Training major: INFORMATION TECHNOLOGY

1. **Awarding institution:** HCMC University of Technology and Education

2. **Details of the accreditation by a professional or statutory body**: Based on regulations issued by decision No. 17/VBHN-BGDĐT

3. **Name of the final award:** Bachelor of Engineering in Information Technology.

4. **Programme Title:** Bachelor of Engineering in Information Technology.

5. **Mode of delivery:** Full time.

6. **Designed training time:** 4 years.

7. **Admission criteria or requirements to the programme:**

   Applicants must graduate from high school education and fulfil school-wide and program-specific admission criteria publicly published by UTE every year.

8. **Programme goals:**

   To train Information Technology (IT) engineers with basic scientific knowledge, fundamental and specialized IT knowledge, ability to analyze, evaluate and select appropriate solutions to build and manage IT systems, ethics and appropriate professional attitudes, communication skills and teamwork, and life-long learning capability to meet the development needs of society.

9. **Programme objectives:**

After completing the program, students will have:

Code	PLO	Objectives
1	1	Apply general knowledge in social sciences, natural sciences and Information Technology (IT)
2	2	Develop knowledge discovery, problem-solving, system-thinking skills and professional skills in the field of IT
3	3	Demonstrate effective teamwork and communication skills
4	4	Conceive, design, implement and operate IT systems, together with leadership and engineering entrepreneurship knowledge

PLO = Program learning outcomes

10. **Expected learning outcomes of the programme**

    After successfully completing the IT programme, students will be able to:

Code	ELOs	Program Outcomes	Rating Scale
1		General knowledge in social sciences, natural sciences and Information Technology (IT)	
1.1	1	Apply general knowledge in social and natural sciences into the field of IT	3

1.2	2	Apply fundamental knowledge into the field of IT	3
1.3	3	Apply specialized knowledge into the field of IT, especially networking and network security, information systems, and software engineering	3
2		Personal and professional skills	
2.1	4	Identify, analyze and solve problems in the IT field	4
2.2	5	Deconstruct and perform experiments on IT problems	4
2.3	6	Analyze IT problems using system thinking skill	4
2.4	7	Demonstrate personal attitudes and skills, such as self-confidence, enthusiasm, creative thinking, critical thinking, lifelong learning and time management	3
2.5	8	Demonstrate professional attitudes and skills, such as ethics, professional behavior and proactive vision	3
3		Teamwork and communication skills	
3.1	9	Work effectively in a group	4
3.2	10	Communicate effectively in various forms, such as writing, graphics and presentation	5
3.3	11	Demonstrate the ability to use technical English in the field of IT	3
4		CDIO skills and attitudes (conceive, design, implement, operate) and knowledge about leadership and entrepreneurship	
4.1	12	Recognize the roles and responsibility of IT engineers in societal context	5
4.2	13	Conform to different enterprise cultures	3
4.3	14	Conceive ideas for computer networks, software and information systems	6
4.4	15	Design computer networks, software and information systems	6

4.5	16	Implement hardware and/or software for IT systems	5
4.6	17	Operate and maintain IT systems	5
		Additional Program Outcomes: Leadership and technical entrepreneurship	
4.7	18	Demonstrate leadership in technical IT problems	3
4.8	19	Illustrate startup and technical entrepreneurship knowledge in the IT field	2

11. **Course workload (Credits):** 132 credits (Not including physical training, national defense and security courses)

12. **Teaching and learning methods:** Students are encouraged to build their own understanding of the world by investigating and experiencing on their own under the coaching of instructors. The institution appreciates the core values of life-long learning by providing students with opportunities for a comprehensive development of cognitive, social and behavioural competencies. Through the learning process, individuals are stimulated to explore themselves and take the learning activities as a tool to fulfil their own aspirations and to serve the community.

13. **Student assessment methods:** Student assessment in each course includes formative assessment and summative assessment with the weight distribution is divided equally, 50% for formative and 50% for summative assessment. The formative assessment is performed many times during the course using many different methods. The summative assessment is normally executed at the end of the course to evaluate students' abilities to achieve course learning outcomes (CLOs). Various types of assessment such as oral presentations, exercises, quizzes, paper-based tests, practice tests, presentation, and course projects have been applied.

14. **Program Structure**

No	Course Title	Credits
	General Knowledge	**46**
	A. Required Courses	**36**
I. Law and Politics		**12**
1	The Basic Principles of Marxist Leninism	5
2	Revolution of Vietnamese Communist Party	3
3	Ho Chi Minh's Ideology	2
4	General Law	2
II. Mathematics and Natural Sciences		**21**
1	Calculus 1	3
2	Calculus 2	3
3	Linear Algebra and Algebraic Structures	4

4	Mathematical Statistics for Engineers		3
5	Physics 1		3
6	Physics - Laboratory 1		1
7	Electrical Electronic Engineering		3
8	Basic Electronic Practice		1
III. Introduction to Information Technology			**3** (2+1)
B. Elective Courses			**10**
IV. IT			**6**
1	Introduction to Programming		3(2+1)
2	Programming Techniques		3(2+1)
V. Social Sciences			**4**
1	General Economics		2
2	Introduction to Quality Management		2
3	Introduction to Management		2
4	Introduction to Logic		2
5	Introduction to Vietnamese Culture		2
6	Introductory Sociology		2
7	Psychology for Engineers		2
8	Systems Thinking		2
9	Learning Skills		2
10	Planning Skill		2
11	Workplace Skills		2
12	Research Method		2
C. Physical Training, National Defense and Security Courses			
VIII. Physical Training			
1	Physical Training 1		1
2	Physical Training 2		1
3	Physical Training 3		3
IX. National Defense and Security			165 hours
PROFESSIONAL KNOWLEDGE AND SKILLS			**86**
IT-related fundamental			
Fundamental			**75**
Specialized			
Internship			**2**
Enterprise Subject			**2**
Leadership and Technical Entrepreneurship			**0**
Capstone Project			**7**

Program Content

A. Required courses

A1. General Knowledge

No.	Course Code	Course Title	Credits	Prerequisites
1.	LLCT150105	The Basic Principles of Marxist Leninism	5	
2.	LLCT120314	Ho Chi Minh's Ideology	2	
3.	LLCT230214	Revolution of Vietnamese Communist Party	3	
4.	GELA220405	General Law	2	
5.	MATH132401	Calculus 1	3	
6.	MATH132501	Calculus 2	3	
7.	MATH143001	Linear Algebra and Algebraic Structures	4	
8.	MATH132901	Mathematical Statistics for Engineers	3	
9.	PHYS130902	Physics 1	3	
10.	PHYS 111202	Physics - Laboratory 1	1	
11.	EEEN234162	Electrical Electronic Engineering	3	
12.	PRBE214262	Basic Electronic Practice	1	
13.	INIT130185	Introduction to IT	3(2+1)	
14.	INPR130285	Introduction to Programming	3(2+1)	
15.	PRTE230385	Programming Techniques	3(2+1)	
16.	PHED110513	Physical Training 1	1	
17.	PHED110613	Physical Training 2	1	
18.	PHED130715	*Physical Training 3*	3	
19.	GDQP008031	National Defense and Security	165 hours	
Total			**42**	

A2. Professional Knowledge and skills

- IT-related fundamental knowledge and skills

No.	Course Code	Course Title	Credits	Prerequisites
1.	DIGR230485	Discrete Mathematics and Graph Theory	3(2+1)	INPR130285
2.	DASA230179	Data Structures and Algorithms	3(2+1)	PRTE230385
3.	OOPR230279	Object-Oriented Programming	3(2+1)	INPR140285, PRTE240385
4.	WIPR230579	Windows Programming	3(2+1)	PRTE230385, OOPR230279
5.	INSE330380	Information Security	3(2+1)	INPR130285, NEES330380, DBSY230184
6.	WEPR330479	Web Programming	3(2+1)	PRTE230385, DASA230179, DBSY230184, OOPR230279
7.	SOEN330679	Software Engineering	3(2+1)	DBSY230184, DASA230179, INPR130285,

No.	Course Code	Course Title	Credits	Prerequisites
				PRTE230385, OOPR230279
8.	CAAL230180	Computer Architecture and Assembly Language	3(2+1)	EEEN234162
9.	OPSY330280	Operating Systems	3(2+1)	CAAL230180, PRTE230385
10.	NEES330380	Networking Essentials	3(2+1)	
11.	DBSY230184	Database Systems	3(2+1)	PRTE230385, DASA230179
12.	DBMS330284	Database Management Systems	3(2+1)	DBSY230184, WIPR230579
13.	ARIN330585	Introduction to Artificial Intelligence	3(2+1)	DIGR130485, PRTE130385, DASA230179
		Total	**39**	

- Specialized knowledge and skills

No.	Course Code	Course Title	Credits	Prerequisites
Software Engineering (SE)				
1.	WESE331479	Web Security	3(2+1)	INSE330380, NEES330380, WEPR330479
2.	OOSD330879	Object Oriented Software Design	3(2+1)	OOPR230279
3.	MOPR331279	Mobile Programming	3(2+1)	DASA230179, PRTE230385, DBSY230184, OOPR230279
4.	SOTE431079	Software Testing	3(2+1)	SOEN33067, DBSY230184
5.	MTSE431179	Modern Software Technologies	3(2+1)	WEPR330479, SOEN330679
6.	POSE431479	Project on Software Engineering	3	
		Total	**18**	
Computer Network and Network Security (CNNS)				
1.	INSE331980	Cryptography	3(2+1)	MATH143001, PRTE230385, DASA230179
2.	ADNT330580	Advanced Network Technologies	3(2+1)	NEES330380
3.	ETHA332080	Ethical Hacking and Defense	3(2+1)	INPR130285, NEES330380, INSE330380
4.	CNDE430780	Computer Networks Design	3(2+1)	ADNT330580
5.	NSEC430880	Networks Security	3(2+1)	NEES330380
6.	POCN431280	Project on Computer Network and Network Security	3	
		Total	**18**	
Information Systems (IS)				
7.	ISAD330384	Information Systems Analysis and Design	3(2+1)	DBMS330284
8.	DAMI330484	Data Mining	3(2+1)	DBSY240184
9.	ADDB331784	Advanced Database Systems	3(2+1)	DBSY230184

No.	Course Code	Course Title	Credits	Prerequisites
10.	BDES333877	Big Data Essentials	3(2+1)	
11.	DBSE431284	Database Security	3(2+1)	DBSY230184, DBMS330284, INSE330380
12.	POIS431184	Project on Information Systems	3	
		Total	**18**	

A3. Graduation (*Students select one of following options*)

No.	Course Code	Course Title	Credits	Prerequisites
1.	GRPR471979	Capstone project	7	**Pass Qualified exam**
2.	Or complete the following courses			
3.	SPSU432579	Specialized Subject 1	3(2+1)	
4.	SPSU422084	Specialized Subject 2	2(1+1)	
5.	SPSU421780	Specialized Subject 3	2(1+1)	
Total				

B – Elective courses:

B1. General Knowledge

No.	Course Code	Course Title	Credits	Prerequisites
1.	GEFC220105	General Economics	2	
2.	IQMA220205	Introduction to Quality Management	2	
3.	INMA220305	Introduction to Management	2	
4.	INLO220405	Introduction to Logic	2	
5.	IVNC320905	Introduction to Vietnamese Culture	2	
6.	INSO321005	Introductory Sociology	2	
7.	ENPS220591	Psychology for Engineers	2	
8.	SYTH220491	Systems Thinking	2	
9.	LESK120190	Learning Skills	2	
10.	PLSK120290	Planning Skill	2	
11.	WOPS120390	Workplace Skills	2	
12.	REME320690	Research Method	2	

B.2 Professional knowledge and skills (Students choose 4 among the following)

No.	Course Code	Course Title	Credits	Prerequisites
1.	DIPR430685	Digital Image Processing	3(2+1)	DIGR130485, PRTE130385, DASA230179
2.	ADPL331379	Advanced Programming Language	3(2+1)	
3.	ESYS431080	Embedded Systems	3(2+1)	EEEN234162, CAAL230180, OPSY330280
4.	FOIT331380	Fundamental of Information Theory	3(2+1)	MATH132401, MATH132501, MATH132901
5.	ECOM430984	Electronic Commerce	3(2+1)	WEPR330479

No.	Course Code	Course Title	Credits	Prerequisites
6.	CLCO332779	Cloud Computing	3(2+1)	PRTE230385, DASA230179, DBSY230184, OOPR230279
7.	MALE431984	Machine Learning	3(2+1)	PRTE230385
8.	DLEA432085	Deep Learning	3(2+1)	

B3. Specialized courses (Students choose 2 courses suitable with their concentration from the followings)

No.	Course Code	Course Title	Credits	Prerequisites
1.	TOEN430979	Software Development Environments and Tools	3(2+1)	SOEN330679, OOPR230279
2.	SEEN431579	Search Engine	3(2+1)	
3.	SOPM431679	Software Project Management	3(2+1)	SOEN330679
4.	ADMP431879	Advanced Mobile Programming	3(2+1)	MOPR331279, DBSY230184
5.	ESDN432079	Educational Software Design	3(2+1)	SOEN330679
6.	BDAN333977	Big Data Analysis	3(2+1)	DAMI330484
7.	DAWH430784	Data Warehouse	3(2+1)	DBSY240184
8.	INRE431084	Information Retrieval	3(2+1)	DBSY240184
9.	DIFO432180	Digital Forensics	3(2+1)	INSE330380, NEES330380
10.	NSMS432280	Network Security Monitoring Systems	3(2+1)	NEES330380
11.	WISE432380	Wireless and Mobile Network Security	3(2+1)	NEES330380, INSE330380
12.	CLAD432480	Cloud Environment Administration	3(2+1)	NEES330380

C. Cross-Discipline Courses

No.	Course Code	Course Title	Credits	Prerequisites
1.	DIGI330163	Digital Systems	3(2+1)	
2.	DSIC330563	Digital Systems Design with HDLs	3(2+1)	
3.	BIIM330865	Biomedical Image Processing	3(2+1)	
4.	BIME331965	Model Design on Computer	3(2+1)	
5.	APME332565	Collection and Control of Equipment with Computer	3(2+1)	
6.	DSPR431264	Digital Signal Processing	3(2+1)	

D. Massive Open Online Courses

In order to facilitate access to advanced training programs, students can take the following online courses instead of their equivalences in the program:

No	Course Code	Course Title	Credit	MOOC (URL)

1.	DIPR330685	Digital Image Processing	3	Fundamentals of Digital Image and Video Processing https://www.coursera.org/learn/digital
2.	MALE431984	Machine Learning	3	Coursera, https://www.coursera.org/learn/machine-learning
3.	BDES233877	Big Data Essentials	3	Coursera, https://www.coursera.org/learn/big-data-essentials
4.	INSE330380	Information Security	3	https://classroom.udacity.com/courses/ud459

15. Teaching Plan

1st Semester

No.	Course Code	Course Title	Credits	Prerequisites
1.	MATH132401	Calculus 1	3	
2.	MATH143001	Linear Algebra and Algebraic Structures	4	
3.	INIT130185	Introduction to IT	3(2+1)	
4.	INPR130285	Introduction to Programming	3(2+1)	
5.	PHYS130902	Physics 1	3	
6.	GELA220405	General Law	2	
7.	PHED110513	Physical Training 1	1	
		Total	**19**	

2nd Semester

No	Course Code	Course Title	Credits	Prerequisites
1.	MATH132501	Calculus 2	3	
2.	MATH132901	Mathematical Statistics for Engineers	3	
3.	PRTE230385	Programming Techniques	3(2+1)	
4.	PHYS 111202	Physics Lab 1	1	
5.	EEEN234162	Electrical Electronic Engineering	3	
6.	DIGR230485	Discrete Mathematics and Graph Theory	3(2+1)	
		Total	**16**	

3rd Semester

No	Course Code	Course Title	Credits	Prerequisites
1.	PRBE214262	Basic Electronic Practice	1	
2.	DASA230179	Data Structures and Algorithms	3(2+1)	
3.	OOPR230279	Object-Oriented Programming	3(2+1)	
4.	CAAL230180	Computer Architecture and Assembly Language	3(2+1)	
5.		General Knowledge Elective 1	2	
6.		General Knowledge Elective 2	2	
	List of general knowledge elective courses:			
1.	GEFC220105	General Economics	2	
2.	IQMA220205	Introduction to Quality Management	2	
3.	INMA220305	Introduction to Management	2	
4.	INLO220405	Introduction to Logic	2	
5.	IVNC320905	Introduction to Vietnamese Culture	2	

No	Course Code	Course Title	Credits	Prerequisites
6.	INSO321005	Introductory Sociology	2	
7.	ENPS220591	Psychology for Engineers	2	
8.	SYTH220491	System Thinking	2	
9.	LESK120190	Learning Skills	2	
10.	PLSK120290	Planning Skill	2	
11.	WOPS120390	Workplace Skills	2	
12.	REME320690	Research Method	2	
		Total	**14**	

4ᵗʰ Semester

No	Course Code	Course Title	Credits	Prerequisites
1.	WIPR230579	Windows Programming	3(2+1)	
2.	NEES330380	Networking Essentials	3(2+1)	
3.	OPSY330280	Operating Systems	3(2+1)	
4.	DBSY230184	Database Systems	3(2+1)	
5.	ARIN330585	Introduction to Artificial Intelligence	3(2+1)	
		Total	**15**	

5ᵗʰ Semester

No	Course Code	Course Title	Credits	Prerequisites
1.	INSE330380	Information Security	3(2+1)	
2.	WEPR330479	Web Programming	3(2+1)	
3.	SOEN330679	Software Engineering	3(2+1)	
4.	DBMS330284	Database Management Systems	3(2+1)	
5.	*Fundamental Elective 1 – Students choose one from the following:*			
6.	CLCO332779	Cloud Computing	3(2+1)	
7.	ADPL331379	Advanced Programming Language	3(2+1)	
8.	*Fundamental Elective 2 – Students choose one from the following:*			
9.	MALE431984	Machine Learning	3(2+1)	
10.	ECOM430984	Electronic Commerce	3(2+1)	
		Total	**18**	

6ᵗʰ Semester

No	Course Code	Course Title	Credits	Prerequisites
1.	*Fundamental Elective 3 – Students choose one from the following:*			
2.	DIPR430685	Digital Image Processing	3(2+1)	
3.	DLEA432085	Deep Learning	3(2+1)	
4.	*Fundamental Elective 4 – Students choose one from the following:*			
5.	ESYS431080	Embedded Systems	3(2+1)	
6.	FOIT331380	Fundamental of Information Theory	3(2+1)	
Software Engineering				
7.	WESE331479	Web Security	3(2+1)	
8.	OOSD330879	Object Oriented Software Design	3(2+1)	
9.	MOPR331279	Mobile Programming	3(2+1)	
Computer Network & Network Security				
10.	INSE331980	Cryptography	3(2+1)	
11.	ADNT330580	Advanced Network Technologies	3(2+1)	
12.	ETHA332080	Ethical Hacking and Defense	3(2+1)	

No	Course Code	Course Title	Credits	Prerequisites
Information Systems				
13.	ISAD330384	Information Systems Analysis and Design	3(2+1)	
14.	DAMI330484	Data Mining	3(2+1)	
15.	BDAN333877	Big Data Essentials	3(2+1)	
Elective Courses				
16.		*Specialized Elective 1*	3(2+1)	
Students choose one from the following depend on their major				
Software Engineering				
17.	TOEN430979	Software Development Environments and Tools	3(2+1)	
18.	SEEN431579	Search Engine	3(2+1)	
19.	SOPM431679	Software Project Management	3(2+1)	
Computer Network & Network Security				
20.	DIFO432180	Digital Forensics	3(2+1)	
21.	NSMS432280	Network Security Monitoring Systems	3(2+1)	
Information Systems				
22.	ADDB331784	Advanced Database Systems	3(2+1)	
23.	DAWH430784	Data Warehouse	3(2+1)	
Total			**18**	

7th Semester

No	Course Code	Course Title	Credits	Prerequisites
1.	ITIN421085	IT Enterprise Internship	2	
2.	ITEN420885	IT Enterprise Subject	2	
3.	ITLE420985	IT Leadership and Entrepreneurship	0	
Software Engineering				
4.	SOTE431079	Software Testing	3(2+1)	
5.	MTSE431179	Modern Software Technologies	3(2+1)	
6.	POSE431479	Project on Software Engineering	3	
Computer Network & Network Security				
7.	CNDE430780	Computer Network Design	3(2+1)	
8.	NSEC430880	Network Security	3(2+1)	
9.	POCN431280	Project on Computer Network & Network Security	3	
Information Systems				
10.	BDES333977	Big data analysis	3(2+1)	
11.	DBSE431284	Database Security	3(2+1)	
12.	POIS431184	Project on Information Systems	3	
Total			**9**	

8th Semester

No	Course Code	Course Title	Credits	Prerequisites
Elective Courses				
1.		*Specialized Elective 2*	3(2+1)	
Students choose one from the following depend on their major or one of the cross-discipline courses				
Software Engineering				
2.	ADMP431879	Advanced Mobile Programming	3(2+1)	
3.	ESDN432079	Educational Software Design	3(2+1)	
Computer Network & Network Security				

4.	WISE432380	Wireless and Mobile Network Security	3(2+1)	
5.	CLAD432480	Cloud Environment Administration	3(2+1)	
Information Systems				
6.	INRE431084	Information Retrieval	3(2+1)	
7.	SEEN431579	Search Engine	3(2+1)	
Graduation				
8.	GRPR471979	Capstone project	7	**Pass The Qualified Exam**
Or take the following courses				
9.	SPSU432579	Specialized Subject 1	3(2+1)	
10.	SPSU422084	Specialized Subject 2	2(1+1)	
11.	SPSU421780	Specialized Subject 3	2(1+1)	
Total			**10**	

16. Job and Post-graduate study opportunities:

IT graduates can work in domestic and international software companies, network solution providers, information systems solution providers and other IT firms. Graduates can also work in non-IT companies that apply IT in operations, management and production. In addition, graduates can participate in research and teaching at research institutes, universities, as well as professional secondary schools. Pursuing higher education, such as the Master and PhD degrees in IT-related fields, e.g., computer science and computer engineering, is also a good choice for students who graduate with distinction.

17. Date on which the programme specification was written or revised: written in 2001 and reviewed in 2004, 2008, 2012, 2018.

18. Programme contact:

Dr. Le Van Vinh - Vice Dean

Email: vinhlv@hcmute.edu.vn

Phone number: 0915755166

Mailing address: 01 Vo Van Ngan, Thu Duc District, HCMC, VN

19. Campus Infrastructure

Follow the Ministry of education and training's regulations

19.1 Workshops and Laboratories

The faculty now has 9 computer rooms with about 400 computers; a network and data transmission laboratory with modern equipment from Cisco, O2 Micro; and 3 other laboratories for Software Engineering, Information Systems, and Mobile Programming.

19.2 Library, Website

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

RECTOR   **DEAN OF FACULTY**