing, (5) purposeful learning and (6) flexibility. Apart from developing learners' English communication skills and English competence, the course also aims to help students achieve high-level 3 in VSTEP (Vietnamese Standardized Test of English Proficiency) framework.	School of Foreign Languages
12	FL001	General French 1 (*)	4	Course content aims to help student familiar with pronunciation, intonation, alphabet of French. Student also learn how to conjugate verbs in diffrent tenses group I, group II, group III. Besides, student also learn basics function such as: hello, self introduction, family and hobbies and write basic sentences. Student also get knowledge of grammar, vocabulary and common language criteria of French as defined for level 3 in the framework of Vietnamese language proficiency	School of Foreign Languages
13	FL002	General French 2 (*)	3	 Knowledge: The module continues to equip learners pronouns, tense usage, possessive adjectives of French. Student learn writing an invitation letters, answer the letter, describe daily life and future plan. Student can write some simple sentences, conjugate verbs in group I, group II and some simple verds at group III. Learning skill: The ability to use France as level 3 in Vietnamese language proficiency framework. The ability to introduce holiday such as: Tet holiday, food, stuffs, clothes, talk a story in the past, writing short sentences, reading a small France paragraph. 	School of Foreign Languages
14	FL003	General French 3 (*)	3	Basic French module 3 will provide non-French students with knowledge of daily communication situations such as talking about holidays, New Year, food, describing people in France society. In this module, student learn knowledge of verds, grammars, communication situation in France suac as: relaxing, future plan and France holidays. Student also learn basic communication situations in the cultural, social and daily life of the French.	School of Foreign Languages

				The Intensive French Language Course 1 will provide non-French majors with the knowledge of everyday life situations about introducing family, describing people, entertainment, hobbies, jobs in France and other	
				countries in International organization of Francophonie so student can attend the DELF B1 France test. Student learn communication skill due to communication	
			4	situation in cultural, society and daily life of France.	School of Foreign
15	FL007	Intensive French 1 (*)		Student learn how to use conjugate verbs, verbs, pronounciation and other France standard languages which is shown in level 3 in Vietnamese language proficiency framework.	
				Skills: The ability to use France as level 3 in Vietnamese language proficiency framework.	Lunguages
				The ability to express daily activities such as: introduce family, houses, hobbies, personal feeling and writing short sentences, reading and understanding a small france paragraph.	
				Soft skills: Communicate, work and learn in multi-cultural environment	
				Altitude: Student have to be positive, enthusiastic, conscious of learning	
16	FL008	Intensive French 2 (*)	3	The Intensive French Language Course 2 will provide non-French majors with the knowledge of everyday life situations about introducing family, describing people, entertainment, hobbies, jobs in France and other countries in International organization of Francophonie so student can attend the DELF B1 France test. Student learn communication skill due to communication situation in cultural, society and daily life of France. Student learn how to use conjugate verbs, verbs, pronounciation and other France standard languages which is shown in level 3 in Vietnamese language proficiency framework. Skills: The ability to use France as level 3 in Vietnamese language proficiency framework. The ability to express daily activities such as: introduce family, houses, hobbies, personal feeling and writing short sentences, reading and understanding a small france paragraph. Soft skills: Communicate, work and learn in multi-cultural environment Altitude: Student have to be positive, enthusiastic, conscious of	School of Foreign Languages
				learning	
17	FL009	Intensive French 3 (*)	3	The Intensive French Language Course 2 will provide non-French majors with the knowledge of everyday life situations about introducing family, describing people, entertainment, hobbies, jobs in France and other countries in International organization of Francophonie so student can attend the DELF B1 France test.	School of Foreign Languages

				Student learn communication skill due to communication situation in cultural, society and daily life of France. Student learn how to use conjugate verbs, verbs, pronounciation and other France standard languages which is shown in level 3 in Vietnamese language proficiency framework. Skills: The ability to use France as level 3 in Vietnamese language proficiency framework. The ability to express daily activities such as: introduce family, houses, hobbies, personal feeling and writing short sentences, reading and understanding a small france	
				paragraph. Soft skills: Communicate, work and learn in multi-cultural environment Altitude: Student have to be positive, enthusiastic, conscious of learning	
18	TN033	Basic Informatics (*)	1	This course aims to provide learners on basic knowledge of information technology including information concepts, computer architecture, Windows operating system, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, using the Internet, and E-mail.	College of ICT
19	TN034	Basic Informatics in Labs (*)	2	This course aims to support learners on applying the knowledge learnt in the TN033 course through practice on computers, learners are improved their practice skills on manipulating Windows operating system, Microsoft Word, Microsoft Excel, Microsoft PowerPoint; using the Internet, and E-mail. This course also integrate skills on writing the scientific paper and preparing the presentation.	College of ICT
20	ML014	Marxist – Leninist Philosophy	3	This subject provides basic and in-depth knowledge of Marxist-Leninist philosophy. It includes (i) Marxist- Leninist philosophy and its role of in the society; (ii) Dialectical materialism: matter and consciousness, material dialectics and epistemology; (3) Historical materialism: Socio-economic morphology, class and ethnic group, State and social revolution, social consciousness as well as human philosophy.	School of Political Science
21	ML016	Marxist – Leninist Political Economy	2	The subject focuses on the Vietnamese Political Economy that help students understand the national economic context, development strategy and policy. It includes some specific issues as follows: (1) commodity and market: the law of the market economy; the characters of commodity; (2) Marxist theory of surplus value: the definition of surplus value; the variety of the forms of surplus value and the application of the theory to the Vietnamese context; (3) The Vietnamese economic model: Vietnamese economic transition and the new model (market-oriented economy).	School of Political Science
22	ML018	Scientific Socialism	2	In this subject, students will study the basic theoretical issues of socialism and the reality of building socialism in Vietnam today. The main content of the subject focuses	School of Political Science

				on issues such as the establishment and development of scientific socialism; The historic mission of the working class; Socialism and the transition to socialism; The alliance of classes and the classes; The issue of ethnicity and religion; The family problems in the transition to socialism.	
23	ML019	History of the Communist Party of Viet Nam	2	Equip students with the knowledge of objects, purposes, tasks, research methods, study of Party History and the basic, core, systematic knowledge about the birth of the Party (1920- 1930); the Party leading the struggle for power (1930-1945); led two resistance wars against French colonialism and American imperialism, completing the national liberation and unification (1945 1975); lead the country transitionally to socialism and carry out the doi moi (1975-2018). Thereby affirming the successes, raising the limitations, summarizing the experiences of the revolutionary leadership of the Party to help learners raise awareness, belief in the Party and the ability to apply the learned knowledge. into working practice, contributing to building and defending the Socialist Vietnam Fatherland.	School of Political Science
24	ML021	Ho Chi Minh's thought	2	Related with Marxist - Leninist Philosophy, Marxist - Leninist political economy, Scientific socialism and History of the Communist party of Vietnam, Ho Chi Minh's thought help all of students achieve the basic knowledge about the idealogy, the guideline of Communist party of Vietnam and Vietnam revolution. Ho Chi Minh's thought continues to complement the knowledge of Marxist - Leninist, to have a part in improving moral values of human. This course consists of six chapters, including main contents of Ho Chi Minh's thought according to the objectives of its, it provides the systematic ideology, morality and cultural values from Ho Chi Minh President's thought.	School of Political Science
25	KL001	General law	2	This module is designed to teach students who are not major in Law. The module introduces the basic theoretical issues of the Marxist-Leninist theory about the state and the law from the origin, nature, form, function as well as the types of state and the law that formed and existed and developed through different socio-economic forms in human history. In addition, the module also includes the study of the position of the state in the political system, the composition of the state apparatus, the systems of state agencies. A large amount of basic knowledge in the common law disciplines of Vietnam is also introduced such as basic rights and obligations of citizens, crimes, violation of administrative laws, provisions of the law on marriage, divorce, inheritance	School of Law
26	ML007	Basic logic	2	The module equips the knowledge of formal logic. It provides the rules and requirements of the basic laws of thought such as the law of identity, the law of non- contradiction, the law to reject the third, and the law of full reasoning. It also provides the basic forms of thinking such as: concept, judgment, deductive, hypothesis, prove, rebuttal, and sophistry.	School of Political Science

27	XH028	Overview of Sociology	2	The subject studies the law, the regularity of the formation, the movement to change the relationship, the interaction between human and society. Research object of sociology is social relations, social interactions manifested through behavior between people in groups, organizations, social systems.	School of Social Sciences and Humanities
28	XH011	Basic Vietnamese Culture	2	The fundamental knowledge of this course is presented in 5 chapters. Types of Vietnamese cultures are mentioned in Chapter 1 after introducing some concepts and necessary scientific terms, such as culture, culture exchange, and acculturation. Chapters 2 to 4 describe knowledge of aspects of cultural values with demonstrations of the diversity and abundance of them in the physical and spiritual life of Vietnamese people. Chapter 5 concentrates on surveying the characteristics of the identity and future of national culture.	School of Education
29	XH012	Vietnamese in Use	2	This course is designed into 4 chapters, each chapter consists of two primary parts that are compiled interwovenly including simplified theory and wide-range of practical exercises. Chapter 1 focusses on word and spelling problems. Chapter 2 pays attention to gain the ability of word use. Similarly, Chapter 3 concentrates on training about skills on sentences. The last chapter aims to practise skills on creating and receiving documents.	School of Education
30	XH014	General management documents and archives	2	The textual and archival text module in order to equip theoretical and practical knowledge about management documents and archives, helping students to realize the role of administrative documents and archives with management. In addition, this module also helps learners master the method of composing and scientific management of various types of administrative documents, knowing how to select and classify documents for archiving; know how to search, use archives to be able to do a good job of management at schools as well as at agencies in general.	School of Social Sciences and Humanities
31	KN001	Transferable skills	2	This course provides the basic knowledge and instruction to train the essential skills for learners, such as communication skills, basic principles of communication; effective listening, speaking and presentation skills; teamwork skills to ensure a good co-operation in learning and working; creative thinking skills; time and emotional management skills.	Center for Student Consultancy and Start-up
32	KN002	Entrepreneurship and Innovation	2	The content of the course focuses on general knowledge about creating, innovating and forming startup ideas, choosing the type of business ownership, basic understanding of intellectual property rights. In addition, students are provided with basic knowledge and skills on the market, such as assessing strengths, opportunities, threats, risks of commercializing products from business ideas, discovering business potential and start-up planning. More importantly, students have opportunities to be shared the start-up experiences from successful entrepreneurs and/or onsite visited successful startup models.	Center for Student Consultancy and Start-up

33	TN099	Calculus	4	The course provides the fundamentals of derivatives- integrals and applications in 6 chapters. Chapter 1 introduces functions, limits, and continuity. Chapter 2 presents the derivatives and differentials of the one- variable function and its application. Chapter 3 deals with the integrals of a one-variable function and its application. Chapter 4 presents the integral of the multivariable function. Chapter 5 discusses on double and triple integrals and their applications in geometry and physics. Chapter 6 considers on differential equations.	College of Natural Sciences
34	TN012	Linear Algebra and Analytic Geometry	4	The coures provides learners on fundamental knowledge of Linear Algebra, such as the system of linear equations, matrices, determinant, linear space, linear mapping, eigenvalues and eigenvectors, quadratic form and basic knowledge of quadratic line in the plane, quadratic plane in space for canonical equations to continue learning other mathematics courses and disciplinary courses. Besides, this course also provides a system of diverse exercises arranged from easy to difficult and advanced exercises to gain the thinking ability of students.	College of Natural Sciences
35	TN048	General Physics	3	This course including 13 chapters provides learners the knowledges on particle dynamics. General laws of the particle dynamics, forces in mechanics. Laws of conservation. The motion types of solids, the basic motion equation of particle system and the solids. Concepts, theorems, and laws of momentum, angular momentum, mechanical energy, and Huygen's theorem about moment of inertia. Concepts, continuity equations, fundamental equations of ideal fluids, Bernoulli's principle, Pascal's law, and internal friction phenomenon. Types of mechanical oscillation, synthesis and analysis of oscillation, interference and the principle of mechanical diffraction, Huygen's principle, Doppler effect, etc. Molecular kinetics, equation of state for ideal gases, surface tension, the basic principles of thermodynamics. The formation of electric fields, magnetic fields, interference, diffraction, etc. Fundamental laws and characteristics of electricity, magnetism and optical waves; properties of conductors, dielectricity, magnetic materials and light in the environment. Radioactivity, fission, fusion and application. From there, students can understand and explain related natural phenomena, principal structure and operation of basic mechanical, thermal, electrical, and optical equipments. In addition, this course is one of the basic one to help technical students study well disciplinary courses and in-depth disciplinary courses.	College of Natural Sciences
36	CN100	Introduction to Engineering	2	The Introduction to Engineering course introduces the engineering design process, basic engineering skills, and provides opportunities to learn about and use various engineering tools and software. The course will also teach basic written and oral communication skills for communicating technical information effectively. Student will learn to work in a team environment, using design methods to address multi-disciplinary real world engineering design problems. Along with the soft skills	College of Engineering Technology

				training modules also students of professional ethics as well as building awareness and responsibility of the engineer with the expectations of society.	
37	CT138	Engineering Mathematics	2	Students of engineering work with a system, component and/or process to process data. These works are related to the stages of modeling, designing, analyzing, evaluating and interpreting data. This course helps the students use basic mathematical tools: Laplace transforms, Fourier transforms, and Z transforms to solve real world situations of engineering.	College of Engineering Technology
38	CN136	Engineering mechanics	3	Engineering mechanics is a part of physics, which provides learners basic knowledge of engineering mechanics. This course is devided in three parts. Part one (statics) deals with forces and the equilibrium of body/ bodies being subjected by forces. Part two (kinematics) mainly deals with the calculation of velocity and acceleration of particles or bodies. Part three (kinetics) mainly deals with the moving principles of particles or bodies subjected by external forces. After fully understanding the three already-mentioned parts, learners could effectively solve technical problems which appear in machines or machinery mechanism.	College of Engineering Technology
39	CN142	Theory of Machines and Mechanisms	3	The theory of machine and mechanism aims to provide principal knowledge of the machine structure and the principles of the machine. This course also provide calculating structural dynamics, working efficiency of the machine, a method to help the machine balance as well as stabilize during operation time. The course also introduces common mechanisms using in machine design. Provide knowldeges of dynamics gearboxes.	College of Engineering Technology
40	KC379	Technical Drawing	2	The technical drawing is one of core modules in the mechatronic engineering program. This subject will provide students the most updated knowledge to ultilize mordern software and tools for automatic and precise drawing on computer. The supplied exercises of 2D sketches, 3D structures and assemble presentation of mechanical components and machineries will improve learner's creativity and competences of implementation based on the practical problems. The outcomes of this subject will meet the requirement for conducting projects, thesis and technical presentation.	College of Engineering Technology
41	CN149	Hydraulic and Pneumatics Transmission	2	 This course aims to provide the applications of the hydraulic system and pneumatic system: The hydraulic system: Hunderstand the Pascal's principles in hydraulic transmission and calculation of basic hydraulic principles. Understand the actuators, hydraulic valves, auxiliary equipment and typical hydraulic drive circuits. The pneumatic system: Understand the pneumatic supply and handling system, processing element, control element, actuators and basic pneumatic circuits. 	College of Engineering Technology

				+ Design the pneumatic control system design and the electric - pneumatic control system design.	
42	CN137	Strength of Materials	3	Strength of materials deals with the relations between the internal forces and external forces applied to elastic bodies and the resulting deformations and stresses. In the design of structures and machines, the application of the principles of strength of materials is necessary if satisfactory materials are to be utilized and adequate proportions obtained to resist functional forces.	College of Engineering Technology
43	CN145	Fundamentals of Machine Design	3	 The Fundamentals of Machine Design and Manufacturing aims to provide: 1- Understand and calculate the fundamental problems in machine and machine element system design. 2 - Understand the related of the structure and calculation of rivet, threaded, welded, free, latch joints. 3- Understand design calculation of gear drives, belts, chains, screw gear screws 4- Understand the design of shaft, plain and roller bearings 	College of Engineering Technology
44	KC347	Electronics Circuits	4	This course aims to provide 3 parts: Part 1: introduction the structure, functions, the activation mechanism, calculation basic parameters of the popular semiconductors: Diode, BJT, FET, MOSFET, controller electronics components, opto-conductor components. Part 2: introduction the concept, theorem of the basic laws of electrical circuits: Kirchoff, Norton, Millan, Thevein, Superposition theorem and analyse the basic circuits. The method analyse the DC circuit, AC circuits and transient circuits. Part 3: Provide student the knowledge of the analog circuit applications: diode, BJT FET, op-map applications circuits. The power curcuit, oscillating circuit Provide student knowdege to analyse, design, maintain and repair basic and advance electronics circuits.	College of Engineering Technology
45	CT131	Basic Programming - Electronics	3	The aim of basic programming course provides learners general knowledge of programming languages, data types, and structured data types. Concepts of algorithm and methods to describe the algorithm. In addition, learners are also equipped with a relatively large amount of knowledge about the C programming language, the programming language is well-known and used in today's technology. From there, learners gain an understanding of the important and necessary role of the algorithm and the C language. With good knowledge and skill in C programming language, learners are able to access easily and quickly. Use the C language well in the study and research in the field of expertise later.	College of Engineering Technology
46	KC349	Basic Pulse – Digital Circuits	3	This course aim to provide 2 parts: Part 1: Introduction of the numerical system, boolean algebra, logic function, basic elements of digital electronic circuits, knowledge of combinatorial circuits, sequential circuits and circuit design methods. Part 2: introduction of basic idea about the electrical impulses, types of electrical impulses, RC RL circuits	College of Engineering Technology

				adaption with the electrical impulses and theirs applications. Provide knowledges of classical circuits which generate electrical impulses as: astable multivibrator circuit, Monostable multivibrator circuit, Schmitt Trigger circuit.	
				Mechanics for Materials and Technologies aims to provide Metal concept and classification. Structure of pure metals, alloys. How to represent alloying system by state diagram. Structure of Fe-C alloy system. Fe-C alloy system state diagram. Classification of Fe-C alloys. Transformation of Fe-C alloys when heated and cooled. Fe-C alloy treatment technologies. Alloy on Copper Background. Alloy on Aluminum background. Common metal material standards. - Metal cutting concept. The classification of metal cutting	College of
47	CN425	Engineering Material and Technology	3	 methods. Metal cutting technologies, scope of applications, tools and equipment Concept and classification of metal casting methods. Casting metal in sand molds, making molds by hand and making molds by machines. Metal cooking equipment. Casting design requirements. 	College of Engineering Technology
				 Concept and classification of pressure machining methods. Basic rules in pressure machining. Basic pressure machining technologies. Concept and classification of welding methods. Basic welding technologies. Go and expand mound shape. Cut and mix the tape 	
48	CN162	Practice for Basic Metal Technology	3	This course aims to provide students the basic skills for an engineer in metalworking field including: hand tools using, sheet metalworking, welding, turning, milling, forging, casting.	College of Engineering Technology
49	CN138	Tolerance and Measurement	2	 The course comprises 2 main parts: Tolerance and fits: Students will learn the concepts and calculations about dimensional tolerance, positioning and geometric tolerance, mechanical fits, surface roughness, and dimensional chains Measurements: Students will learn about basic mechanical measurements principles, measurement procedure of basic parameters of mechanical parts and machinery. 	College of Engineering Technology
50	CN563	Design and Analysis of Experiments	3	How to start a research, to answer a question, a doubt or confirm a hypothesis? How to conduct experiments, collect data and how to analyze data to answer the research questions? This course provides the basic concepts, knowledge, and skills to conduct and analyse experiment.	College of Engineering Technology
51	CT395	Power Electronics and Applications	2	This subject provides students with the knowledge of power electronic devices, skills of circuit analysis and design, and operating principle of simple power electronic circuits.	College of Engineering Technology
52	CT396	Practice in Power Electronics and Applications	1	This subject is to help students to verify the theory of power electronic circuits through simulation programs, the experimental model as well as writing the final report.	College of Engineering Technology

53	KC353	Modeling and Simulation	3	 This course aims to provide fundamenal knowledge of simulating of the engineering physical system. Student can simulate a system on computer by using high level programming language: MATLAB/Simulink. Besides, this course also provide knowledge on communication between micro-controller and computers for data collections and controls. The main course includes: Introduction systems, standard physical systems, modelling method and modelling the physical system. Introduction high level control programme MATLAB/Simulink and LABVIEW. Introduction methods data collections and controll by Peripherals 	College of Engineering Technology
54	CT377	Automatic Control Theory	3	Automatic control theory subject offers general knowledges to the learners on the controlled systems and methods of modelling the controlled systems. Moreover, this helps students in evaluating stable criterions of the systems and designing compensators to the linear time invariant systems with some classical controllers such as Lead – Lag compensators, PID controller, On the other hand, the learners will also be taughted how to use the technical software MATLAB for computing, analyzing and designing the controllers of the systems.	College of Engineering Technology
55	CT378	Sensors and Transducers	2	This module provides learners with knowledge of measuring systems. Learners are consolidated their knowledge of physiscal effects that used to make common sensors. the course provides knowledge to help students have the abilities to use, design, and apply the measuring system to life and manufacture. The students are updated new knowledge about modern smart sensors.	College of Engineering Technology
56	CN579	Programmable Logic Controller (PLC)	3	This course aims to provide knowledge of hardware of the PLC controll, the communication principal between controller elements (PLC, contactor, sensors) and PLC programming method. This course provides method to design a control system by using PLC control, self-researches skill,teamwork and presentation. This course is also orientation student about the final projects and graduation essay.	College of Engineering Technology
57	KC331	Basic Electronics Project	2	The basic electronics course follows the terms of electronics subjects. This course help student apply knowledge of electronics knowledge to generate a small application circuits.	College of Engineering Technology
58	CT380	Robotics Engineering	3	This course introduces to students the history and applications of robotics in life. The representation and the transformation of frame, methods of dynamic and kinematic are also decscribed in detail. The course provides students some basic types of manipulator trajectory and trajectory planning problems. Control, sensor, and modelling issues are also covered. Besides, the structure of industrial manipulators are introduced in this course.	College of Engineering Technology

59	CN581	Microcontroller	3	This course aims to provide learners with fundamental knowledge on microcontrollers and MSP430 microcontroller family; designing peripheral circuits connecting to microcontrollers; writing firmware for microcontrollers, analyzing and conducting control algorithms; utilizing simulation software of designing procedures, compiling, and programming the binary program to MSP430 microcontrollers; analyzing, designing fundamental applications for MSP430 microcontrollers.	College of Engineering Technology
60	CN416	Mechatronics System Design	2	This course will provide definition, theory, skills to answer all the questions related to research and practical problems based on background of mechantronics. Learners will understand how to design and conduct an technical experiment for data collection, analysis and intepretation, which concentrates on the research objectives.	College of Engineering Technology
61	CN516	Mechatronics Project	2	This course is designed for students to register after they have completed courses in electronics and mechatronics system design. This course give students the opportunities to apply previously acquired knowledge in sensors and actuators, electronics, automatic control, mechanical design, etc., to design, manufacture, evaluate the mechatronics system. The project can be carried out by teamwork. Students will have a chance to partly experience a capstone project, in which consideration should be made for multidisciplinary dependence relationships, environment for system implementation, contraints in design, engineering standards, etc.	College of Engineering Technology
62	CN582	Actuators for Mechatronics	3	This course aims to re-systematize devices that perform large energy conversions such as electrodynamic actuators, pneumatic actuators, and hydraulics, Also, the controllers or the control principles of these devices are also mentioned. Thence, the course helps learners not only know the application of existing actuators but also create control methods to increase efficiency in using new or developing actuators.	College of Engineering Technology
63	CN392	CAD, CAM, CNC	3	This course aims to provide principal knowledge of CAD/CAM/CNC, machining on lathes machine and milling machine CNC. Improve advance knowledge of machning on lathes machine and milling machine. This course also improve knowledge about geometry, spatial geometry, coordinate systems in spatial geometry, and specified coordinate axes on a CNC machine. How to write a complete CNC program manually or by CAD/CAM software.	College of Engineering Technology
64	KC387	Internship for Mechatronics Engineering	2	This subject aims for learners who participate working at a company in order to understand more about the basic rules of the company, manufacture procedures, or chains of modern technology systems. From this activity, learners have an opportunity to apply their knowledges from theory into the reallife. Moreover, they can accummulate more conciousness and update information by approaching with equipments and manufacturing systems at the company.	College of Engineering Technology

65	CT397	Computer Measurement and Control	3	This course aims to provide students basic knowledge about the basic communication standard of the computer, measurement circuits and application to surveying and data collection from the sensors. This subject also provides knowldege to design an embedded system, controll and communicate with computer due to the standard communication. This subject also provides knowldege programming the computer connection on the industrial platform such as: modbus, profilebus, ethernet.	College of Engineering Technology
66	CN159	English for Mechatronics	2	This course aims to complement leaners some common grammar structures and new vocabularies in engineering. Moreover, the learners have been provided study methods to have the self-study ability and perceive effectively listening, speaking, and engineering materials' reading comprehension skills. Based on these fundamentals, the learners can conduct a literature review and reading comprehension or make communication on a basic level of specialist fields of study.	College of Engineering Technology
67	XH019	French for Science and Technology	2	Contents of this course aim to accomplish the objective of making communication in science and engineering fields, such as self-introduction (name, age, occupation, education, and so on), introduction on activities and presentation of projects in science and engineering, exchange the specialist letters or e-mails, in that concentrating on specialist engineering vocabularies. Besides, knowledge of the French language and culture is also integrated into the contents of this course.	School of Foreign Languages
68	CN414	Industrial Maintenance Engineering and Management	2	The course provides students with basic knowledge in the work of organizing and managing maintenance; understand the importance and benefits of maintenance; Seeing that the downtime affects the costs, access to modern maintenance solutions (CBM, TPM, CRM,), then choose the right preventive maintenance solution for businesses to maximize equipment availability, minimize costs, and bring OEE to world-class levels.	College of Engineering Technology
69	CT400	Senior Seminar in Control Engineering	2	The course aims to provide the latest scientific knowledge in automation and control by invitation some experts who gives thematic for last year students. These students have to practice a project which improves the knowledge's in reality, the latest science information in control systems and also the working experiences. This course also provides method update the lasted science information, group discussion, writing and presenting science theory.	College of Engineering Technology
70	CN298	Industrial Networks and Communication	2	This course aims to provide students the advanced and continuation of the PLC subject. Introduction of the industrial communication system, the basic component of a communication network and the types of communication network. Searching and using hardware devices and softwares of the popular company. This is the basic knowledge to improve the communication system in the factory.	College of Engineering Technology
71	KC326	IoT Technology and Applications	3	In the trend of upgrading the knowledge and specialist skills of automation and mechatronics engineers, IoT (Internet of things) is a suitable trending field of applying	College of Engineering Technology

				the internet to connect hardware devices via wireless and high-speed connection. This course aims to assist the automation and mechatronic students to experience the schematics, designs, connections, programming, and data acquisition through the web interface that is programmed depending on the ability of each student based on basic applications introduced and guided by the lecturer in class.	
72	CT409	Embedded Programming	3	This course provides basic concepts and knowledge of embedded software technology, introduces the hardware architecture and software architecture; software development environment and the use of supporting tools to program the embedded software for the device; real- time programming; building and using an embedded operating system; the multi-state system; introduction to serial data transmission.	College of Engineering Technology
73	CT384	Artificial Neural Network	3	This course introduces the fundamentals of the artificial neural network and its applications in automatic control. Supervised learning with backpropagation based on Gradient Descent was focused in the course. Various learning algorithms will be introduced and their performance will be compared. Two basic and popular problems of prediction and classification will be focused in the lectures, teamwork assignments, and labs on using Neural Network Toolbox - MATLAB. Recent applications and research on the fields of automatic control, recognition, prediction, estimation will also be introduced in the course so that students have fundamental knowledge and skills to propose their research problems for their final project or thesis.	College of Engineering Technology
74	KC329	Engineering Projects in Community Service – EPICS	2	This course guides students through a group project, by exploring and discovering technical problems in the communities where students live, study and work. These problems will be solved by technical solutions from the students' creativity to remove or lessen the community's pain of the problem. In addition, products are transferred to the community for testing and editing to fix the requirements of the users in the community.	College of Engineering Technology
75	KC365	SCADA (Supervisory Control and Data Acquisition)	3	The course aims to provide learners in the area of Control Engineering and Automation, Mechatronics Engineering about conceptions, structures, components, Human- Machine Interfaces (HMI), alarms and reports of Supervisory Control And Data Acquisition (SCADA) System. Especially, the course focuses on device connection approaches using modern SCADA software. As a result, the learners will be able to perform the experiments to build Supervisory Control And Data Acquisition (SCADA) System.	College of Engineering Technology
76	KC506	Bachelor's Thesis - Mechatronics	14	"Bachelor's Thesis" is to provide students opportunities to design, simulate, analyze, evaluate, develop and manufacture a mechatronics system or a part of a mechatronics system by applying multidisciplinary knowledge, self-learning and acquiring new knowledge as needed and using modern tools. The outcomes of a bachelor's thesis should to meet specified needs with consideration of various factors such as public health,	College of Engineering Technology

				safety, environmental, social, and economic factors. The benefits and impacts of the proposed mechatronics solutions should be judged in global, economic, environmental, and societal contexts. The thesis title can be proposed by the student or by the thesis supervisor so that it is aligned with the professional direction of the students.	
77	KC399	Final Project - Mechatronics	6	This course is to provide students opportunities to design, simulate, analyze, evaluate, develop and manufacture a part of a mechatronics system at a moderate level of complexity (as compared with the Bachelor's thesis) to meet specified needs in various constraints by applying multidisciplinary knowledge, self-learning and acquiring new knowledge as needed and using modern tools. The benefits and impacts of the proposed engineering solutions should be judged in global, economic, environmental, and societal contexts. The project title can be proposed by the student or by the thesis supervisor so that it is aligned with the professional direction of the students.	College of Engineering Technology
78	CT398	Fuzzy Control	2	This course aims to provide learners with knowledge on fuzzy sets and their mathematics; basic fuzzy control techniques; fuzzy control applications and improvements; and real life case studies. In addition, this course also provides and supports practical activities that aim to improve learners' skills on design and simulations the fuzzy control systems for certain applications, and writing reports.	College of Engineering Technology
79	CT376	Industrial Control Electronics	3	This course aims to provide learners with knowledge of industrial sensor devices, principles and designing of semiconductor breaker, learning and using of industrial actuators such as DC motor, AC motor, stepper motor, solenoid industrial measurement devices such as flow, pressure, force Equip for learners with sequential control methods in industry, analysis and design methods for sequential process, random process.	College of Engineering Technology
80	KC378	Application of Wind and Solar Energy	3	This course provides the basics of two of the different renewable energy-based generation technologies and applications: wind and solar. Part 1 provides a general overview of wind power technology and applications, in which the wind turbine classification is described in detail with the basic principles of the wind power system, design aspects, current modeling methods and turbine mechanical system. Part 2 provides in-depth knowledge of solar energy, from the principles of photovoltaic conversion to components in solar power generation systems and related issues.	College of Engineering Technology
81	KC360	Power Conversion Interfaces for Renewable Energy System	3	This project provides students with the knowledge of renewable energy, the requirements to integrate the renewable energy system to power grid, inverter and its controller, and synchronization of PV system and wind power system to power grid. Besides, students are also	College of Engineering Technology

				provided the knowledge of LCL filter in order to stabilize the output current of inverter.	
82	KC345	Modern Control Theory	2	This course aims to provide learners basic knowledges on Mathematics and modern control theory in order to solve adaptive problems. Moreover, learners are taught some methods for analyzing stable criterions and designing modern controllers of the nonlinear systems. Besides that, some estimating algorithms with and without parameters are also given out for learners in cases of solving complex problems.	College of Engineering Technology
83	CN408	Production and OperationsManagement	2	This course provides students with the basic knowledge and specific situations to be solved in the production management process. Specific jobs such as demand forecasting, production planning and scheduling, factory location selection calculation, inventory management and resource planning are introduced as effective approaches to manage the production process.	College of Engineering Technology
84	CN449	Engineering Economy	2	The course provides the necessary technical and economic basics such as: the time value of money, cash flow analysis techniques, depreciation, corporate income tax, estimation and management. cost management in decision making.	College of Engineering Technology

The details of courses are attached in Apendix Section

II.6. Teaching and learning strategies

Teaching and learning methods are carefully selected so that students will be able to accomplish the course learning outcomes which contribute to the achievement of the program learning outcomes and program objectives. Depending on the characteristics of the content and learning outcomes of a course, lecturers apply different teaching methods and design specific learning activities to engage students in learning. Main teaching and learning stategies and their contribution to the achievement of program learning outcomes are tabulated as follows.

Teaching and learning strategiess		PLOs										
		2	3	4	5	6	7	8	9	10	11	12
Interactive learning: presentation, discussion	~	✓	✓	~	✓	✓	~	✓				
Case-study	\checkmark		\checkmark	\checkmark	\checkmark	\checkmark						\checkmark
Independent learning											\checkmark	\checkmark
Lecture-based learning	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark						
Teamwork									\checkmark	\checkmark	\checkmark	
Project-based learning		\checkmark										
Laboratory work								\checkmark			\checkmark	\checkmark
Field study									\checkmark	\checkmark	\checkmark	\checkmark
Research project		\checkmark										

II.7. Assessment methods

- The assessment methods are selected to be suitable with the contents of courses, teaching and learning strategies, and simutanously ensure that they can measure the program learning outcomes expected to be achieved by learners. Two assessment methods are commomly deployed by the lecturers to assess the learners that are regular assessment (continuous assessment during the training program) and semester assessments divided into two times including midterm and final assessments. The primary assessment methods include multiple choices, writing, short test, report, presentation, experimental report, individual exercise, experimental/oral test, thesis/final project presentation.

- To ensure validity, reliability and fairness of student assessment, Department of Automation Technology has designed and utilized many different rubrics for evaluation such as bachelor thesis projects, internship, design and analysis of experiments, mechatronic system design, and microconntroller courses and informed to students in classroom at the beginning of each semester.

- The course grades are followed the 10,0-point scale rounded to one decimal place before converting to letter grading system followed 4,0-point scale under rules of academic works of Can Tho university.

III. STUDY ENVIRONMENT

Can Tho University (CTU), an important state higher education institution in the MD, is the cultural, scientific and technical center of the Mekong Delta (MD) and Vietnam. Since its founding in 1966, CTU has been improving and developing itself. It has an enrollment of about 54.000 undergraduate students; 3.000 students have been following Master programs; and around 300 students are Ph.D candidates. CTU has got over 2.000 staff members including nearly 1.200 teaching staff and 800 supporting staff. From a university with a few fields of study at the beginning, it has developed into a multidisciplinary university. Currently, it has nearly 100 undergraduates, 36 Master and 15 Doctoral training programs. Every year CTU receives students on internship programs from the U.S, Belgium, Japan and so on, or under agreements between their universities and CTU.

CTU's main missions are training, conducting scientific research, and transferring technology to serve the regional and national socio-economic development. In addition to its training responsibilities, CTU has actively taken part in scientific research projects, applying the advances in scientific and technological knowledge to solving problems related to science, technology, economics, culture and society in the region.

The University has established scientific and technological cooperation with many international organizations, universities, and research institutes. As a result of these cooperative projects, the staff's administrative capabilities and specializations have been upgraded. The facilities, experimental equipment, and scientific materials have also been added.

III.1. Infrastructure to support education and research

Total area of CTU is $2,249,773.47 \text{ m}^2$, of which the total construction area for training purposes is nearly double the minimum requirement of the Ministry of Education and Training. Since April 2020, CTU has **290 classrooms** and **lecture halls** with a total area of 61,007.70 m2. The teaching facilities as televisions, projectors, and microphones are fully equipped. All classrooms have televisions or projectors.



Can Tho University Website: <u>https://ctu.edu.vn</u> Fanpage: <u>https://www.facebook.com/CTUDHCT</u>

One of large Faculties of CTU, CoET has 58 laboratories and practice rooms which are distributed and scattered at 9 departments. Besides, the CoET also has several rooms fully equipped for Msc, Ph.D. students, students of high-quality classes, a large hall for special seminars and conferences, and a smaller room for weekly meetings of Department and college leaderships. In addition, CoET has several open, clean and beautiful self-study spaces and free Wi-Fi which can adapt students' self-study and learning activities.



College of Engineering Technology Website: <u>https://cet.ctu.edu.vn</u> Fanpage: https://www.facebook.com/khoacongnghe.ctu

III.2. Library and learning resources

The CTU library includes the learning resources center (LRC) and 14 libraries at colleges and institutes. The construction area of LRC is 7,560 m2 including 23 reading rooms with 1,000 seats. LRC is equipped with fully modern computer rooms, seminar rooms, training rooms, self-learning room, multimedia room which connected to global internet and adapted maximizing the needs of students, providing a professional and comfortable learning and working environment.



Learning Resource Center Website: <u>https://lrc.ctu.edu.vn</u>

The LRC provides a variety of books, textbooks, references in Vietnamese and foreign languages and is regularly updated. As of May 2020, the information resources of the LRC have **62,823 electronic collections**, **139,289 book copies**, and **306,117 books**. The LRC also provides a diversity of **online databases** to serve for learning, teaching, and research demands as described in the below table.

Type of databases	Database name		
Electronic database	Vietnam Law Library, SpingerLink, IEEE, Scopus, etc.		
Open-access online database	Vietnam Online Science Magazine, DSpace @ Cambridge, Elsevier Open Access Journals, etc.		
Domestic and international	MIT47 OpenCoursewave, Coursera, edX, Udemy và		
open materials	FutureLearn		

These materials can be accessed from inside and outside the university. Users can also register online for a library card or directly at the LRC. Besides, to access resources easily, LRC has conducted some tours and guidance courses for students. Consequently, recent survey results show that the satisfaction level of students with the LRC is very high in both resources and services. Specifically, in the most recent survey results, both levels of 'very satisfied' and 'satisfied' are **89.6%**.

Some interesting spaces of LRC are enliested below.



Reading space

Self-study space



Relaxing space

Bookstore



Receptionist space

Cafeteria

CoET's library is directly linked with LRC to provide major material resources served for learning, teaching and research activities for both students and lecturers. It has 16.600 books, 606 papers, and 5.195 bachelor and postgraduate thesis books. Annually, new books and other materials are updated from 9 departments of COET.



CoET's library

III.3. Laboratories

Total number of laboratories, computer practice, experimental camp/stations, workshops and veterinary clinics of CTU is 410, 9 foreign language, multimedia and translation classrooms.

CoET has 58 laboratories, practice rooms, and mechanical workshops. Most the laboratories are the combination of learning-teaching and scientific research activities. Each room has an area of 60-90m2 operated and managed under the clear regulations of CoET and attached on the wall at its inside entrance.

Recently, DAT has updated many modern equipment from industry partners (Emotiv, Siemens, SMC, Rockwell) with the value total of more than \$600,000 as shown in the below table. Those equipment has been utilized for training and research activities to adapt the increasing demand of students and lecturers.

Sponsors	Equiped devices	Fund	Potiental Applications
Emotiv (USA)	05 EEG Equipment	\$34.000	Brain signal exploitation
SMC (Japan)	05 Electro-pneumatic controllers	\$64.000	Study electro-pneumatic circuits, industrial applications
Siemens (Germany)	12 Logic and 06 servo controllers	\$150.000	Study PLC, industrial applications
Rockwell (USA)	01 Factory controller Kit, 40 basic and advance Experiment Kits	\$390.000	Study PLC, industrial applications, factory automation solutions
	Total	\$638.000	

The most modern industrial training kits from Rockwell Automation, USA

Rockwell Automation is a global leader in industrial automation and digital transformation. In 2020, Rockwell Automation has sponsored CTU a complete set of laboratory facilities to assist automation and mechatronic students in their in-depth research of the operation procedure of industrial automation and digital transformation in practice.



Rockwell Automation laboratory facilities



Basic Automation Training Kit

Advanced Automation Training Kit



Small Control System

Medium Control System

Large Control System

Electro-pneumatic training Kits from SMC Japan

SMC Japan is a leading company in developing a broad range of control systems and equipment, such as directional control valves, actuators, and air line equipment, to support diverse applications.

In 2020, SMC has sponsored CTU 05 electro-pneumatic training kits assist automation and mechatronic students on studying variety of electro-pneumatic components, actuators and circuits. Besides, SMC has also promised to permanently suport electro-pneumatic components or actuators for students' projects in future.



Demostrations of pneumatic circuit

Demostrations of electro-pneumatic circuit

Maker innovation space

In April 2019, Innovation Center (Maker Innovation Space) with modern equipment and facilities (3D printers, CNC machine, laser cutter, solar cell energy, electronic device, and robot arm) was established under the sponsorship of USAID (\$105,000) in the Built-IT project to help students and lecturers to develop from their ideas, innovation, fabrication to real products. Innovation Center is located in CICT but managed by CoET. Course projects, bachelor thesis projects, and engineering internship programs are implemented by this center.

Contact: website: https://mis.ctu.edu.vn, fanpage: https://www.facebook.com/MISCTU6789



 $\mathit{Maker innovation space-CTU}$

Follows are some recent events happened in MIS-CTU:

- Welcome the U.S. Ambassador to Vietnam Daniel J. Kritenbrink on November 17, 2020.







- Welcome the General Director of INSEE on November 20, 2020





Welcome the students of Industrial Management Program from CoET to experience the procedures of making a complete product by mechanical tools as 3-D printer, laser machine, etc.



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- Welcome students from NGUYEN HUNG SON High school for jobs orientation.



IV. BUSINESS RELATION

The Center for Students Consultancy, Assistancy and Start-up of CTU regularly organizes the Job Fair to create the link between employers and students. This is a great opportunity for job hunting.

Every year, DAT always invite the companies' representative to joint the Bachelor thesis defense to attract the attention of recruiters and assist them find potential cadidates for their needs.



Recruit information

Showcases from joint companies công ty tnhh công nghệ tanixa



Job interview



Job consultancy

APENDIX 1 OUTLINE OF COURSES