

School of Computer Science and Engineering International University Vietnam National University, Ho Chi Minh City

Student Handbook 2017 – 2018

Computer Science

Network Engineering



This handbook contains all administrative and practical processes operated in the School of Computer Science and Engineering exclusively. Students need this handbook to study and participate in activities effectively.

The programs and services provided in this handbook are as of September 2017. The academic policies are subject to review and evaluation, the School of Computer Science and Engineering reserves the right to make changes at any time.

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Table of Contents

1.	Intr	oduction5					
2.	Pro	Program Mission6					
3.	Pro	Program Outcomes6					
4.	Job	Opportunities					
5.	Aca	demic Program8					
6.	Pro	gram Objectives9					
7.	Acc	reditation9					
8.	Adr	mission Criteria of the Program9					
9.	Ber	nchmarking10					
10.	Теа	ching, Learning Strategies10					
11.	Stu	dent Assessment					
12.	Pro	gram Structure and Requirements including Levels, Modules, and Credits 11					
12	.1.	Distribution of academic curriculum	11				
12	.2.	Program structure and content	12				
12	.3.	Curriculum description	13				
13.	IU F	Program					
13	.1.	IU CS curriculum – TOEFL ≥ 500 (4 Years)	19				
13	.2.	IU NE curriculum – TOEFL ≥ 500 (4 Years)	21				
14.	Twi	ining Program23					
14	.1.	SCSE – IU – Twining program with Nottingham University - TOEFL \ge 500	23				
14	.2.	SCSE – IU – Twining program with West of England University - TOEFL \ge 500	23				
14	.3.	SCSE – IU – Twining program with Rutgers University - TOEFL \ge 500	24				
14	.4.	SCSE – IU – Twining program with SUNY Binghamton University - TOEFL \ge 500	25				
15.	Ma	trix Course & Learning Outcomes26					
16.	Cou	Irse Description					
17.	Aca	demic Regulation					

17.1.	Specialization selection	39
17.2.	Summer internship registration	39
17.3.	Thesis registration	39
17.4.	Graduation criteria	39
17.5.	Scholarship information	39
17.6.	Course registration	40
17.7.	Academic suspension	40
17.8.	Academic information	41
17.9.	Grading criteria	41
18. Fac	ulty	41
19. Deg	gree Checklist	48
19.1.	Computer science program	48
19.2.	Network engineering program	49

1. Introduction

The document provides an overview of the undergraduate programs at School of Computer Science and Engineering (SCSE) International University, Vietnam National University in Ho Chi Minh City. It includes mission, course list, curriculum roadmap, course description, IU and twinning programs, job opportunities, educational objectives, program outcomes, curriculum description.

The School of Computer Science and Engineering (SCSE) is one of the first four schools in the International University. With modern facilities and innovative programs, SCSE becomes a highquality training destination of IT graduates in the south of Vietnam. SCSE has met the demand for the IT engineer force by providing a number of software and network engineers with good skills. The first cohorts of graduates have gained remarkable success in top-rated Vietnamese and global companies.

SCSE offers two academic programs: Computer Science (Bachelor of Engineering of Information Technology in Computer Science) and Network Engineering (Bachelor of Engineering of Information Technology in Network Engineering). These programs are designed to meet international standards and successfully accredited by Asian University Network (AUN) in 2009. The programs equip students with in-depth knowledge in Information Technology, applying theories to designing and developing software programs or network systems. SCSE completely uses English for teaching courses in order to train students with technical skills and valuable soft skills including using English fluently in international working environment, good team working and effective communication skills.

The programs are also articulated by several prestigious oversea universities, such as Rutgers University (USA), Binghamton University (USA), the University of Nottingham (UK), the University of New South Wales (Australia). Qualified professors and lecturers deliver lectures using advanced teaching methods that combine theoretical lectures and laboratory practices with the state-of-the-art technology. Students have opportunities to apply knowledge to solve problems in modern, well-equipped, and energetic learning environment.



2. Program Mission

The general mission of School of Computer Science and Engineering is:

- To maintain an excellent quality of teaching at undergraduate and postgraduate levels
- To foster the staff development and the research of lecturers and professors
- To collaborate with the industry in improving the quality of teaching as well as in pursuing IT research for the benefit of Vietnam.

3. Program Outcomes

Upon graduation, our students should achieve:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to work effectively on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

In terms of knowledge, skill, professional ethics and career opportunities, graduates will have the following outcomes:

- a. Knowledge:
 - Politics and Humanities
 - English
 - Computing: an ability to use the techniques, skills, and modern engineering and computing tools necessary for engineering practice
 - Professional:
 - o an ability to identify, formulate, and solve engineering and computing problems

- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- an ability to design and conduct experiments, as well as to analyze and interpret data
- b. Skills:
 - Communication: an ability to represent result and communicate effectively
 - Natural Science Applicability: an ability to apply knowledge of mathematics, science, and engineering
 - Team Working: an ability to function on multidisciplinary teams
 - Career Development: a recognition of the need for, and an ability to engage in lifelong learning
- c. Professional ethics:
 - An understanding of professional and ethical responsibility
 - The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- d. Career opportunities:
 - IT engineers in factories, companies, organizations...
 - Pursuing a higher degree in Vietnam or abroad

4. Job Opportunities

- Graduates will be well-positioned to apply for roles with high payment in Vietnamese
 or global companies. The top graduates get important positions in well-known IT
 companies, banks and enterprises. The last groups of graduates have had excellent
 jobs in well-known IT companies such as Renesas, FPT, CSC, GCS, TMA; or banks and
 enterprises such as BIDV and AAA. In addition, several graduates are pursuing masters
 and doctoral degrees with full or partial scholarship in top overseas universities in
 USA, UK, and Australia.
- Expert analysis, design, installation of information technology projects to meet different applications in agencies, companies, schools.
- Can work as a Project Development Specialist, planning, policy development, or a developer of software systems.
- Work in manufacturing companies, outsourcing in the country as well as abroad. Work at consulting firms that suggest solutions, build and maintain information systems or work in information technology.

• Scientific researchers and information technology applicants at research institutes, centers and research institutes of ministries, branches, universities and colleges.

5. Academic Program

The program specification of School of Computer Science and Engineering contains the following information:

- Degree awarding body/institution: International University of HCM
- **Teaching institution:** School of Computer Science and Engineering, International University of VNU-HCM
- Accreditation: AUN accreditation, recognized in 2009
- Name of the degree: Bachelor of Engineering
- Program title: Computer Science, Network Engineering
- Learning outcomes of the program:
 - Politics and Humanities
 - English
 - Computing: an ability to use the techniques, skills, and modern engineering and computing tools necessary for engineering practice
 - Professional:
 - an ability to identify, formulate, and solve engineering and computing problems
 - an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
 - an ability to design and conduct experiments, as well as to analyze and interpret data
 - o Communication: an ability to represent result and communicate effectively
 - Natural science applicability: an ability to apply knowledge of mathematics, science, and engineering
 - o Team working: an ability to function on multidisciplinary teams
 - Career development: a recognition of the need for, and an ability to engage in lifelong learning
 - o An understanding of professional and ethical responsibility
 - The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
 - o IT engineers in factories, companies, organizations...
 - Pursuing a higher degree in Vietnam or abroad

6. Program Objectives

Program objectives for Computer Science

- Apply effectively their knowledge and skills as computer engineers within the industry as well as the state and federal agencies dealing with analysis and design of modern computing engineering systems and processes;
- Work and communicate effectively with others on multi-disciplinary teams to develop practical, technically-sound, cost-effective solutions to complex and diverse computer engineering problems;
- Maintain an active program of lifelong learning and continuing education while practicing computer engineering in an ethical and professional responsible manner;
- Seek leadership roles as practitioners and become active members within professional and technical societies.

Program objectives for Network Engineering

- Applying efficiently technical knowledge and practical skills to analyzing and solving problems of modern network and communication systems.
- Communicating and collaborating in teamwork environment effectively to deliver technical knowledge, ideas, proposals and solutions.
- Committing to technical capability in working environment and higher education programs by continuous self-improvement and lifelong learning.
- Seeking leadership roles and becoming proactive individuals with ethical and social responsibility in professional engineering societies.

7. Accreditation

Computer Science programme was certified with the AUN Actual Quality Assessment at program level in 2009 by AUN.

8. Admission Criteria of the Program

- National Entrance Competition that occurs in July for all candidates in the accredited Vietnamese educational system
- Direct admission based on students' academic performance at high schools and interviews for students who are in the foreign educational system, or
- Degree transfer based on students' academic performance in the previous years and interviews for students who are in other programs inside and outside IU.

- Program types: IU or Twinning
 - IU program: Students in this program receive entire education at IU. Students earn the degrees awarded by IU once completed the program.
 - Twinning program: Students in this program spend the first two years of study at IU. After that, they will be transferred to the partner universities to spend the last two years of study and eventually receive the Bachelor of Engineering degree at the partner universities. Courses which students take at IU and the partner universities are determined in an agreement decided by both IU and the partner Nottingham University.

9. Benchmarking

The curriculum is designed and compared with other top universities' program such as Computer Science course at the University of Nottingham.

10. Teaching, Learning Strategies

Consider students as the center and nurture reflective learning

- Classroom activities include class discussion and group discussion.
- Students are required to participate in laboratory sessions to learn and practice.
- Lecturers give students assignment including homework, quiz in most courses. Assignments for students to prepare topics and make reports and oral presentation may be given.
- Each classroom is well-equipped with a computer, projector and white board. These facilities together with Blackboard system support lecturers in providing course materials to class.
- Foreign instructors who are expert in their fields are invited to teach at IU.
- Instructors are assisted by Teaching Assistants whose GPA of that subject is greater than 80.
- In general, the courses emphasize on the creativity, independence and teamwork. One of the teaching strategies is to help students to know how to identify the main issues of the problem so that they will learn to have a practical mind and be focused.

11. Student Assessment

Course assessment:

 According to the Academic Regulations of IU-VNU, the assessments fall into three categories as follows:

- Final exam: 35% 60%
- o Midterm exam: 20% 40%
- Others (e.g. In-class quizzes, group presentation): 10% 30%
- The final grade of a laboratory course includes:
- Laboratory assignment: 70% 80%
- Laboratory final exam: 20% 30%

Extra-curriculum activities:

- Internship: Students will be required to do an internship in a company during summers. Students will have to manage work, projects and learn how to work in a professional environment.
- Social activities: Many social activities for students including Blood donation, IU singer, IU Gaming Tour, Green summer, etc. are frequently organized by the Student Association and Youth Union. Many Soft Skill clubs are established to train students with essential skills such as leader skills, presentation skills, etc. besides their academic experiences.

12. Program Structure and Requirements including Levels, Modules, and

Credits

The School of Computer Science and Engineering has two academic programs: Bachelor of Engineering of Information Technology in Computer Science and Bachelor of Engineering of Information Technology in Network Engineering. These programs follow all international practices and successfully assessed by Asian University Network in 2009. The curriculum gives students a solid science and engineering foundation, practical skills which courses are grouped into General Courses (34%), Core Courses (44.2%), Major Courses (21.8%).

12.1. Distribution of academic curriculum

No	Education	Credits	Percent
1	General Courses	53	35.6%
2	Core Courses	63	42.3%
3	Major Courses	33	22.1%
	Total	149	100.0 %

• **Requirement for graduation:** 149 credits

 Program specification's update: The curriculum will be updates new courses to supplement practical subjects that help students take the initiative new technologies who are essential for the job after graduation.

12.2. Program structure and content

School of Computer Science and Engineering, one of the first four schools in International University, teaches in English. International University is the first public university in Vietnam that uses English (except political courses) as the primary language in teaching and researching. Therefore, students' English skill is very important. International University will organize English placement test for all freshmen when they enter the university.

Following the test's result (which is converted to TOEFL pBT scale), students studied all subjects by level:

- Level 1: TOEFL pBT > 500: immediately take courses of undergraduate program in their first semester.
- Level 2: TOEFL pBT < score ≤ 500: take Intensive English 2 (IE2) courses and several courses of undergraduate program in their first semester.
- Level 3: TOEFL pBT ≤ 430: take Intensive English 1 (IE1) courses in their first semester; take IE2 courses and several courses of undergraduate program in their second semester.

In addition, to be eligible for graduation, students have to submit the TOEFL iBT score report with score \ge 79 or TOEFL PBT score \ge 550 or IELTS score \ge 6.5.

English courses to gradually raise the students' English competency from Pre-Intermediate to Advanced levels, focus on all the major areas of English language acquisition: academic reading skills, strategies for enhancing listening and note taking skills in lectures, techniques for effective academic presentations, skills in academic essay writing, technical and research writing.

The curriculum gives students a solid science and engineering foundation with emphasis on scientific research, practical skills. Student' program duration is typically 4 years (8 semesters), students with low English proficiency at the entrance (determined by the grade of English placement test). The academic year starts at the beginning of September and comprises 2 semesters: semester 1 (Fall) and semester 2 (Spring). Semester 3 (Summer) can also be organized, if necessary. Semester 1 starts in September and semester 2 starts in February. Each semester lasts for 18 weeks with 15 weeks for lectures, 1 week for mid-term exams and 2 weeks for final exams. Summer semester is optional, starts in June and lasts for 8 weeks with 5 weeks for lectures, 1 week for mid-term exams and 2 weeks for lectures, 1 week for each semester is 18. Students can take up to 24 credits and no less than 12 credits each semester except for the last semester when they perform the final thesis. A

typical course has 3 credits, the lab has 1 credit and the thesis has 10 credits. Summer Semester gives students the opportunity to accelerate their studies to graduate sooner, to catch up the delay or reduce workloads in the coming years.

12.3. Curriculum description

After the first two years, students will select one of these major: Network Engineering and Computer Science.

12.3.1. Computer Science curriculum

Computer Science curriculum includes the following clusters:

Curriculum map:



Curriculum Map for Computer Science

General courses:

It includes 20 courses in Mathematics, Physics, Chemistry, and English, Political Economy, Physical training. The courses in Mathematics, Physics, and Chemistry provide background for studying a computer program. The students will acquire the sufficient English fluency necessary for active study and research at the IU or at any other international institutions throughout the world.

No	Courses	Code	Credits C(T,P)	Term	Language
I	Social Science				
1	Principles of Marxism	PE011IU	5		Vietnamese
2	Revolutionary Lines of	PE013IU	3		Vietnamese
	Vietnamese Communist Party				
3	Ho Chi Minh's Thought	PE012IU	2		Vietnamese
4	Writing AE1	EN007IU	2	1, 2	English
5	Listening AE1	EN008IU	2	1, 2	English
6	Writing AE2	EN011IU	2	1, 2	English
7	Speaking AE2	EN012IU	2	1, 2	English
8	Critical Thinking	PE008IU	3(3,0)	2	English
П	Natural Science				
9	Calculus 1	MA001IU	4 (4,0)	1	English
10	Calculus 2	MA003IU	4 (4,0)	2	English
11	Calculus 3	MA023IU	4 (4,0)	3	English
12	Physics 1	PH013IU	2 (2,0)	1	English
13	Physics 2	PH014IU	2 (2,0)	1	English
14	Physics 3	PH015IU	3 (3,0)	2	English
15	Physics 3 Laboratory	PH016IU	1 (0,1)	2	English
16	Physics 4	PH204	2 (2,0)	3	English
17	Chemistry for Engineers	CH011IU	3 (3,0)	1	English
18	Chemistry Laboratory	CH012IU	1 (0,1)	1	
	Military & Physical Education				
19	Military Education	MP101	4	1-6	Vietnamese
20	Physical Training 1	PT001IU	3	1-6	Vietnamese
21	Physical Training 2	PT002IU	3	1-6	Vietnamese

Core courses:

It includes 19 courses in mathematics and subjects major. All of the courses are provide students with an adequate science foundation coursework. Having basic and advanced knowledge of computer science and information technology, capable of designing complex computing systems, high quality scientific and technological testing software, and management of computer systems. Students can ability to self-study, independent analysis and research into in-depth issues in the field of Computer Science and its applications in Computer Science. Students will be required to do an internship during summer's semester. Internship' subject is a compulsory. Internship is designed to equip students with the skills of analyzing the design of information systems, familiarizing them with software programming, web programming.

No	Courses	Code	Credits C(T,P)	Term	Language
1	Discrete Mathematics	MA020IU	3 (3,0)	3	English
2	Probability, Statistics & Random	MA026IU	3 (3,0)	5	English
	Process				
3	Introduction to Computing	IT064IU	3 (3,0)	1	English
4	C/C++ Programming in Unix	IT116IU	4 (3,1)	2	English
5	Object-Oriented Programming	IT069IU	4 (3,1)	3	English
6	Data Structures and Algorithms	IT013IU	4 (3,1)	4	English
7	Theoretical Models in Computing	IT063IU	4 (3,1)	3	English
8	Principles of Database	IT079IU	4 (3,1)	4	English
	Management				
9	Digital Logic Design	IT067IU	3 (3,0)	3	English
10	Digital Logic Design Laboratory	IT099IU	1 (0,1)	3	English
11	Object-Oriented Analysis and	IT090IU	4 (3,1)	4	English
	Design				
12	Computer Architecture	IT089IU	4 (3,1)	4	English
13	Operating Systems	IT017IU	4 (3,1)	5	English
14	Software Engineering	IT076IU	4 (3,1)	5	English
15	Web Application Development	IT093IU	4 (3,1)	6	English
16	Computer Networks	IT091IU	4 (3,1)	5	English
17	Internship	IT082IU	3 (0,3)		English
18	Entrepreneurship	IT120IU	3 (3,0)	7	English

Major courses:

There are 7 major courses. Students will learn how analyze, design and develop and deploy a system, solve complex problems, analyze and propose practical solutions to solve, and establish feasible objectives. Students will do Special Study of the Field and Thesis within 2 semesters in their last academic year.

Students are required to complete Special Study of the Field courses before they can start doing their theses, which are compulsory for graduation. It takes at least 3 months to finish a thesis.

No	Courses	Code	Credits C(T,P)	Term	Language
1	Introduction to Artificial Intelligence	IT097IU	4 (3,1)	6	English
2	Principles of Programming	IT092IU	4 (3,1)	5	English
	Languages				
3	Elective 1		4	6	English
4	Elective 2		4	7	English
5	Elective 3		4	7	English
6	Special Study of the Field	IT083IU	3(0,3)	7	English
7	Thesis	IT058IU	10(0,10)	8	English

Electives: Students take at least 3 elective courses.

No	Courses	Code	Credits C(T,P)	Term	Language
1	Computer Graphics	IT024IU	4 (3,1)	5,6	English
2	Software Project Management	IT056IU	4 (3,1)	5,6	English
3	Information System Management	IT094IU	4 (3,1)	5,6	English
4	Net-Centric Programming	IT096IU	4 (3,1)	5,6	English
5	Software Architecture	IT114IU	4 (3,1)	5,6	English
6	Digital Image Processing	IT130IU	4 (3,1)	5,6	English
7	Introduction to Data Mining	IT132IU	4 (3,1)	5,6	English
8	Mobile Application Development	IT133IU	4 (3,1)	5,6	English
9	Internet of Things	IT134IU	4 (3,1)	5,6	English

12.3.2. Network Engineering curriculum

Network Engineering curriculum includes the following clusters:

Curriculum map:



Curriculum Map for Network Engineering

Elective courses:

- Introduction to Distributed
- .
- Software Project Management System and Network Security Introduction to Wireless Network System and Network Administration .

General courses:

It includes 20 courses in Mathematics, Physics, Chemistry, and English, Political Economy, Physical training. The courses in Mathematics, Physics, and Chemistry provide background for studying a computer program. The students will acquire the sufficient English fluency necessary for active study and research at the IU or at any other international institutions throughout the world.

No	Courses	Code	Credits C(T,P)	Term	Language
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1	Principles of Marxism	PE011IU	5		Vietnamese
2	Revolutionary Lines of	PE013IU	3		Vietnamese
	Vietnamese Communist Party				
3	Ho Chi Minh's Thought	PE012IU	2		Vietnamese
4	Writing AE1	EN007IU	2	1, 2	English
5	Listening AE1	EN008IU	2	1, 2	English
6	Writing AE2	EN011IU	2	1, 2	English
7	Speaking AE2	EN012IU	2	1, 2	English
8	Critical Thinking	PE008IU	3(3,0)	2	English
П	Natural Science				
9	Calculus 1	MA001IU	4 (4,0)	1	English
10	Calculus 2	MA003IU	4 (4,0)	2	English
11	Calculus 3	MA023IU	4 (4,0)	3	English
12	Physics 1	PH013IU	2 (2,0)	1	English
13	Physics 2	PH014IU	2 (2,0)	1	English
14	Physics 3	PH015IU	3 (3,0)	2	English
15	Physics 3 Laboratory	PH016IU	1 (0,1)	2	English
16	Physics 4	PH204	2 (2,0)	3	English
17	Chemistry for Engineers	CH011IU	3 (3,0)	1	English
18	Chemistry Laboratory	CH012IU	1 (0,1)	1	
Ш	Military & Physical Education				
19	Military Education	MP101	4	1-6	Vietnamese
20	Physical Training 1	PT001IU	3	1-6	Vietnamese
21	Physical Training 2	PT002IU	3	1-6	Vietnamese

Core courses:

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2	Probability, Statistics & Random	MA026IU	3 (3,0)	5	English
	Process				
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7	Theoretical Models in Computing	IT063IU	4 (3,1)	3	English
8	Principles of Database	IT079IU	4 (3,1)	4	English
	Management				
9	Digital Logic Design	IT067IU	3 (3,0)	3	English
10	Digital Logic Design Laboratory	IT099IU	1 (0,1)	3	English
11	Object-Oriented Analysis and	IT090IU	4 (3,1)	4	English
	Design				
12	Computer Architecture	IT089IU	4 (3,1)	4	English
13	Operating Systems	IT017IU	4 (3,1)	5	English
14	Software Engineering	IT076IU	3 (2,1)	5	English
15	Web Application Development	IT093IU	4 (3,1)	5	English
16	Computer Networks	IT091IU	4 (3,1)	5	English
17	Internship	IT082IU	3 (0,3)		English
18	Entrepreneurship	IT120IU	3 (3,0)	7	English

Major courses:

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Students are required to complete Special Study of the Field courses before they can start doing their theses, which are compulsory for graduation. It takes at least 3 months to finish a thesis.

No	Courses	Code	Credits C(T,P)	Term	Language
1	Information System Management	IT094IU	4 (3,1)	6	English
2	Net-Centric Programming	IT096IU	4 (3,1)	6	English
3	Elective 1		4	6	English
4	Elective 2		4	7	English
5	Elective 3		4	7	English
6	Special Study of the Field	IT083IU	3(0,3)	7	English
7	Thesis	IT058IU	10(0,10)	8	English

Electives: Students take at least 3 elective courses.

No	Courses	Code	Credits C(T,P)	Term	Language
1	Network Design and Evaluation	IT045IU	4 (3,1)	5,6	English
2	Software Project Management	IT056IU	4 (3,1)	5 <i>,</i> 6	English
3	Introduction to Distributed	IT112IU	4 (3,1)	5 <i>,</i> 6	English
	Computing				
4	System and Network Security	IT117IU	4 (3,1)	5,6	English
5	Introduction to Wireless Network	IT122IU	4 (3,1)	5,6	English
6	Network Management and	IT124IU	4 (3,1)	5,6	English
	Protocols				
7	System & Network Administration	IT125IU	4 (3,1)	5 <i>,</i> 6	English
8	Digital Image Processing	IT130IU	4 (3,1)	5,6	English
9	Introduction to Data Mining	IT132IU	4 (3,1)	5,6	English
10	Mobile Application Development	IT133IU	4 (3,1)	5,6	English
11	Internet of Things	IT134IU	4 (3,1)	5,6	English

13. IU Program

13.1. IU CS curriculum – TOEFL \geq 500 (4 Years)

Freshman Year								
Semester 1	L	Credits	Semester 2	2	Credits			
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4			
PH013IU	Physics 1	2	PH015IU	Physics 3	3			
PH014IU	Physics 2	2	PH016IU	Physics 3 Laboratory	1			
CH011IU	Chemistry for Engineers	3	EN011IU	Writing AE2	2			
CH012IU	Chemistry Laboratory	1	EN012IU	Speaking AE2	2			
EN007IU	Writing AE1	2	IT116IU	C/C++ Programming in	4			
				Unix				
EN008IU	Listening AE1	2	PE008IU	Critical Thinking	3			

IT064IU	Introduction to	3	PE011IU	PE011IU Principles of Marxism				
	Computing				• •			
Total Cred	its	19	Total Cred	its	24			
Sophomor	re Year							
Semester			Semester	Semester 2				
MA023IU		4	1108910	Computer Architecture	4			
PH01210	Physics 4	2	1109010	Object-Oriented	4			
	Digital Lagia Dagian	2		Analysis and Design	4			
1106710	Digital Logic Design	3	110/910	Management	4			
	Digital Logic Docign	1		Data Structures and	1			
1109910	Laboratory	T	1101310	Algorithms	4			
	Object-Oriented	4	-	Algorithms				
1100510	Programming	-						
IT063IU	Theoretical Models in	4	PF013IU	Revolutionary Lines of	3			
	Computing	•	1 202010	Vietnamese Communist	U			
				Party				
MA020IU	Discrete Mathematics	3						
PE012IU	Ho Chi Minh's Thoughts	2						
Total Cred	its	23	Total Cred	19				
Junior Yea	ar							
Semester 1	L		Semester	2				
MA026IU	Probability, Statistic &	3	IT097IU	Introduction to Artificial	4			
	Random Process			Intelligence				
IT076IU	Software Engineering	4	IT092IU	Principles of	4			
				Programming				
				Languages				
IT077IU	Operating Systems	4		Elective	4			
IT091IU	Computer Networks	4	PT002IU	Physical Training 2	3			
PT001IU	Physical Training 1	3	IT093IU	Web Application	4			
	•-	10		Development				
Total Cred	lts	18	Total Cred	its	19			
Summer S	emester							
Total Crad	internsnip	3						
Sonior Vo		5						
	Special Study of the Field	3	11058111	Thesis	10			
IT102111	Fntrenreneurshin	<u>ן</u>	1103010		10			
1110210	Flective							
	Elective	4						
Total Cred	its	14	Total Cred	10				

Total number of credits: 149 credits

Electives:

Subject ID	Subject	Credits
IT024IU	Computer Graphics	4
IT056IU	Software Project Management	4
IT094IU	Information System Management	4
IT096IU	Net-Centric Programming	4
IT114IU	Software Architecture	4
IT130IU	Digital Image Processing	4
IT132IU	Introduction to Data Mining	4
IT133IU	Mobile Application Development	4
IT134IU	Internet of Things	4

13.2. IU NE curriculum – TOEFL \geq 500 (4 Years)

Freshman Y	ear						
Semester 1		Credits	Semester 2	2	Credits		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4		
PH013IU	Physics 1	2	PH015IU	Physics 3	3		
PH014IU	Physics 2	2	PH016IU	Physics 3 Laboratory	1		
CH011IU	Chemistry for Engineers	3	EN011IU	Writing AE2	2		
CH012IU	Chemistry Laboratory	1	EN012IU	Speaking AE2	2		
EN007IU	Writing AE1	2	IT116IU	C/C++ Programming in	4		
				Unix			
EN008IU	Listening AE1	2	PE008IU	Critical Thinking	3		
IT064IU	Introduction to	3	PE011IU	Principles of Marxism	5		
	Computing						
Total Credits	5	19		24			
Sophomore	Year						
Semester 1			Semester 2	2			
MA023IU	Calculus 3	4	IT089IU	Computer Architecture	4		
PH012IU	Physics 4	2	IT090IU	Object-Oriented	4		
				Analysis and Design			
IT067IU	Digital Logic Design	3	IT079IU	Principles of Database	4		
				Management			
IT099IU	Digital Logic Design Lab	1					
IT069IU	Object-Oriented	4		Data Structures and	4		
	Programming		IT013IU	Algorithm			
IT063IU	Theoretical Models in 4 PE013IU Revolutionary		Revolutionary Lines of	3			
			Vietnamese Communist				
				Party			

MA020IU	Discrete Mathematics	3			
PE012IU	Ho Chi Minh's Thoughts	2			
Total Credits	5	23	Total Cred	lits	19
Junior Year					
Semester 1			Semester	2	
MA026IU	Probability, Statistic &	3	IT094IU	Information System	4
	Random Process			Management	
IT076IU	Software Engineering	4	IT096IU	Net-Centric	4
				Programming	
IT077IU	Operating Systems	4		Elective	4
IT091IU	Computer Networks	4	PT002IU	Physical Training 2	3
	Physical Training 1	3	IT093IU	Web Application	4
				Development	
Total Credits	5	18	Total Cred	lits	19
Summer Sen	nester				
IT082IU	Internship	3			
Total Credits	5	3			
Senior Year					
IT083IU	Special Study of the Field	3	IT058IU	Senior Research Thesis	10
IT102IU	Entrepreneurship	3			
	Elective	4			
	Elective	4			
Total Credits	5	14	Total Cred	10	

Total number of credits: 149 credits

Electives

Subject ID	Subject	Credits
IT045IU	Network Design and Evaluation	4
IT056IU	Software Project Management	4
IT112IU	Introduction to Distributed Computing	4
IT117IU	System and Network Security	4
IT122IU	Introduction to Wireless Network	4
IT124IU	Network Management and Protocols	4
IT125IU	System & Network Administration	4
IT130IU	Digital Image Processing	4
IT132IU	Introduction to Data Mining	4
IT133IU	Mobile Application Development	4
IT134IU	Internet of Things	4

14. Twining Program

14.1. SCSE – IU – Twining program with Nottingham University - TOEFL \geq 500

Freshman	Year				
Semester 1	L	Credits	Semester 2	2	Credits
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
EN007IU	Writing AE1	2	PH015IU	Physics 3	3
EN008IU	Listening AE1	2	PH016IU	Physics 3 Laboratory	1
IT064IU	Introduction to	3	IT116IU	C/C++ programming in	4
	Computing			Unix	
PH013IU	Physics 1	2	EN011IU	Writing AE2	2
PH014IU	Physics 2	2	EN012IU	Speaking AE2	2
PE008IU	Critical Thinking	3	MA020IU	Discrete Mathematics	3
Total Cred	its	18	Total Cred	19	
Sophomor	e Year				
Semester 1	L	-	Semester 2	2	
IT069IU	Object-Oriented	4	IT093IU	Web Application	4
	Programming			Development	
IT063IU	Theoretical Models in	4	IT089IU	Computer Architecture	4
	Computing				
IT007UN	Functional	3	IT097IU	Introduction to Artificial	4
	Programming			Intelligence	
IT067IU	Digital Logic Design	3	IT011UN	Skills for	3
				Communicating	
				Information	
IT099IU	Digital Logic Design Lab	1	IT079IU	Principles of Database	4
				Management	
IT076IU	Software Engineering	4			
Total Cred	its	19	Total Cred	its	19

Total number of credits: 75

14.2. SCSE – IU – Twining program with West of England University - TOEFL \geq 500

Freshman Year										
Semester 1		Credits	Semester 2	2	Credits					
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4					
PH013IU	Physics 1	2	PH015IU	Physics 3	3					
PH014IU	Physics 2	2	PH016IU	Physics 3 Laboratory	1					
CH011IU	Chemistry for Engineers	3	IT011IU	C/C++ Programming in Unix	4					
CH012IU	Chemistry Laboratory	1	EN011IU	Writing AE2	2					

EN007IU	Writing AE1	2	EN012IU	Speaking AE2	2
EN008IU	Listening AE1	2	PE008IU	Critical Thinking	3
IT064IU	Introduction to	3			
	Computing				
Total Cred	its	19	Total Cred	its	19
Sophomor	e Year				
Semester 1	L		Semester 2	2	
MA023IU	Calculus 3	4	MA024IU	Differential Equation	4
PH012IU	Physics 4	2	EE055IU	Principles of EE 2	3
IT067IU	Digital Logic Design	3	EE056IU	Principles of EE 2	1
				Laboratory	
IT099IU	Digital Logic Design Lab	1	EE050IU	Introduction to Computer	3
				for Engineers	
EE051IU	Principles of EE 1	3	IT013IU	Data Structures and	4
				Algorithms	
EE052IU	Principles of EE 1 Lab	1	IT089IU	Computer Architecture	4
IT069IU	Object-Oriented	4			
	Programming				
Total Cred	its	18	Total Cred	its	19

Total number of credits: 75 credits

14.3. SCSE – IU – Twining program with Rutgers University - TOEFL \geq 500

Freshman	Year								
Semester 1	L	Credits	Semester 2	2	Credits				
MA001IU	Calculus 1	4	MA003IU	MA003IU Calculus 2					
PH013IU	Physics 1	2	PH015IU	Physics 3	3				
PH014IU	Physics 2	2	PH016IU	Physics 3 Laboratory	1				
CH011IU	Chemistry for Engineers	3	IT011IU	C/C++ Programming in Unix	4				
CH012IU	Chemistry Laboratory	1	EN011IU	Writing AE2	2				
EN007IU	Writing AE1	2	EN012IU	EN012IU Speaking AE2					
EN008IU	Listening AE1	2	PE008IU	3					
IT064IU	Introduction to	3							
	Computing								
Total Cred	its	19	Total Cred	its	19				
Sophomor	e Year								
Semester 1	L		Semester 2	2					
MA023IU	Calculus 3	4	MA024IU	Differential Equation	4				
PH012IU	Physics 4	2	EE055IU	Principles of EE 2	3				
IT067IU	Digital Logic Design	3	EE056IU	EE056IU Principles of EE 2					

				Laboratory	
IT099IU	Digital Logic Design Lab	1	EE050IU	Introduction to Computer	3
				for Engineers	
EE051IU	Principles of EE 1	3	IT013IU	Data Structures and	4
				Algorithms	
EE052IU	Principles of EE 1 Lab	1	IT089IU	Computer Architecture	4
IT069IU	Object-Oriented	4			
	Programming				
Total Credits		18	Total Cred	its	19

Total number of credits: 75 credits

14.4. SCSE – IU – Twining program with SUNY Binghamton University - TOEFL \geq 500

Freshman	Year									
Semester 1	1	Credits	Semester 2	2	Credits					
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4					
PH013IU	Physics 1	2	PH015IU	Physics 3	3					
PH014IU	Physics 2	2	PH016IU	Physics 3 Laboratory	1					
CH011IU	Chemistry for Engineers	3	IT011IU	C/C++ Programming in	4					
				Unix						
CH012IU	Chemistry Laboratory	1	EN011IU	Writing AE2	2					
EN007IU	Writing AE1	2	EN012IU	Speaking AE2	2					
EN008IU	Listening AE1	2	PE008IU	Critical Thinking	3					
IT064IU	Introduction to	3								
	Computing									
Total Credits 19			Total Cred	Total Credits						
Sophomor	e Year									
Semester 1	1		Semester 2	2						
MA023IU	Calculus 3	4	MA024IU	Differential Equation	4					
PH012IU	Physics 4	2	EE055IU	Principles of EE 2	3					
IT067IU	Digital Logic Design	3	EE056IU	Principles of EE 2	1					
				Laboratory						
IT099IU	Digital Logic Design Lab	1	EE050IU	Introduction to	3					
				Computer for Engineers						
EE051IU	Principles of EE 1	3	IT013IU	Data Structures and	4					
				Algorithms						
EE052IU	Principles of EE 1 Lab	1	IT089IU	IT089IU Computer Architecture						
IT069IU	Object-Oriented	4								
	Programming									
Total Credits		18	Total Cred	its	19					

Total number of credits: 75 credits

15. Matrix Course & Learning Outcomes

Learning Outcome vs. Course Matrix for Computer Science Program (CS)

	Code	Course	Credit	а	b	С	d	е	f	g	h	i	j	k
	PE008IU	Critical Thinking	3	-	-	-	-	-	Н	-	S	-	-	-
	PE011IU	Principles of Marxism	5	-	-	-	-	-	-	-	S	-	-	-
	CodeCoursePE008IUCritical ThinkingPE011IUPrinciples of MarxismPE012IUHo Chi Minh's ThoughtsPE013IURevolutionary Lines of Vietnames Communist PartyeneralPhysical Training 1Physical Training 2Military EducationAcademic English 1Academic English 1Academic English 2IT102IUIT102IUEntrepreneurshipMA001IUCalculus 1MA003IUCalculus 2MA023IUCalculus 3PH013IUPhysics 1PH015IUPhysics 3 and LabPH012IUPhysics 4CH011IUChemistry for EngineersCH012IUChemistry Laboratory	2	-	-	-	-	-	-	-	S	-	-	-	
CodeCoursePE008IUCritical ThinkingPE011IUPrinciples of MarxismPE012IUHo Chi Minh's ThoughtsPE013IURevolutionary Lines of Vietname Communist PartyGeneralPhysical Training 1Physical Training 2Military EducationAcademic English 1Academic English 1Academic English 2IT102IUIT102IUEntrepreneurshipMA001IUCalculus 1MA003IUCalculus 2MA023IUCalculus 3PH013IUPhysics 1PH014IUPhysics 3 and Lab	3	-	-	-	-	-	-	-	S	-	-	-		
		Communist Party												
CodeCoursePE008IUCritical ThinkingPE011IUPrinciples of MarxismPE012IUHo Chi Minh's ThoughtsPE013IURevolutionary Lines of Vietname Communist PartyGeneralPhysical Training 1Physical Training 2Military EducationAcademic English 1Academic English 2IT102IUEntrepreneurshipMA001IUCalculus 1MA023IUCalculus 2MA023IUCalculus 3PH013IUPhysics 1PH014IUPhysics 3 and LabPH012IUPhysics 4CH011IUChemistry for EngineersCH012IUChemistry Laboratory	3	-	-	-	-	-	-	-	-	S	-	-		
		Physical Training 2	3	-	-	-	-	-	-	-	-	S	-	-
		Military Education	4	-	-	-	-	-	-	-	S	-	-	-
		Academic English 1	4	-	-	-	-	-	-	Н	-	-	-	-
		Academic English 2	4	-	-	-	-	-	-	Н	-	-	-	-
	IT102IU	Entrepreneurship	3	-	-	-	-	-	-	-	Н	-	-	-
			34											
	MA001IU	Calculus 1	4	Н	-	-	-	-	-	-	-	S	-	-
	MA003IU	Calculus 2	4	Н	-	-	-	-	-	-	-	S	-	-
	MA023IU	Calculus 3	4	Н	-	-	-	-	-	-	-	S	-	-
	PH013IU	Physics 1	2	Н	-	-	-	S	-	-	-	S	-	-
Basic	PH014IU	Physics 2	2	Н	-	-	-	S	-	-	-	S	-	-
	PH015IU	Physics 3 and Lab	4	Н	-	-	-	S	-	-	-	S	-	-
	PH012IU	Physics 4	2	Н	-	-	-	S	-	-	-	S	-	-
	CH011IU	Chemistry for Engineers	3	Н	-	-	-	-	-	-	-	S	-	-
	CH012IU	Chemistry Laboratory	1	Н	S	-	-	-	-	-	-	S	-	S
			26											
Core	MA006IU	Discrete Mathematics	3	Н	S	-	-	Н	-	-	-	-	-	S

	MA026IU	Probability, Statistic & Random Process	3	Н	S	-	-	Н	-	-	-	-	-	S
	IT063IU	Theoretical Models in Computing	4	Н	-	Н	-	-	-	-	-	Н	-	-
	IT064IU	Introduction to Computing	3	-	-	-	-	-	-	-	-	Н	Н	-
	IT067IU	Digital Logic Design	3	S	-	Н	-	-	-	-	-	-	-	-
	IT013IUData Structures and AlgorithmsIT069IUObject-Oriented Programming		4	Н	Н	-	-	-	-	-	-	Н	-	Н
	IT069IU	Object-Oriented Programming	4	-	Н	Н	-	-	-	-	-	Н	-	-
	IT076IU	Software engineering	4	Н	S	-	Н	Н	-	Н	-	-	-	-
	IT077IU	Operating Systems	4	Н	-	Н	-	S	-	S	-	-	S	-
	IT079IU	Principles of Database Management	4	S	Н	Н	-	-	-	-	-	Н	-	S
	IT089IU	Computer Architecture	4	Н	Н	-	-	Н	-	S	-	-	-	S
	IT090IU	Object-oriented analysis and design	4	-	-	Н	-	Н	S	S	-	-	-	Н
	IT091IU	Computer Networks	4	Н	-	Н	S	-	-	-	-	-	-	-
	IT093IU	Web Application Development	4	-	Н	Н	-	S	-	S	-	-	-	Н
	IT099IU	Digital Logic Design Lab	1	-	-	-	I	-	-	-	-	-	-	Н
	IT102IU	Internship	3	Н	-	-	I	-	-	-	Н	-	Н	-
	IT116IU	C/C++ Programming in UNIX	4	Н	S	S	-	Н	S	S	-	-	S	Н
			60											
	IT092IU	Principles of Programming Languages	4	Н	-	S	-	-	-	-	-	Н	-	S
	IT097IU	Introduction to Artificial Intelligence	4	Н	S	S	I	-	-	-	-	Н	Н	S
	IT083IU	Special Study of the Field	3	Н	Н	-	-	-	-	-	-	Н	S	S
Major	IT058IU	Senior Research Thesis	10	Н	Н	Н	-	S	S	-	S	Н	S	S
		Elective 1	4	-	-	-	-	-	-	-	-	-	-	-
		Elective 2	4	-	-	-	-	-	-	-	-	-	-	-
		Elective 3	4	-	-	-	I	-	-	-	-	-	-	-
			33											
	IT024IU	Computer Graphics	4	Н	-	Н	I	-	-	-	-	-	-	Н
	IT056IU	Software Project Management	4	Н	S	-	Н	Н	-	-	Н	-	Н	-
Elective	IT094IU	Information System Management	4	-	-	-	-	-	Н	-	Н	-	S	-
	IT096IU	Net-Centric Programming	4	Н	S	S	-	S	S	S	-	-	Н	Н

IT114IU	Software Architecture	4	н	-	н	-	-	-	-	-	н	-	-
IT132IU	Introduction to Data Mining	4	-	Н	-	-	Н	-	-	-	-	Н	-
IT130IU	Digital Image Processing	4	Н	-	Н	-	-	-	-	-	-	-	S

Notes:

The CLOs of the CS program include:

(a) an ability to apply knowledge of mathematics, science, and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic,

environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to work effectively on multi-disciplinary teams

(e) an ability to identify, formulate, and solve engineering problems

(f) an understanding of professional and ethical responsibility

(g) an ability to communicate effectively

(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

(i) a recognition of the need for, and an ability to engage in life-long learning

(j) a knowledge of contemporary issues

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Note: H: Highly Supportive; S: Supportive; -: None

Learning Outcome vs. Course Matrix for NE Program

	Code	Course	Credit	а	b	С	d	е	f	g	h	i	j	k
	PE008IU	Critical Thinking	3	-	-	-	-	-	Н	-	S	-	-	-
	PE011IU Principles of Marxism		5	-	-	-	-	-	-	I	S	-	-	-
	PE012IU Ho Chi Minh's Thoughts		2	-	-	-	-	-	-	I	S	-	-	-
	PE013IU Revolutionary Lines of Vietnamese Communist Party		3	-	-	-	-	-	-	-	S	-	-	-
Gonoral		Physical Training 1	3	-	-	-	-	-	-	-	-	S	-	-
General		Physical Training 2	3	-	-	-	-	-	-	-	-	S	-	-
		Military Education	4	-	-	-	-	-	-	-	S	-	-	-
		Academic English 1	4	-	-	-	-	-	-	Н	-	-	-	-
		Academic English 2	4	-	-	-	-	-	-	Н	-	-	-	-
	IT102IU	Entrepreneurship	3	-	-	-	-	-	-	I	Н	-	-	-
			34											
Basic	MA001IU	Calculus 1	4	Н	-	-	-	-	-	I	-	S	-	-
	MA003IU	Calculus 2	4	Н	-	-	-	-	-	-	-	S	-	-
	MA023IU	Calculus 3	4	Н	-	-	-	-	-	-	-	S	-	-
	PH013IU	Physics 1	2	Н	-	-	-	S	-	-	-	S	-	-
	PH014IU	Physics 2	2	Н	-	-	-	S	-	-	-	S	-	-
	PH015IU	Physics 3 and Lab	4	Н	-	-	-	S	-	-	-	S	-	-
	PH012IU	Physics 4	2	Н	-	-	-	S	-	-	-	S	-	-
	CH011IU	Chemistry for Engineers	3	Н	-	-	-	-	-	-	-	S	-	-
	CH012IU	Chemistry Laboratory	1	Н	S	-	-	-	-	-	-	S	-	S
			26											
	MA006IU	Discrete Mathematics	3	Н	S	-	-	Н	-	-	-	-	-	S
	MA026IU	Probability, Statistic & Random Process	3	Н	S	-	-	Н	-	-	-	-	-	S
Core	IT063IU	Theoretical Models in Computing	4	Н	-	Н	-	-	-	-	-	Н	-	-
	IT064IU	Introduction to Computing	3	-	-	-	-	-	-	-	-	Н	Н	-
	IT067IU	Digital Logic Design	3	S	-	Н	-	-	-	-	-	-	-	-

	IT013IU	Data Structures and Algorithms	4	Н	Н	-	-	-	-	-	-	Н	-	Н
	IT069IU	Object-Oriented Programming	4	-	Н	Н	-	-	-	-	-	Н	-	-
	IT076IU	Software engineering	4	Н	S	I	Н	Н	-	Н	-	-	-	-
	IT077IU	Operating Systems	4	Н	-	н	-	S	-	S	-	-	S	-
	IT079IU	Principles of Database Management	4	S	Н	н	-	-	-	-	-	Н	-	S
	IT089IU	Computer Architecture	4	Н	Н	I	-	Н	-	S	-	-	-	S
	IT090IU	Object-oriented analysis and design	4	-	-	н	-	Н	S	S	-	-	-	Н
	IT091IU	Computer Networks	4	Н	-	н	S	-	-	-	-	-	-	-
	IT093IU	Web Application Development	4	-	Н	н	-	S	-	S	-	-	-	Н
	IT099IU	Digital Logic Design Lab	1	-	-	I	-	-	-	-	-	-	-	Н
	IT102IU	Internship	3	Н	-	-	-	-	-	-	Н	-	Н	-
	IT116IU	C/C++ Programming in UNIX	4	Н	S	S	-	Н	S	S	-	-	S	Н
			60											
	IT094IU	Information System Management	4	-	-	-	-	-	Н	-	Н	-	S	-
	IT096IU	Net-Centric Programming	4	Н	S	S	-	S	S	S	-	-	Н	Н
	IT083IU	Special Study of the Field	3	Н	Н	I	-	-	-	-	-	Н	S	S
Major		Conjer Desearch Thesis											(
	1103810	Senior Research Thesis	10	Н	Н	Н	-	S	S	-	S	Н	S	S
	1103810	Elective 1	10 4	Н	Н	Н	-	S	S	-	S	H	S	S
		Elective 1 Elective 2	10 4 4	H	H	H	-	S	S	-	S	H	S	S
		Elective 1 Elective 2 Elective 3	10 4 4 4	H	H	H	-	S	S	_	S	H	S	S
		Elective 1 Elective 2 Elective 3	10 4 4 4 33	H	H	H	-	S	S	-	S	H	S	S
	IT056IU	Elective 1 Elective 2 Elective 3 Software Project Management	10 4 4 4 33 4	H	H S	H	- H	S H	S 	-	S H	H -	S	S
Flactive	IT056IU IT112IU	Elective 1 Elective 2 Elective 3 Software Project Management Introduction to Distributed Computing	10 4 4 33 4 4	H	H S -	т – т	- H	S H S	S - -	- - - S	S 	H - -	S H S	S - - H
Elective	IT056IU IT112IU IT117IU	Elective 1 Elective 2 Elective 3 Software Project Management Introduction to Distributed Computing System and Network Security	10 4 4 33 4 4 4 4 4 4 4 4 4 4 4 4	H H H H	H S - H	H - H -	- H -	S H S S	S - - -	- - S S	S H - S	H - - H	S H S S	S - H S
Elective	IT056IU IT056IU IT112IU IT117IU IT122IU	Elective 1 Elective 2 Elective 3 Software Project Management Introduction to Distributed Computing System and Network Security Introduction to Wireless Network	10 4 4 33 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	H H H H	H S - H	н - Н - Н	- H - H	S H S S -	S - - -	- - - S -	S H - S -	H - - H -	S H S -	S - H S -

Notes:

The CLOs of the NE program include:

(a) an ability to apply knowledge of mathematics, science, and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic,

environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to work effectively on multi-disciplinary teams

(e) an ability to identify, formulate, and solve engineering problems

(f) an understanding of professional and ethical responsibility

(g) an ability to communicate effectively

(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

(i) a recognition of the need for, and an ability to engage in life-long learning

(j) a knowledge of contemporary issues

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Note: H: high; S: Supportive; -: None

16. Course Description

Listening Academic English 1 (EN008IU)

To provide students with the study skills needed to listen to academic lectures, take effective notes and prepare for examinations.

This course provides students with instruction and practice in essay writing, including transforming ideas into different functions of writing such as definitions, classifications, cause – effects, arguments. Through reading a few representative university-level texts, students will develop the ability to read critically and write accurately, coherently, and in appropriate academic style in response to those texts. They will also practice necessary skills to write a research report.

Speaking Academic English 2 (EN012IU)

Students are provided with practical strategies for effective presentations. They also have chance to practice giving presentations in class and receive feedback. *Prerequisite: EN007 & EN008 (Academic English1)*

Writing Academic English 2 (EN011IU)

This course provides an overview of the organizational format for a research paper and assists students in completing research projects in any content area course by providing assistance in writing effective research papers using a step-by-step process approach. Course content includes the components of a research paper, and techniques of selecting and narrowing topics; writing argumentative thesis statements; outlining; locating and documenting sources; taking notes. Students also have to read extensively about a chosen topic to explore different ideas of multiple authors about that topic. Students work with projects relating to their content area courses.

Prerequisite: EN007 & EN008 (Academic English1)

Calculus 1 (MA001IU)

Functions; Limits; Continuity; Derivatives, Differentiation, Derivatives of Basic Elementary Functions, Differentiation Rules; Applications of Differentiation: l'Hôpital's Rule, Optimization, Newton's Method; Anti-derivatives; Integrals, Definite Integral, Fundamental Theorem of Calculus; Techniques of Integration.

Calculus 2 (MA003IU)

Integration by parts, trigonometric substitution, partial fractions technique, imroer integrals, areas, volumes, arc length, average of functions, applications to physics and engineering, modeling with differential equations, separable equations, logistic equation, predator-prey systems, Sequence and Series; Convergence Tests; Power Series; Taylor and Maclaurin Series; applications of Taylor polynomials, using series to solve differential equations.

Calculus 3 (MA023IU)

Cartesian Coordinates; Lines, Planes and Surfaces; Dot and Cross Products; Functions of Several Variables; Limits, Continuity, Partial Derivatives, Tangent Planes; Gradient Vectors; Extrema; Lagrange Multipliers; Multiple Integrals: Double Integrals, Triple Integrals, Techniques of Integration; Vector Fields, Line Integrals, Surface Integrals.

Discrete Mathematics (MA020IU)

Logic, Logical equivalences, Predicates and quantifiers, Methods of proof, Sets, Functions, Mathematical induction, Basical rules of counting, Pigeonhole principle, Permutations and combinations, Binomieal coefficeints, Generalized permutations and combinations, Integers and division, Linear congruences, Relatinos and their properties, n-ary relations and aplications, Representing relations, Closures of relations, Equivalence relations, Partial orderings, Introduction to graphs, Graph terminology, Representating graphs and graph isomorphism, Connectivity, Euler and Hamilton paths, Shortest-path problems, Planar graphs, Graph coloring, Introduction to trees, Applications of trees, Tree traversal, Spanning trees, Minimum spanning trees, Boolean functions, Representing Boolean functions, Logic gates, Minimization of circuits.

Physics 1 (PH013IU)

Engineering Mechanics: force, moment, equilibrium, truss, frame and machine, center of mass, centroid of composites, theorem of Pappus, beam, friction, virtual work, potential energy and stability.

Physics 2 (PH014IU)

Torque, angular momentum, static equilibrium, oscillatory, gravity, fluid dynamics, wave, sound wave, temperature, heat, First Law of Thermodynamics, Kinetic Theory of Gases, Second Law of Thermodynamics.

Physics 3 (PH015IU)

To provide a thorough introduction to the basic principles of physics to physics and engineering students in order to prepare them for further study in physics and to support their understanding and design of practical applications in their fields. Content: Electrostatics, particles in electric and magnetic fields, electromagnetism, circuits, Maxwell's equations, electromagnetic radiation.

Physics 4 (PH012IU)

Waves and optics, relativity, quantum properties of electrons and photons, wave mechanics, atomic, solid state, nuclear and elementary particle physics.

Chemistry for Engineers (CH011IU)

Introduction to chemical principles and their application. Includes stoichiometry, states of matter, atomic and molecular structure, solutions, thermodynamics, equilibrium,

oxidation-reduction, kinetics, nonmetals, metals and coordination compounds, and nuclear chemistry.

Probability, Statistics & Random Process – (MA026IU)

Probability: sample space and events, Venn Diagram and algebra of events, probability of event, additive rules, conditional probability, Bayes rules, random variables and their distributions, mathematical expectation, some discrete probability distributions, some continuous probability distributions, functions of random variables, independence.

Mathematical Statistics: Sampling distributions and data descriptions, estimation problems, hypothesis tests, linear regressions, analysis of variance, nonparametric statistics, simulation.

Introduction to Computing (IT064IU)

Basics of Computing: basic concepts, models, trends in industry. Introduction to majors and curricula, career path of all majors in computing, career orientation. Job requirements and career opportunities in industry

C/C++ Programming in Unix (IT116IU)

This course covers algorithm development and the principles of computer programming using C and C++ in a Unix environment. Topics include introduction to computers and computing, program development, C/C++ programming language syntax, and elementary numerical methods for scientists and engineers. Unix environment and utilities are also introduced.

Critical Thinking (PE008IU)

This course provides students the fundamental knowledge of critical thinking concept. This is a general thinking skill that is useful for all sorts of careers and professions.

Object-Oriented Programming (IT069IU)

Basics of programming and data structures in Java. Basic data types: loops, arrays, recursion, and pointers. Object oriented design: classes, inheritance, overloading, and polymorphism; Abstract Data Types: lists, linked lists, stacks, and queues; Introduction to algorithm analysis: O notation, searching and sorting.

Data Structures and Algorithms (IT013IU)

To investigate the essential properties of data structures and algorithms for operating on them; to use these structures as tools to assist algorithm design; to extend exposure to searching, sorting and hashing techniques.

Digital Logic Design (IT067IU)

Binary arithmetic, Boolean algebra, K-maps, Combinational circuit synthesis, Combinational MSI circuits, Sequential logic, Synchronous state machine design, Sequential MSI circuits.

Computer Architecture (IT089IU)

History and principles of computer architecture. Computer Organization, Assembly language and machine code, computer arithmetic, ALU design, computer performance, data path and control, pipelining, memory hierarchy, I/O devices, multi-processor architectures, and mobile and multi-core processors.

Operating Systems (IT017IU)

To study fundamentals of operating systems and system programming using the functions and facilities of a modern operating system.

Software Engineering (IT076IU)

Software development lifecycle, object-oriented software engineering, system specification, software measurement and estimation, software design patterns.

Internship (IT082IU)

To make students get used with the working environment in industry, give them a period to practice their skills and understand the requirements of companies.

Special Study on the Field (IT083IU) & Thesis (IT058IU)

Thesis are industry type projects, designed to ensure students have master their studies in the program. All projects are based on "Real projects" provided by industry for students to work on developing skill and applying knowledge gained from all courses throughout the program. Students will work in teams to develop requirements, design, implementation, and provide a solution to the business problems. Students may follow any suitable process model, must manage the project themselves, following all appropriate project management techniques. Success of the project is determined in large part, by whether students have adequately solved their customer's problem.

Students will be expected to deliver the final products along with all artifacts appropriate to the process model they are using (i.e.: project plan, requirements specification; system and software architect documents, design documents, test plans, source code, and installable software products).

Theoretical Models in Computing (IT063IU)

The course provides undergraduate students with mathematical reasoning, combinatorial analysis, algorithmic thinking and modeling, and automata theory as the study of abstract computing devices.

Principles of Database Management (IT079IU)

Overview of Database management, architecture; Hierarchical, network, relational models; Entity-relationship data model, relational database design; Data dependencies and Normalization, security and integrity constraints; Transaction management for multi-user database systems; SQL Server and other commercial RDBMs.

Object-Oriented Analysis and Design (IT090IU)

System modeling. System analysis and design paradigms. Product Life Cycle. Unified Process and its workflows: requirement, analysis, design, implementation, testing. Advanced topics: object-oriented databases, design patterns, Extreme Programming.

Computer Networks (IT091IU)

Network protocol design principles, reliable transport protocols, routing, quality of service, multimedia networking, Internet telephony, wireless networks.

Information System Management (IT094IU)

Focus on how information systems are used by businesses and how they impact business activities. While the technology of information systems (i.e., information technology) is presented and discussed, the key issue is how these technologies are used to solve business problems and exploit opportunities.

Web Application Development (IT093IU)

Web programming concepts and models. HTML, Java Server Page, Java Bean, MVC model, Java utilities and development environments, extended Java frameworks as Ajax and Struts.

Principles of Programming Languages (IT092IU)

The course is aimed at making the student familiar with the general concepts common to all programming languages so as to facilitate learning new languages. Language paradigms (i.e., logic, functional, procedural, object-oriented) are compared and implementation strategies are discussed.

Introduction to Artificial Intelligence (IT097IU)

This course provides a technical introduction of fundamental concepts of artificial intelligence (AI). Topics include: history of AI, agents, search (search space, uninformed and informed search, constraint satisfaction, game playing), knowledge representation (logical encodings of domain knowledge, logical reasoning systems), planning, and the language Lisp. The course is suitable for students who want to gain a solid technical background and a preparation for more advanced work in AI.

Computer Graphics (IT024IU)

Computer display systems, algorithms and languages for interactive computer graphics. 3D coordinate frame transformations. Vector, curve and surface generation. Lighting, Illumination and Shading. Camera models and image based rendering.

Software Architecture (IT114IU)

Provide a broad understanding of the software and systems architecture. The role of the architect and what role the architecture plays in relationship with the other phases of development and the organization itself.

Net-Centric Programming (IT096IU)

Advanced programming with a focus on developing software for networked systems using Linux as a reference platform. Topics: Programming Tools, Software Design, Programming Techniques, Environment of a UNIX Process, Memory Allocation, Garbage Collection, Process Control, Process Relationships, Signals, Reliable Signals, Threads, I/O Multiplexing, Datagram and Stream Sockets, Multicasting, Device Driver and Kernel Programming, Secure Programming.

Principles of EE 2 (IT070IU)

Passive and active filter circuit design, Butterworth filter design, transient analysis by classical methods and by Laplace Transform analysis, step and impulse response, two-port networks, Introduction to Fourier series, three phase circuits.

Systems and Signals (IT075IU)

Introduction to continuous- and discrete-time systems and signals, basis function representation of signals, convolution, Fourier Series, Fourier, Laplace, Z-transform theory, state space variable analysis of linear systems, basic feedback concepts.

Electronic Devices (IT074IU)

Fundamentals of semiconductor devices and microelectronic circuits, characteristics of pn, Zener diodes, and analog diode circuits. Principles of MOSFET and BJT operation, biasing, transistor analysis at midband frequencies.

Digital Electronics (IT104IU)

Principles of digital electronics, implementation of logic gates with MOSFETs and BJTs. Understanding and analysis of different logic families including NMOS CMOS, TTL and ECL. Fundamentals of digital memory circuits.

Digital System Design (IT105IU)

Hardware description using the Verilog language. Design methodologies for combinational and sequential logic circuits. Characteristics of microprocessors, fault-tolerant computer design, computer arithmetic, and advanced state machine theory. Digital machine organization for testing and fault-tolerance.

Concepts in VLSI Design (IT110IU)

To introduce concepts of digital VLSI chip design. Introductory digital VLSI chip design. CMOS technology, dynamic clocked logic, layout design rules, and analog MOSFET timing analysis.

Digital Signal Processing (IT103IU)

Introduction to digital signal processing, sampling and quantization, A/D and D/A converters, discrete time systems, convolution, z-transforms, transfer functions, digital filter realizations, fast Fourier transforms, filter design, and digital audio applications.

Embedded Systems (IT115IU)

Increasing integration of communications, multimedia and processing and relentless digitization of data (including even RF data) continues to expand the scope and complexity of embedded systems. To appreciate these advances, and to productively contribute to future advances of these systems, a critical appreciation of the underlying technology underpinning is a must.

Micro-Processing Systems (IT128IU)

Overview of microelectronic processing technology, lithography, etching, oxidation, diffusion, implantation and annealing, film deposition, epitaxy growth, metallization, process integration and simulation.

Introduction to Wireless Network (IT122IU)

This course covers the fundamental knowledge of wireless and mobile networks such as wireless signal propagation, the techniques in wireless transmission, modulation, coding,... Several wireless networks are covered such as wi-fi, blueooth, zigbee, LTE, ... The MAC protocols, routing protocols used in wireless networks are also studied.

Introduction to Data Mining (IT132IU)

This subject introduces the students to principles and algorithms of data mining, and requirements of a data mining process. Students will study data mining concepts and algorithms to solve problems of knowledge discovery. Students can develop skills of using recent data mining software for solving practical problems, and gain experience of doing independent study and research

Mobile Application Development (IT133IU)

This course is designed to introduce and familiarize students with programming in the mobile environment: Android platform will be used throughout the course. The course start with introductions to basic components, concepts, structures of Android applications then move on with common user interface elements, persistent storage, database for mobile etc. Introduction to most common tools and techniques for writing Android application is also included with hands on experience in form of lab exercise programming project.

Internet of Things (IT134IU)

The course explains the architecture, components of Internet of Thing networks. The students will study the communication techniques between the components from short range to long range such as Bluetooth, Zigbee, Wi-fi, Lora, NB-IoT,... Moreover, the data storage, organization and analytics are also studied in this course.

17. Academic Regulation

17.1. Specialization selection

After completing the first two years of the program, students are allowed to choose their specialization. Specialization is the research area which students are interested in and wish to continue with for final thesis. School of Computer Science and Engineering currently offers two specializations:

- Computer Science
- Network Engineering

Once specialization is chosen, students have to take the required courses for each specialization, relevant elective courses and final thesis.

17.2. Summer internship registration

Students are allowed to register for a summer internship before the academic year when they aim to apply for thesis.

- Objectives:
 - To develop skills in the application of theory to practical work situations;
 - o To develop skills and techniques directly applicable to their careers;
 - To provide students the opportunity to get involve with industry before graduated.
- Internship duration: 12 weeks (full-time or part time working)

17.3. Thesis registration

- Criteria:
 - Successfully accumulate at least 90% of credit numbers of the academic curriculum and finish senior project;
- Duration: minimum 12 weeks

17.4. Graduation criteria

Students have to complete all of the following requirements for graduation:

- Successfully complete the academic curriculum (149 credits) with GPA \geq 50
- Meet the minimum English requirement of 61 TOEFL iBT, 6.0 IELTS.
- Military Education Certification
- Meet other requirements in accordance with the regulations for graduation set by IU.

17.5. Scholarship information

University Scholarship (Decision No 99 & 100/ĐHQT-ĐT)

Each semester, top 10% of students with highest GPA will receive scholarship from the IU. 4% of students will receive full scholarship (12.000.000 VND for Fall/Spring semester or 6.000.000 VND for Summer semester) and 6% of students will receive half scholarship (6.000.000 VND for Fall/Spring semester or 3.000.000 for Summer semester).

Minimum requirements:

• Complete the Academic English 1 (AE1).

- Register at least 12 credits for Fall/Spring semester or 6 credits for Summer semester;
- Semester GPA \geq 70 (with no course fails in that semester)

Admission Scholarship 2012

- **Full scholarship** (full tuition exemption for 4 years equivalent to 120.000.000 VND): Students have entrance examination scores ≥ 24.
- **Partial scholarship** (half tuition exemption for 4 years equivalent to 60.000.000 VND): Student have entrance examination scores ≥ 23.
- **Condition to maintain Scholarships:** Students must have GPA each semester ≥ 70 and the score of every subject ≥ 50.

17.6. Course registration

Course registration aims at helping students gain full success in building their own training plan, selecting appropriate subjects for every semester in such a way that can meet his or her own personal capacity and conditions for the highest achievement.

- Students should register a minimum of 12 credits, except for the last semester.
- Students should register a maximum of 24 credits in one semester, except for the last semester, for those who have cumulative GPA ≥65
- The subject registration form must be approved by the academic advisors.
- For exceptional cases, students must file for the consideration of the Dean of Schools.
- Students do online course registration on the website: https://hcmiu.edu.vn/edusoftweb/ (username and password for student will be created by the university).
- The registration time will be informed at the School of Computer Science and Engineering.

Adjusting Student Timetable

When receiving the timetables, students must check the information including the number of registered courses, tuition fees, etc... if there should any errors, students must report to the Schools within three days of the timetable announcement.

The Schools must check (through the academic advisors) and give their opinions on the students' file of document, and then send them to the Office of Academic Affairs for settlement

Adding and Dropping Courses

In the first week of teaching, based on their timetables, ability and learning conditions, students can file for adding and dropping courses.

17.7. Academic suspension

Students violating one of the below regulation will be suspended academically:

- The ultimate time for studying has finished;
- To drop out of university more than one semester without approval of IU;
- Students are warned more than 2 times;

- Do not register courses for each semester;
- Do not finish tuition fees in the prescribed time.

17.8. Academic information

- Students can see all studying results in each semester and training results at the School of Computer Science and Engineering.
- In studying process, student can ask for student's transcript at the Office of Academic Affairs.
- For student who is warned or suspended, the university will send the information for student's family.

CLASSIFICATION	SCALE 0 OF 100	SCALE 0 OF 4	LETTER GRADE
PASS			
Excellent	85 ≤ GPA ≤ 100	4.0	А
Very Good	75 ≤ GPA < 85	3.75	A-
Good	65 ≤ GPA < 75	3.5	B+
Fairly good	60 ≤ GPA < 65	3.0	В
Fair	55 ≤ GPA < 60	2.5	C+
Average	50 ≤ GPA < 55	2.0	С
FAIL			
Weak	30 ≤ GPA < 50	1.3	D+
Rather weak	10 ≤ GPA < 30	1.0	D
Too weak	GPA < 10	0	F

17.9. Grading criteria

18. Faculty

 Assoc. Prof. Tran Manh Ha – Dean of School of Computer Science and Engineering Degree: PhD in Computer Science, Jacobs University Bremen, Bremen Email: <u>tmha@hcmiu.edu.vn</u>

Research Interest:

- Computer networks, network management, fault and security management,
- Distributed systems, distributed computing, P2P computing, mobile computing

Research funding received:

No	Project name	Funding institution &	Project	Position/ role in
NU	Project name	funded amount	duration	the project

1	Fault analysis and search on inter-cloud computing system	HCMC VNU, 50 millions	1 year (2014-2015)	PI
2	Knowledge-based supporting system for fault resolution on network and communication system	Nafosted, 641 millions	2 years (2011-2013)	PI
3	Improving nano ozone machine for civil and industrial waste-water treatment	IPP, 1000 millions	2 years (2012-2013)	PM

 Dr. Ha Viet Uyen Synh – Vice Dean of School of Computer Science and Engineering Degree: PhD in Computer Science, Sungkyunkwan University _ Korea, Korea Email: <u>hvusynh@hcmiu.edu.vn</u>

Research Interest:

- Computer Vision
- Image Processing
- Machine Learning

Research funding received:

No	Project name	Funding institution & funded amount	Project duration	Position/ role in the project
1	Researching video technologies in traffic monitoring system	International University, VNU HCMC	2014-2015	Principle investigator
2	Traffic Surveillance System for HCMC	The Committee's People of HCMC, Vietnam	2015-2017	Key researcher
3	Advanced Occlusion Detection Algorithm in Video Processing Applications	VNU HCMC	2016-2018	Principle investigator

 Dr. Nguyen Van Sinh – Lecturer of School of Computer Science and Engineering Degree: PhD in Computer Science, Aix-Marseille University, France Email: <u>nvsinh@hcmiu.edu.vn</u>

Research Interest:

- Geometric modeling, Computer graphics, Image processing

Research funding received:

No	Project name	Funding institution & funded amount	Project duration	Position/ role in the project
1	User Modeling in Social Network	Vietnam National University of HCMC	18 months	Member

		(B2010-28- 04/ÐHQGTPHCM)		
2	Constructing the model of triangular grid surface from 3D point clouds based on a fast search algorithm.	University (T2015-02- IT/HÐ-ÐHQT-)	12 months	Director
3	Reconstructing the surface of 3D point clouds by filling the holes	Vietnam National University of HCMC (C2016-28-07 HÐ/KHCN)	12 months	Director

 Dr. Vo Thi Luu Phuong – Lecturer of School of Computer Science and Engineering Degree: PhD in Computer Engineering, Kyung Hee University, Korea Email: <u>vtlphuong@hcmiu.edu.vn</u>

Research Interest:

- Resource allocation in computer networks;
- Network optimization;
- Wireless and mobile networks;
- Information-centric networks and cache-enabled networks;
- Multipath and congestion control protocols;
- HTTP-based Adaptive bitrate streaming.

Research funding received:

No	Project name	Funding institution & funded amount (million VND)	Project duration	Position/ role in the project
1	Performance Improvement of Multipath TCP Congestion Control Algorithms	102.02-2013.48, Nafosted, 20	10/2008 - 2/2009	Key researcher
2	Build the lab guides based on Cisco products sponsored by World Bank	01/08, International University, 584	2013 -2015	Principle investigator
3	Resource management optimization in cache- enabled mobile networks	102.02-2015.36, Nafosted, 50	05/2015 – 11/2016	Principle investigator
4	Optimizing the content placement in caching networks supporting adaptive bit-rate streaming	C2015-28-01/HÐ- KHCN, VNUHCM, 460	05/2016- 05/2018	Principle investigator

 Dr. Nguyen Thi Thanh Sang – Lecturer of School of Computer Science and Engineering Degree: PhD in Software Engineering, University of Technology, Sydney Email: <u>nttsang@hcmiu.edu.vn</u>

Research Interest:

One of my research interests is semantic recommender systems which can be developed by integrating Semantic Web technologies into Web mining. Some data mining techniques can be used to discover and process data, and build knowledge bases in the recommender systems. The main goal of this research is often to personalize the built knowledge in order to meet Web user interests. I am also interested in business intelligence applications which deal with the big data of user profile and transactions. Analysing user behaviour is usually concerned in such applications. Currently, I am researching recommender systems, search engines and expert systems. **Research funding received:**

No	Project name	Funding institution & funded amount	Project duration	Position/ role in the project
1	Combination of Naïve Bayes Classifier and Document Modelling in Web-page Recommendation	International University - Vietnam National University HCMC	04/2016- 04/2017	Supervisor
2	Building a Semantic Knowledge Base for Efficiently Searching Book	International University - Vietnam National University HCMC	06/2016- 06/2017	Project principal investigator
3	Modifying the CN2 Algorithm to Process Data Sets with Large Percentage of Missing Values	International University - Vietnam National University HCMC	11/2006- 07/2007	Member

Dr. Tran Thanh Tung– Lecturer of School of Computer Science and Engineering Degree: PhD in Computer Science, University of Bordeaux, France Email: <u>tttung@hcmiu.edu.vn</u>

Research Interest:

- Formal methods: verification of real-time systems
- Health information system

Research funding received:

No	Project name	Funding institution & funded amount	Project duration	Position/ role in the project
1	AVeRTS - Algorithmic Verification of Real-Time Systems - AVeRTS in an Indo-French project on the algorithmic verification of real-time systems	LaBRI, Bordeaux, France	2014-2016	Researcher

• Dr. Le Hai Duong– Lecturer of School of Computer Science and Engineering Degree: PhD in Network Security, Feng Chia University, Taiwan

Email: https://www.edu.vn

Research Interest:

- Network and computer security

- Cryptography

Research funding received:

No	Project name			Funding institution & funded amount	Project duration	Position/ role in the project
1	Authentication network	for	Wi-Fi	International University	1yr	Project manager

Dr. Nguyen Hong Quang– Lecturer of School of Computer Science and Engineering Degree: PhD in Computer Science, La Trobe University, Australia Email: <u>nhquang@hcmiu.edu.vn</u>

Research Interest:

- Invention & patent analysis, Intellectual Asset Management, Intellectual Property

- Data analytics/integration, ontology engineering, business intelligence, XML-related technologies

- Software engineering, system analysis and design, object-oriented modeling and programming

Research funding received:

No	Project name	Funding institution & funded amount	Project duration	Position/ role in the project
1	Aligning and analyzing Hemagglutinin sequences from Vietnam's influenza sources (Vietnamese: Sắp xếp và phân tích đặc tính các chuỗi Hemagglutinin ở Việt Nam) [Project ID: T2012-13-IT, Decision No.: 414/QĐ-ĐHQT- QHQT&QLKH, 30 Dec 2012]	International University VNUHCM, 40 million VND	30 months	Principal Investigator
2	Ontology-based Patent Information Retrieval (Vietnamese: Tìm kiếm thông tin sáng chế dựa trên Ontology) [Project ID: C2016-28-08/HĐ- KHCN, Decision No.: 69/QĐ-ĐHQG, 15 Feb 2016]	Vietnam National University HCMC, 80 million VND	24 months (04/2016 – 04/2018)	Principal Investigator

 Msc. Le Thanh Son– Lecturer of School of Computer Science and Engineering Degree: Msc in Networking, Korea Advanced Institute of Science and Technology, Korea Email: <u>ltson@hcmiu.edu.vn</u>

Research Interest:

- Networking
- Distributed Systems
- Mobile Application

Research funding received:

No	Project name	Funding institution & funded amount	Project duration	Position/ role in the project
1	Bug tracking and analyzing system for cloud computing and distributed system	VNU – HCM	2014 – 2015	Member
2	Knowledge-based bug tracking system for network and communication system	Nafosted	2011 – 2013	Member

 Msc. Dao Tran Hoang Chau– Lecturer of School of Computer Science and Engineering Degree: Msc in Computer Science and Entrepreneurship, University of Nottingham, UK Email: <u>dthchau@hcmiu.eu.vn</u>

Research Interest:

- Information Systems
- Social Network Analysis
- Recommender Systems
- Msc. Huỳnh Khả Tú Lecturer of School of Computer Science and Engineering Degree:

- MEng. in Electronics Engineering, Ho Chi Minh City University of Technology (HCMUT), 2002-2004

- BEng. in Electronical and Electronics Engineering, Ho Chi Minh City University of Technology(HCMUT),1996-2001

- BA. in English, Ho Chi Minh City University of Social Sciences and Humanities (HUSSH), 1998-2002

ResetInterest:

- Image Processing,
- Image Forensics
- Msc. LyTu Nga– Lecturer of School of Computer Science and Engineering Degree: Msc in Radio Engineering-Electronics, Ho Chi Minh University of Technology (HCMUT), Viet Nam Email: <u>ltnga@hcmiu.edu.vn</u>

Research Interest:

- Particle filter in wireless sensor networks
- Embed system.
- Localization.

Research funding received:

No	Project name	Funding institution & funded amount	Project duration	Position/ role in the project
1	Power-adaptivemethodbased on particle filter forimprovingpatientlocalizationappliedtelemedicine	International University – 30 million VNĐ	12 months	Leader-main researcher
2	Particle filtering based on the adaptive resampling analysis applied to wireless biomedical sensor networks	International University – 55 million VNĐ	18 months	Leader-main researcher
3	Monitor the Sea Buoy Status via SMS based on ARM Technology	International University – 28 million VNĐ	12 months	Leader-main researcher
4	DesignDigitalCommunicationLaboratorybasedonKitCommunicationLaboratoryof Telecommunications	International University – 30 million VNĐ	12 months	Leader-main researcher

 Msc. Nguyen Tien Dung– Lecturer of School of Computer Science and Engineering Degree: Msc in Information Technology Management, International University VNU HCMC, Viet Nam

Email: ntdung@hcmiu.edu.vn

Research Interest:

- Data mining

- Cloud computing
- Internet of Things

Research funding received:

No	Project name Funding institution & Project funded amount duration		Project duration	Position/ role in the project	
1	On Detecting Sensor Fault for Agricultural IoT System	30 000 000 VND	2016-2017	Principle Investigator	
2	CELAR: Automatic, Multi- grained Elasticity- provisioning for the Cloud	441 066 EUR	2012-2015	Project Assistant	

19. Degree Checklist

19.1. Computer science program

- **Degree:** Bachelor of Engineering
- Major: Computer Science
- Requirement for graduation: 149 credits
- Minimum GPA: 50.0

No.	Sub ID	Subject	Credit	Level	Grade	Equivalence Subject		
Requ	Required major course (78 credits)							
1	IT013IU	Data Structures and Algorithms	4					
2	IT017IU	Operating Systems	4					
3	IT058IU	Thesis	10					
4	IT064IU	Introduction to Computing	3					
5	IT067IU	Digital Logic Design	3					
6	IT069IU	Object-Oriented Programming	4					
7	IT076IU	Software Engineering	4					
8	IT079IU	Principles of Database Management	4					
9	IT082IU	Internship	3					
10	IT083IU	Special Study of the Field	3					
11	IT089IU	Computer Architecture	4					
12	IT090IU	Object-Oriented Analysis and Design	4					
13	IT091IU	Computer Networks	4					
14	IT093IU	Web Application Development	4					
15	IT094IU	Information System Management	4					
16	IT096IU	Net-Centric Programming	4					
17	IT099IU	Digital Logic Design Laboratory	1					
18	IT116IU	C/C++ Programming in Unix	4					
19	IT120IU	Entrepreneurship	3					
20	IT063IU	Theoretical Models in Computing	4					
Elect	Elective courses (12 credits): Students have to take 3 courses							
21	IT024IU	Computer Graphics	4					
22	IT044IU	Human-Computer Interaction	4					
23	IT056IU	Software Project Management	4					
24	IT097IU	Introduction to Artificial Intelligence	4					
25								
26	IT114IU	Software Architecture	4					
27	IT130IU	Digital Image Processing	4					

28	IT132IU	Introduction to Data Mining	4				
29	IT133IU	Mobile Application Development	4				
Engl	ish courses	(8 credits)					
30	EN007IU	Writing AE1	2				
31	EN008IU	Listening AE1	2				
32	EN011IU	Writing AE2	2				
33	EN012IU	Speaking AE2	2				
Mat	hematics co	urses (18 credits)	·				
34	MA001IU	Calculus 1	4				
35	MA003IU	Calculus 2	4				
36	MA023IU	Calculus 3	4				
37	MA020IU	Discrete Mathematics	3				
38	MA026IU	Probability, Statistic & Random	3				
		Process					
Cher	nistry & Phy	ysics courses (14 credits)					
39	CH011IU	Chemistry for Engineers	3				
40	CH012IU	Chemistry Laboratory	1				
41	PH013IU	Physics 1	2				
42	PH014IU	Physics 2	2				
43	PH015IU	Physics 3	3				
44	PH016IU	Physics 3 Laboratory	1				
45	PH012IU	Physics 4	2				
Polit	ical educati	on (10 credits)	·				
46	PE011IU	Principles of Marxism	5				
47	PE012IU	Ho Chi Minh's Thoughts	2				
48	PE013IU	Revolutionary Lines of Vietnamese	3				
		Communist Party					
Gene	eral educati	on (3 credits)					
49	PE008IU	Critical Thinking	3				
Phys	ical training	g (6 credits)					
50	PT001IU	Physical Training 1	3				
51	PT002IU	Physical Training 2	3				
Milit	Military training						

19.2. Network engineering program

- **Degree:** Bachelor of Engineering
- Major: Network Engineering
- **Requirement for graduation:** 149 credits
- Minimum GPA: 50.0

No.	Sub ID	Subject	Credit	Level	Grade	Equivalence
						Subject

Requ	Required major course (78 credits)					
1	IT013IU	Data Structures and Algorithms	4			
2	IT017IU	Operating Systems	4			
3	IT058IU	Thesis	10			
4	IT064IU	Introduction to Computing	3			
5	IT067IU	Digital Logic Design	3			
6	IT069IU	Object-Oriented Programming	4			
7	IT076IU	Software Engineering	4			
8	IT079IU	Principles of Database Management	4			
9	IT082IU	Internship	3			
10	IT083IU	Special Study of the Field	3			
11	IT089IU	Computer Architecture	4			
12	IT090IU	Object-Oriented Analysis and Design	4			
13	IT091IU	Computer Networks	4			
14	IT092IU	Principles of Programming Languages	4			
15	IT093IU	Web Application Development	4			
16	IT097IU	Introduction to Artificial Intelligence	4			
17	IT099IU	Digital Logic Design Laboratory	1			
18	IT116IU	C/C++ Programming in Unix	4			
19	IT120IU	Entrepreneurship	3			
20	IT063IU	Theoretical Models in Computing	4			
Elect	tive courses	(12 credits): Students have to take 3 co	ourses	<u>. </u>		
21	IT045IU	Network Design and Evaluation	4			
22	IT056IU	Software Project Management	4			
23	IT112IU	Introduction to Distributed	4			
		Computing				
24	IT117IU	System and Network Security	4			
25	IT122IU	Introduction to Wireless Network	4			
26	IT124IU	Network Management and Protocols	4			
27	IT125IU	System & Network Administration	4			
28	IT130IU	Digital Image Processing	4			
29	IT132IU	Introduction to Data Mining	4			
30	IT133IU	Mobile Application Development	4			
31	IT134IU	Internet of Things	4			
Engl	ish courses	(8 credits)		, , ,		
32	EN007IU	Writing AE1	2			
33	EN008IU	Listening AE1	2			
34	EN011IU	Writing AE2	2			
35	EN012IU	Speaking AE2	2			
Mat	hematics co	urses (18 credits)		,		
36	MA001IU	Calculus 1	4			

37	MA003IU	Calculus 2	4					
38	MA023IU	Calculus 3	4					
39	MA020IU	Discrete Mathematics	3					
40	MA026IU	Probability, Statistic & Random	3					
		Process						
Cher	nistry & Phy	ysics courses (14 credits)						
41	CH011IU	Chemistry for Engineers	3					
42	CH012IU	Chemistry Laboratory	1					
43	PH013IU	Physics 1	2					
44	PH014IU	Physics 2	2					
45	PH015IU	Physics 3	3					
46	PH016IU	Physics 3 Laboratory	1					
47	PH012IU	Physics 4	2					
Polit	ical educati	on (10 credits)	·					
48	PE011IU	Principles of Marxism	5					
49	PE012IU	Ho Chi Minh's Thoughts	2					
50	PE013IU	Revolutionary Lines of Vietnamese	3					
		Communist Party						
Gene	General education (3 credits)							
51	PE008IU	Critical Thinking	3					
Phys	Physical training (6 credits)							
52	PT001IU	Physical Training 1	3					
53	PT002IU	Physical Training 2	3					
Military training								