MINISTRY OF EDUCATION AND TRAINING
TAY DO UNIVERSITY

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

TRAINING PROGRAM OF INFORMATION TECHNOLOGY

(Issued together with Decision No: 469/QD-ĐHTĐ August 20, 2021 by Rector of Tay Do University)

A. GENERAL INFORMATION

1. Name of training program (English name):	INFORMATION TECHNOLOGY
2. Degree:	University degree
3. Training codes:	7480201
4. Admission candidates:	Admission evaluation based on high school academic results
5. Training time:	4 years
6. Training form:	Formal
7. Required credits:	150
8. Scale	4 years (12 semesters; 3 semesters/year)
9. Diploma:	Engineer
10. Working position:	IT technician
11. Possibility for further education:	Study for a master's degree in IT

B. TRAINING OBJECTIVE AND LEARNING OUTCOMES

I. Training Objectives

1. General objectives

Training Information Technology engineers with strong professional capacity and proficient vocational skills; have political qualities, patriotism, and love for the profession; have professional ethics, a sense of discipline, a sense of responsibility, a civilized style, and good health to serve the profession and meet the needs of society.

2. Specific objectives

2.1. Knowledge

G1. Equip learners with general knowledge, industry bases, and IT specializations and apply this knowledge to implementing solutions and creating modern IT products that can adapt well to changing needs. new technology.

G2. IT engineers can form professional ideas and develop the ability to manage and operate processes related to their field of expertise.

2.2. Skill

G3. IT engineers meet the requirements for professional skills, career skills, soft skills, and foreign languages to adapt to the working and research environment.
G4. Organize and competently perform professional IT operations, thereby developing creative capacity in the professional field.
G5. Able to work in groups, thereby developing executive capacity, human resource management, and working environment.

2.3. Degree of autonomy and self-responsibility

G6. Training IT engineers with political qualities, professional ethics, and a sense of serving the people, meeting the requirements of building and protecting the Socialist Fatherland.
G7. Able to work independently, self-study, self-research, or continue higher education.

II. Learning outcomes:

1. Knowledge

Output standard	Explain
LO1	Systematically grasp basic knowledge of mathematics, communication, and general law to apply in studying, researching, and working in the field of information technology.
LO2	Understand general educational knowledge about the theory of Marxism-Leninism, Ho Chi Minh's ideology, and national defense education. Understand basic knowledge of basic information technology law and basic English to meet the requirements for acquiring professional educational knowledge
LO3	Apply basic scientific knowledge and advance IT expertise to work, build application software
LO4	Apply knowledge of information systems to design and develop data and information management systems. Database construction and basic database management with advanced orientation
LO5	Apply well advanced knowledge of information technology related to research, development, processing or application of software systems, design, construction and network installation. Operate and

Output standard	Explain
	maintain hardware and software components of computer systems and computer-based equipment systems.
LO6	Planning and managing information technology projects. Analyze and effectively solve problems that arise in database programming for projects and analyze and evaluate algorithm effectiveness

2. Skill

2.1. Job skill

Output standard	Explain
LO7	Collect and process information to solve problems in professional fields; Organize and well-deploy information technology projects, analyze and implement software development processes
LO8	Plan to build solutions and deploy an enterprise network project (including infrastructure and services) according to customer requirements. Analyze, design, and deploy management information systems for small and medium-sized businesses, etc.
LO9	Evaluate the quality and performance of the software; optimize and organize maintenance plans; perform system integration, improvement, and technology transfer, consult on security, technical and technology solutions, information system design, and software development

2.2. Soft skills

Output standard	Explain
LO10	Effectively apply soft skills (communication, teamwork, writing - reading and presenting, presentations...) into real work
LO11	Use foreign languages well at level 3/6 of Vietnam's foreign language competency framework (equivalent to TOEIC ≥ 450 points) in study, research and work

Output standard	Explain
LO12	Adapt and integrate quickly in teamwork, have team leadership skills, assign work, coordinate effectively among members, support other members, exchange among members, and evaluate group member contributions.
LO13	Proficiently apply information technology skills to work, present reports, communicate with people around you, and know how to gather people to work together to solve information technology projects.

2.3. Capacity for autonomy and responsibility

Output standard	Explain
LO14	Respect the law, properly, and fully comply with obligations, regulations, and professional ethics. Eager to learn, and accept challenges of competition in the market
LO15	Organize, coordinate, and manage resources, evaluate goals, and motivate yourself. Take initiative in the working process, orient and adapt to the working environment, and update yourself with new knowledge and skills.
LO16	Guide and supervise others in performing defined tasks and assume personal and group responsibility.
LO17	Humble, honest, objective, and progressive, with a spirit of scientific research and a sense of lifelong learning and career development

2.4. Career orientation and job position of students after graduation

Starting with staff positions, experts in trained professional fields such as: programmers (website, database, artificial intelligence, mobile...), system analysis and design information technology system, network administration, software maintenance, information technology project management, general IT staff, hardware and software management. After meeting the necessary conditions of experience, bravery, and knowledge, students can take on middle management positions and advance to senior levels at businesses specializing in information technology or information technology. Work at banks, schools, hospitals, educational establishments, state agencies, Government and non-Government organizations; or teaching and researching information technology at

universities and colleges. In addition, students can also start their own business after graduation.

2.5. Ability to study and improve qualifications after graduation

- Ability to self-study, improve knowledge and professional skills, maintain and improve soft skills.

- Ability to study other university majors or continue studying at the master's or doctoral level at universities according to regulations of the Ministry of Education and Training.

III. The content of studying program (name and credit for each subject): 150 credits

Total credit		**150**
1	**General knowledge**	**47**
2	**Professional knowledges**	**98**
	- General Knowledge	31
	- Compulsory Knowledge	59
	- Optional knowledge	8
3	**Graduation**	**16**
	- Graduation Internship - Graduation thesis (or do the minor graduated thesis and study 02 alternative subjects)	16

1. General Knowledge: 47 credits

Number	Code	Subject	Credits	Note
1	0301001769	Marxist-Leninist philosophy	3	
2	0301001825	Marxist-Leninist political economy	2	
3	0301001826	Science socialism	2	
4	0301001827	History of the Communist Party of Vietnam	2	
5	0301000665	Ho Chi Minh Thought	2	
6	0301000667	General law	2	
7	0301000670	Calculus A1	3	
8	0301000672	Linear Algebra and Geometry	3	
9	0301001673	Basic informatics	3	

Number	Code	Subject	Credits	Note
10	0301000671	Calculus A2	3	
11	0301000673	Probability statistics	3	
12	0301000946	Toeic-oriented English 1	4	
13	0301000947	Toeic 2 oriented English	4	
14	0301001035	Physical Education 1 - Volleyball*	1	
15	0301001036	Physical Education 1 - Football*		
16	0301001037	Physical Education 1 - Badminton*		
17	0301000660	Physical Education 2 - Volleyball*	1	
18	0301001038	Physical Education 2 - Football*		
19	0301001039	Physical Education 2 - Badminton*		
20	0301001030	Physical Education 3 - Volleyball*	1	
21	0301000661	Physical Education 3 - Football*		
22	0301000662	Physical Education 3 - Badminton*		
23	0301000650	Defense Education*	8	

2. Professional knowledges: 98 credits

Number	Code	Subject	Credits	Note
1. Compulsory Knowledge			**31**	
24	0301000225	Computer architecture	2	
25	0301000574	Discrete Mathematics 1	3	
26	0301000628	Basic programming a	3	
27	0301000024	Data structure	4	
28	0301000395	Algorithm analysis and design	2	
29	0301000575	Discrete math 2	3	
30	0301000164	Operating system	3	
31	0301000277	Object-oriented programming	3	
32	0301000307	Internet	3	

Number	Code	Subject	Credits	Note
33	0301000373	Introduction Software Technology	2	
34	0301000504	Web design and programming	3	
2. Optional Knowledge			**81**	
35	0301000162	Database system	3	
36	0301000279	Communication Programming	3	
37	0301000393	Analysis and design of information systems	3	
38	0301000541	Professional English - IT	3	
39	0301000556	Mobile device programming	3	
40	0301000400	Law specialized in IT	2	
41	0301000434	Informatics project management	2	
42	0301000581	Artificial intelligence	3	
43	0301001322	Microsoft Windows network administration	2	
44	0301000391	Object-oriented system analysis	3	
45	0301000645	Image processing	3	
46	0301001585	Methods of researching and writing scientific - IT reports	2	
47	0301000049	Programming language topics	2	
48	0301002576	Data mining	2	
49	0301002619	Principles of machine learning	4	
50	0301002617	Web Technology	3	
51	0301002022	Embedded programming and IoT	3	
52	0301002618	Software Development	4	
53	0301002248	Yearbook 1 - IT	3	
54	0301002249	Yearbook 2 - IT	3	
55	0301002250	Yearbook 3 - IT	3	
56	0301002251	Graduate internship - IT	6	

3. Graduation: 16 credits

Number	Code	Subject	Credits	Note
1. Graduation Internship:				
57	0301001589	IT graduation essay	6	
2. Graduation thesis:				
58	0301001588	IT graduation thesis	10	

4. Additional, optional, in-depth knowledge of the industry

No	Course code	Course name	Number of Credits		
			Total	Theory	Practice
59	0301000464	Linear planning – IT	2	2	0

No	Course code	Course name	Number of Credits		
			Total	Theory	Practice
60	0301000303	Information theory		2	0
61	0301000425	Calculation method - IT		2	0
62	0301000319	Simulation	2	2	0
63	0301000304	Queuing theory		2	0
64	0301001323	Topic on a database management system 1	2	1	1
65	0301001324	Topic on a database management system 2		1	1
66	0301000536	E-commerce - IT		2	0
67	0301000406	Open source software development	2	1	1
68	0301000156	Robot interface		2	0
69	0301000017	Distributed systems		2	0
70	0301000165	Real-time control system		2	0
71	0301000501	Design network settings	4	1	1
72	0301000004	Information safety and security		1	1
73	0301002620	System safety and network security		1	1
74	0301000758	Embedded System		1	1
75	0301000564	Grid calculation		1	1
76	0301001579	Theoretical informatics	4	2	0
77	0301000045	Translation program		2	0
78	0301000646	Natural language processing		2	0
79	0301000163	Knowledge base system		2	0
80	0301000496	Computer vision	4	1	1
81	0301000050	Web programming language topic		1	1
82	0301000759	Multi-Agent System		1	1
TOTAL			**8**	**6-7**	**2-1**

TEACHING PLAN: (expected 2 semesters/year)

Semester 1

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301002397	Basic programming	3	2	1	60	30	30
2	0301000672	Linear Algebra and Geometry	3	3	0	45	45	0
3	0301000667	General law	2	2	0	30	30	0
4	0301000670	Calculus A1	3	3	0	45	45	0
5	0301000679	Basic informatics	3	0	3	90	0	90
6	0301001035	Physical Education 1 - Volleyball*	1	0	1	30	0	30
7	0301001036	Physical Education 1 - Football*		0	1		0	30

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
8	0301001037	Physical Education 1 - Badminton*		0	1		0	30
Total:			**15**	**10**	**5**	**300**	**150**	**150**

Semester: 2

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301001769	Marxist-Leninist philosophy	3	3	0	45	45	0
2	0301000671	Calculus A2	3	3	0	45	45	0
3	0301000946	Toeic-oriented English 1	4	4	0	60	60	0
4	0301000574	Discrete MaPracticeematics 1	3	3	0	45	45	0
5	0301000660	Physical Education 2 - Volleyball*	1	0	1	30	0	30
6	0301001038	Physical Education 2 - Football*		0	1		0	30
7	0301001039	Physical Education 2 - Badminton*		0	1		0	30
Total:			**14**	**13**	**1**	**225**	**195**	**30**

Semester: 3

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301001825	Marxist-Leninist political economy	2	2	0	30	30	0
2	0301000947	Toeic 2 oriented English	4	4	0	60	60	0
3	0301000650	Defense and security education*	8	8	0	120	120	0
Total:			**14**	**14**	**0**	**210**	**210**	**0**

Semester: 4

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301000225	Computer architecture	2	2	0	30	30	0
2	0301000673	Statistical Probability (Economics and Engineering)	3	3	0	45	45	0
3	0301001826	Science socialism	2	2	0	30	30	0
4	0301000024	Data structure	4	3	1	75	45	30
5	0301001030	Physical Education 3 - Volleyball*	1	0	1	30	0	30

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
6	0301000661	Physical Education 3 - Football*		0	1		0	30
7	0301000650	Physical Education 3 - Badminton*		0	1		0	30
Total:			**12**	**10**	**2**	**210**	**150**	**60**

Semester: 5

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301001827	History of Practicee Communist Party of Vietnam	2	2	0	30	30	0
2	0301000164	Operating system	3	2	1	60	30	30
3	0301000162	Database system	3	2	1	60	30	30
4	0301000395	AlgoriPracticem analysis and design	2	2	0	30	30	0
5	0301000277	Object-oriented programming	3	2	1	60	30	30
Total:			**13**	**10**	**3**	**240**	**150**	**90**

Semester: 6

No	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301000575	Discrete maPractice 2	3	3	0	45	45	0
2	0301000307	Internet	3	2	1	60	30	30
3	0301000665	Ho Chi Minh Practiceought	2	2	0	30	30	0
4	0301000504	Web design and programming	3	2	1	60	30	30
Elective courses (choose at least 2 courses)								
5	0301000464	Linear planning – IT	2	2	0	30	30	0
6	0301000303	Information Theory		2	0		30	0
7	0301000425	Calculation mePracticeod - IT		2	0		30	0
Total:			**13**	**11**	**2**	**225**	**165**	**60**

Semester: 7

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301000400	Law specialized in IT	2	2	0	30	30	0

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
2	0301001585	MePracticeods of researching and writing scientific - IT reports	2	2	0	30	30	0
3	0301000393	Analysis and design of information systems	3	2	1	60	30	30
4	0301000373	Introduction Software Technology	2	2	0	30	30	0
5	0301002248	Yearbook 1 - IT	3	0	3	90	0	90
Elective courses (choose at least 2 courses)								
6	0301000304	Queuing Theory	2	2	0	30	30	0
7	0301000319	Simulation		2	0		30	0
Total:			**14**	**10**	**4**	**270**	**150**	**120**

Semester: 8

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301000581	Artificial intelligence	3	3	0	45	45	0
2	0301002619	Machine learning	4	2	2	90	30	60
3	0301000049	Programming language topics	2	1	1	45	15	30
4	0301002249	Yearbook 2 - IT	3	0	3	90	0	90
Total:			**12**	**6**	**6**	**270**	**90**	**180**

Semester: 9

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301001322	Microsoft Windows network administration	2	1	1	45	15	30
2	0301000556	Mobile device programming	3	1	2	75	15	60
3	0301000391	Object-oriented system analysis	3	2	1	60	30	30
4	0301002250	Yearbook 3 - IT	3	0	3	90	0	90
Elective courses (choose at least 2 courses)								
5	0301001323	Topic on a database management system 1	2	1	1	45	15	30
6	0301001324	Topic on a database management system 2		1	1		15	30
Total:			**13**	**5**	**8**	**315**	**75**	**240**

Semester: 10

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301000541	Professional English - IT	3	3	0	45	45	0
2	0301000434	Informatics project management	2	2	0	30	30	0
3	0301000645	Image processing	3	2	1	60	30	30
4	0301002576	Data mining	2	1	1	45	15	30
5	0301002617	Web Technology	3	2	1	60	30	30
Total:			**13**	**10**	**3**	**240**	**150**	**90**

Semester: 11

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301000279	Communication Programming	3	2	1	60	30	30
2	0301002022	Embedded programming and IoT	3	2	1	60	30	30
3	0301002618	Software Development	4	2	2	90	30	60
Elective courses (choose at least 2 courses)								
4	0301000536	E-commerce - IT	2	2	0	30	30	0
5	0301000406	Open-source software development		1	1	45	15	30
6	0301000156	Robot interface		2	0	30	30	0
Total:			**12**	**7–8**	**5–4**	**240–255**	**105–120**	**120–150**

Semester: 12

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
1	0301002251	Practical internship - IT	6	0	6	270	0	270
Group of students working on graduation Practiceesis								
2	0301001588	IT graduation Practiceesis	10	0	10	300	0	300
Group of students writing Graduation Essays (additional elective courses)								
3	0301001589	IT graduation essay	6	0	6	180	0	180
Additional elective courses (choose 1 of 3 groups, each group chooses 4 credits)								
Group 1								
4	0301000017	Distributed systems	4	2	0	30	30	0
5	0301000165	Real-time control system		2	0	30	30	0
6	0301000501	Design network settings		1	1	45	15	30
7	0301000004	Information safety and security		1	1	45	15	30

STT	Subject code	Subject title	Number of credits			Number of periods		
			Total	Theory	Practice	Total	Theory	Practice
8	0301002620	System safety and network security		1	1	45	15	30
Group 2								
9	0301000758	Embedded System	4	1	1	45	15	30
10	0301000564	Grid calculation		2	0	30	30	0
11	0301001579	Practiceeoretical informatics		2	0	30	30	0
12	0301000045	Translation program		2	0	30	30	0
13	0301000646	Natural language processing		2	0	30	30	0
Group 3								
14	0301000163	Knowledge base system	4	2	0	30	30	0
15	0301000496	Computer vision		1	1	45	15	30
16	0301000050	Web programming language topic		1	1	45	15	30
17	0301000759	MuTheoryi-Agent System		1	1	45	15	30
Total:			**16**	**0-4**	**12- 16**	**510-570**	**0-60**	**450-570**