VIETNAM NATIONAL UNIVERSITY - HCMC
INTERNATIONAL UNIVERSITY

SCHOOL OF ELECTRICAL ENGINEERING

STUDENT HANDBOOK

2023

Program accredited by

ABET

AUN-QA
A Touch of Quality

CONTENT

Part 1: INTRODUCTION

Part 2: CURRICULUMS

PART 1: INTRODUCTION

I. Welcome To School Of Electrical Engineering (SEE)

You are now a part of the SEE with the coolest students, who are in many ways look like you!

You are all going to experience the most colorful part of your life!

Memory is always the most valuable thing in human life. The years studying at university are the memories that many people will usually look back and remember with joy. They are the years of hardship, enjoyment, friendship, challenges, sadness, etc. and it is all worth it!

University life is something very special. It is a time when you devote yourself to study.

Study at university is very different from your known high school study where you must spend many hours for self-study. At the university, you are going to learn the theory that you need in practice and have a lot of exams. It is important to find out the best method for you to learn and manage your time. Perhaps, in the beginning, you might get frightening, frustrating, and confusing school time you have ever met, but congratulation! You are now with the title of IU student and more specific EE-student. When you really are an EE student, do it with pride. Try different methods and find the study life that suits you.

Student life is fantastic! You can organize and enjoy party with your fellow students.

At university, you can study alone and win the medal at your graduation ceremony. However, you are recommended to study in a team/group. Your collaboration in the teamwork is important. Teamwork brings forth several advantages. It provides you with the opportunity to develop ideas and look at the problem from different perspective with the help of your fellow students. You learn how to participate in professional discussions, and practice your communicating skill with your partners. With effective teamwork, your team can support you and they can also receive help in return. You can see the world with an analytical approach which helps you to recognize problems, and gain knowledge of theories and methods for solutions. Ultimately, after four years studying at SEE-IU you will have experienced numerous projects, conflicts, theories, and successes.

Always, teamwork requires a lot of work, engagement, and the acceptance of the critiques. Teamwork can be sometimes hard and monotonous. So, remember to have fun during working with your team, and you may find friends for life if you have a positive teamwork's atmosphere.

Save time for enjoyment and keep in mind that the joyful moments are just as important as the professional ones. These moments that will let you enjoy your study life, and these are the moments you will remember for a very long time.

So, university life – student life is the time that you build the knowledge, friendships and memories that would be important later in life.

II. About The SEE

The field of electrical engineering is an engineering discipline which creates technologies for the human's purposes. The field is concerned with the study, design & application of equipment, devices & systems which use electricity, electronics, and electromagnetism, actually. Electrical engineering has played a great role in the applications in such fields as transportation, communication, aviation and aerospace, etc. Now, it is continuing to make essential contributions to society, creating unlimited innovations, such as robots, AI, IoT, smart home/city, and self-driving vehicles. Therefore, it is extremely important to gain a solid understanding of the fundamentals, in order to sustain interest when encountering complex theories and calculations later.

Founded in 2004, School of Electrical Engineering (SEE) was among the most distinguished and the earliest members of International University – Vietnam National University Ho Chi Minh city (IU - VNU HCMC). SEE is dedicated to providing strong engineering education in the fields of Electronics & Telecommunications Engineering as well as Control Engineering & Automation.

ET program received the assessment and accreditation of quality by AUN-DAAD in 2013, as well as accreditation by ABET (Accreditation Board for Engineering and Technology, United States) in 2019.

This success has firmed up our motivation and encourages us to pursue a higher level in research and teaching activities.

1. Vision of SEE

It is aimed to become the school with national and international recognition in advanced teaching methodology, state-of-the-art research, and innovation.

Advanced teaching methodology:

- ✓ Provide students with fundamental and advanced theories and link them to engineering application.
- ✓ Interact with students both inside and outside classrooms.
- ✓ Support students with blended teaching.
- ✓ Inspire students to engage in research and solve technical problems.

State-of-The-Art research:

- ✓ Build the modern laboratories involved in research areas of the school and foster students to join.
- ✓ Prepare the academic curriculum involved in research.

Innovation:

- ✓ Guide students to comprehend the social, economic, and technical contexts.
- ✓ Encourage students to recognize current and future problems.
- ✓ Teach students creative and critical thinking.
- ✓ Foster students to collaborate with others in solving integrated problems.

2. Missions of SEE

Being consistent with the mission of the IU – VNU HCMC, SEE aims to:

- ✓ Help students take the best advantage of their educational opportunities and prepare them with the necessary knowledge to be able to adapt to rapid changes in technology.
- ✓ Conduct high-quality research that benefits students, scholar and communities.
- ✓ Transfer technology to solve community problems and create strong collaboration with industry.

3. Student Outcomes of SEE

Graduates who have successfully completed the SEE-IU's program are prepared to enter a global workforce and possess these abilities (based on the ABET standard):

1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3) An ability to communicate effectively with a range of audiences.
4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

4. Career Opportunities

Students who graduate from SEE have great chances to:

- Work in domestic or foreign companies related to IC design, consumer electronics, information technology, and automation
- Develop start-up companies and introduce new electrical and communication products to the market
- Work in domestic or foreign communication/network corporations, mobile network, air freight companies
- Develop start-up companies and introduce new electrical and communication products to the market.

III. Academic Program

SEE offers three types of Undergraduate programs: the full-time program at IU, double degree programs, and the Twinning program between the IU and a foreign partner university (called 2+2 program). Details of these curricula are provided in the part II of this handbook. Besides, Graduate program (Master of Electrical Engineering) and the combined BS-MS program are also offered.

1. Undergraduate Programs

1.1. The Full Time Program

The full time program (study 4.5 years at IU, called IU program) consists of two specific options: (1) *Electronics and Telecommunications Engineering option* and (2) *Control Engineering & Automation option*. Both options lead to the "Engineer in Electronics and Telecommunications Engineering" degree and "Engineer in Control Engineering and Automation" degree, respectively. The degree is issued by IU – VNU, HCMC.

Every undergraduate IU program is the credit-based system which is conducted on a semester basis. SEE provides a solid foundation in core subjects, combined with General and EE elective courses. Students are required to complete at least 152 credits (including thesis) and take an English proficient examination to accomplish the program. In addition to these required credits, students have to take non-counting credits and extra-curriculum activities including two courses of Physical Training, Military Training.

The Electronics and Telecommunications Engineering (ET) undergraduate curriculum consists of four main blocks:

1. General Education (66 credits)
2. Core major requirement (33 credits)
3. Specialization requirement (34 credits)
4. Professional practice and research (19 credits)

The Control Engineering & Automation (AC) undergraduate curriculum also consists of four main blocks:

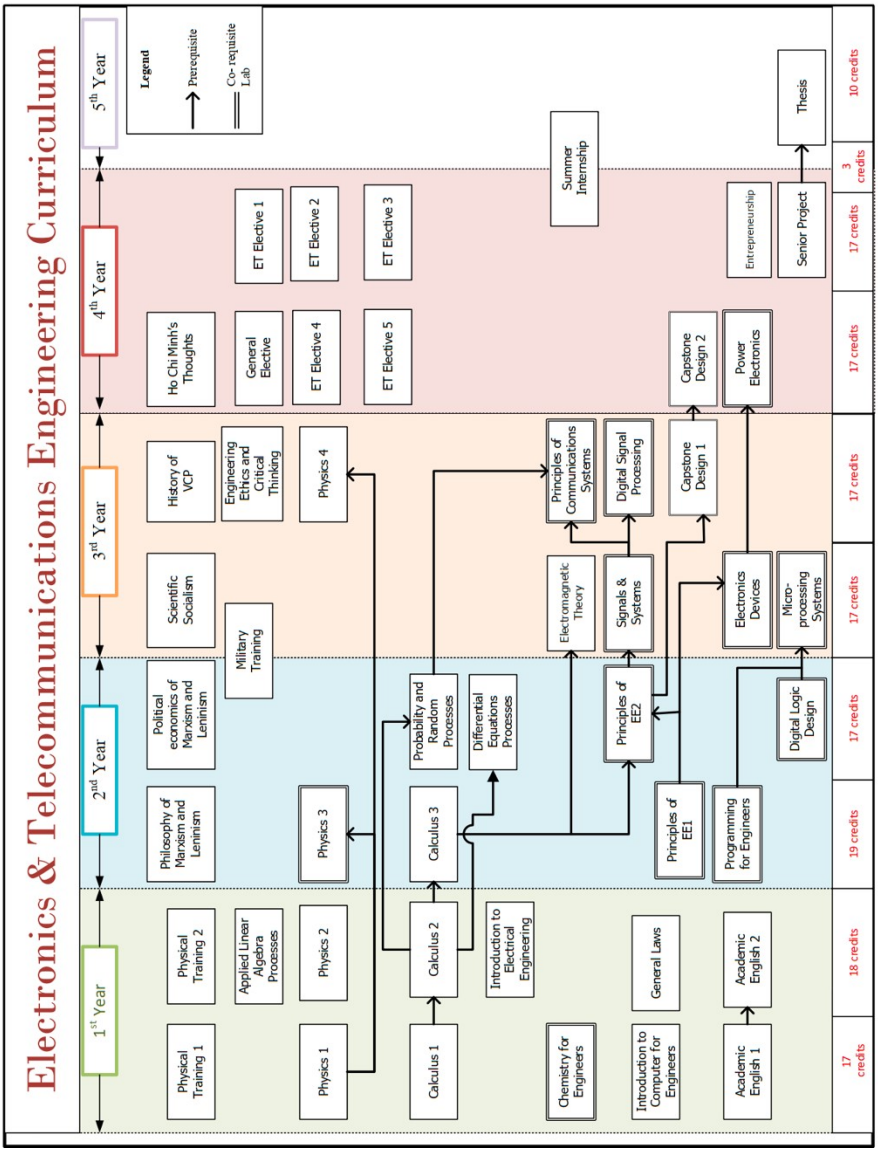
1. General Education (61 credits)
2. Core major requirement (33 credits)
3. Specialization requirement (39 credits)
4. Professional practice and research (19 credits)

Generally, in the third year of study, students have to choose one General elective course and at least five elective courses.

The four-year academic curriculum is built to adapt the students' intake English proficiency level with 4 options: ***Academic English***, ***Intensive English 2, Intensive English 1, Intensive English 0.*** For more details, you must read the part II of the handbook, carefully.

1.2. Curriculum Map of Electronics and Telecommunications Engineering

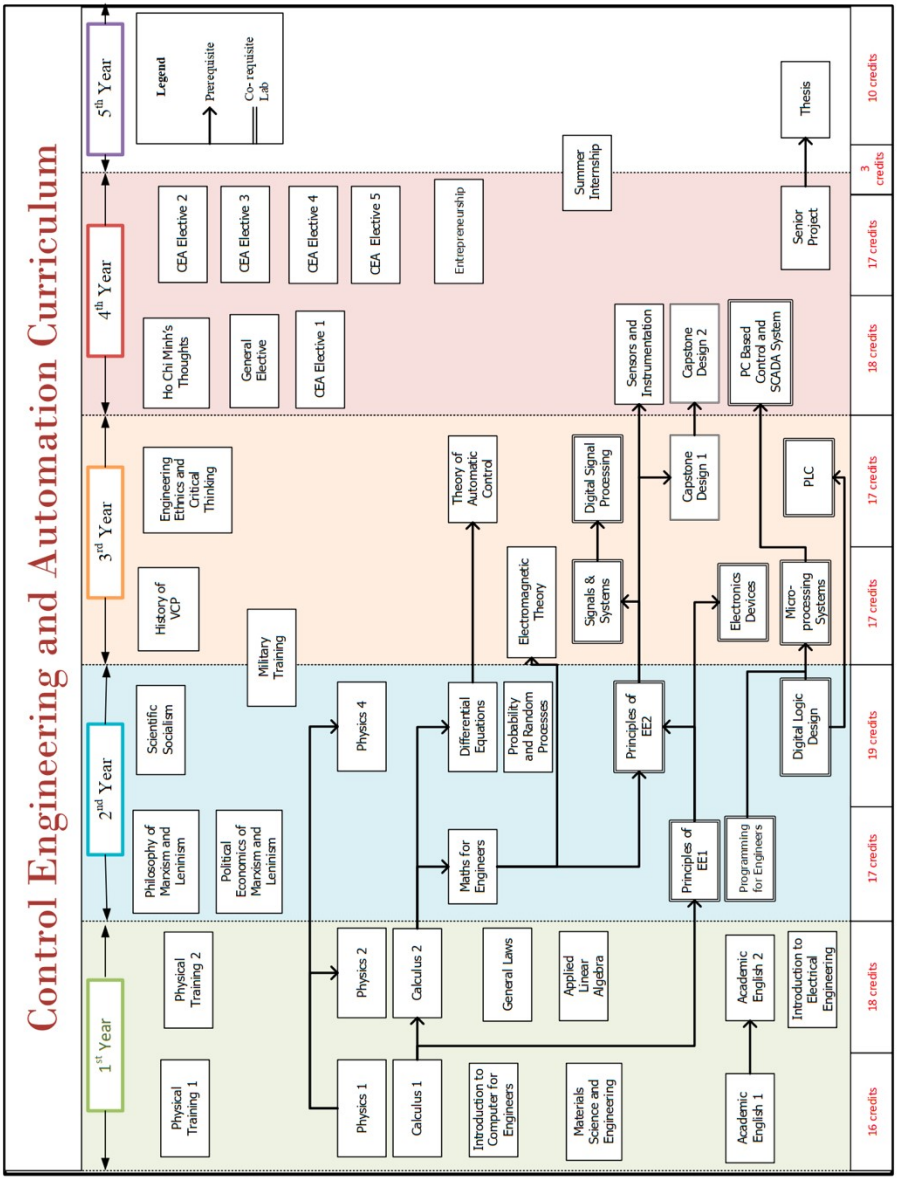
The curriculum map offers a quick summary of the main features of the ET curriculum with many pre-requisite requirements (arrow directions)



Note: Choices should be made with care, planning, and consultation with student's advisor.

1.3. Curriculum Map of Control Engineering & Automation

The curriculum map offers a quick summary of the main features of the AC curriculum with many pre-requisite requirements (arrow directions)



Note: Choices should be made with care, planning, and consultation with student's advisor.

1.4. Twinning Program

The Twinning program allows you to spend the first two years studying at the IU and the other two years at the partner universities. After completing the second phase and meeting all requirements from the partner universities, you will be awarded the Bachelor of Engineering Degree by the partner universities. For further information on requirements from the partner universities, please visit the Office of International Academic Collaboration.

Currently, we have only established the twinning program for Electronics and Telecommunications Engineering. They include:

- The twinning program with University of Nottingham, England.
- The twinning program with SUNY Binghamton, USA.
- The twinning program with University of West of England, England.

1.5. Double Degree Programs

The double degree programs allow a student to work toward two degrees simultaneously. It saves time and money as you get two degrees within a short span of time. SEE offers the following double degree programs:

1st degree	2nd degree
Electronics and Telecommunications	Control Engineering and Automation
Electronics and Telecommunications	Information Engineering
Electronics and Telecommunications	Biomedical Engineering
Control Engineering and Automation	Electronics and Telecommunications
Control Engineering and Automation	Biomedical Engineering
Control Engineering and Automation	Information Engineering

2. BS – MS Program

A special **bridging** program introduced by SEE-IU offers **engineering students** the opportunity to obtain the Master of electronics engineering within one and a half year **after the completion of undergraduate program**. Students who interested in the bridging program should review the BS-MS program. An application to the program should be filled in the Fall/Spring term of the junior year.

3. Master Program

SEE offers two Master programs (Coursework program and Research program). Students must spend about 2 years and choose to follow either of the two programs: coursework program or research program, including various specializations:

- Communications
- RF and Antenna
- Microelectronics
- Signal Processing
- Automation /Control
- Bio-medical Sensor and Devices

IV. ACADEMIC MATTERS

This section is to help and support you to have an enjoyable and effective learning experience.

1. Your Academic Advisors

Your Academic advisor will support you throughout your university life and is assigned based on your major. Academic advisor can help you to select courses for the next term and his/her signature is needed for many things, such as adding or dropping a course. He/she is also someone you can discuss, for your educational goals and create a plan of study to meet your intellectual interests and career goals. Your advisor can help to make sure you are meeting all of your graduation requirements. Therefore, it is principally your responsibility to know them.

The students belong to academic year 2023 - 2024 have the following assigned academic advisors:

Electronics and Telecommunications Engineering K23

M. Eng. Do Ngo Hung
Email: dnhung@hcmiu.edu.vn

Control Engineering and Automation K23 (IE2 and AE level)

M. Eng. Vo Minh Thanh
Email: vmthanh@hcmiu.edu.vn

Control Engineering and Automation K23 (IE0 and IE1 level)

Dr. Ton That Long
Email: ttlong@hcmiu.edu.vn

Twinning Program

Dr. Huynh Vo Trung Dung;
email: hvtdung@hcmiu.edu.vn

2. Hints to Become a Good and/or Great Electrical Engineer

a. Learn and understand the basic concepts of electricity thoroughly. Let the mathematical aspects of electrical and electronics engineering come naturally as you progress. The few but crucial concepts of electricity and electronic devices should be thoroughly understood, so that further advanced aspects of EE will be meaningful later on.

b. Study the other pre-requisites for engineering. These classes usually include physics and chemistry courses.

c. Attend open scientific seminars/conferences and read news from good sources such as http://science-technology.vn/ to find out more about what EE's do in their profession.

d. Study anything related to the field of electronics that appeals to you as a hobby. Hobbies can lead to a better understanding of how things work.

e. Join SEE-IU and get your Bachelor of Engineering Degree. To be an electrical engineer, you must be good at mathematics, science, and computers. Engineers also need to be good problem solvers and team members. If you are not sure whether you are fully interested in electrical engineering or not, taking a few courses such as Introduction to Electrical Engineering, and Introduction to Computer for Engineer that can help.

f. Survey the tracks of electrical engineering and sample each one to get an idea of where your interest lies. Explore the different directions you can advance with electrical engineering and choose the one that suits you the best. Narrow the field of possibility once you have sampled the various tracks. Then, make your own decision and concentrate all your efforts on the one area of work that has chosen by you.

g. Make sure you have something to show on your resume. Include why you think that you are the best for the job, including previous jobs and the amount of experience that you have with electrical engineering.

h. Always do your best and try to improve. Whether you are studying in university or on a full-time Electrical Engineering job, never give up without a good reason.

3. Student Email

International University collaborates with Microsoft to provide students with free email service. Please visit http://mail.office365.com and login using the following credentials:

Username: *<Student ID>*

Password: *<Provided by Center of Information Services>*

All students are required to use this email account when contacting our university.

4. Intake English Proficiency level

The four-and-a-half-year academic plan including 3 semesters is built to adapt the student's intake English proficiency level with three options: Academic English (for students who have the highest proficiency level.

- Intensive English 2 (with additional 13 non-counting credits in Intensive English 2.
- Intensive English 1 (with additional 17 non-counting credits in Intensive English 1 and Intensive English 2)
- Intensive English 0 (with additional 17 non-counting credits in Intensive English 0, Intensive English 1, and Intensive English 2)

5. Prerequisites

Student should **NOT** register a course if the needed prerequisite course(s) have not been taken. The student's advisor has the option of dropping a student from a course if he/she has not fulfilled the prerequisite requirements, even if the course has successfully been completed.

Curriculum Map or prerequisite chart to review the suggested schedule of courses with the required prerequisites for each course, please read carefully the prerequisite chart in this handbook.

6. Course Registration

In every semester, you have to do the course registration in which you select the subjects from the curriculum that are suitable to you. Be really careful with your selection because it may affect to your Personal Development plan as well as the final achievement of your degree.

Registration guidelines

- The registration time is informed by SEE.
- Make your own decision on the course selection
- Course registration can be completed online by using the university link https://hcmiu.edu.vn/edusoftweb/ (username and password will be created by the university)
- Register from a minimum of 12 credits (standard) to a maximum of 24 credits in one semester, except for the final semester (in 4th year)
- The subject registration must be approved by the academic advisors
- For exceptional cases, you can address the problems to Dean of SEE for consideration

7. Adjusting Student Timetable

You are responsible for checking the information shown in your timetable including the number of registered courses, tuition fees, etc… If you think that there is error in your

timetable, please report to the SEE Office. You can do it within three days since the announcement of timetable.

We will revise (through the academic advisors) your documents and give feedback to the problem. Then, we send the necessary documents to the Office of Undergraduate Academic Affairs (OUAA) for correction approval.

8. Adding and Dropping courses

In the first teaching week, based on the timetable, ability and learning conditions, you can choose to add or drop the courses online (https://hcmiu.edu.vn/edusoftweb/).

9. Grading Criteria and Assessment Methods

For the fundamental and specialized subjects of SEE:

- The theory subject has an assessment rate of 30% of the in-class score (including exercises, attendance, quizzes and teamwork), 30% of the midterm exam and 40% of the final exam;
- The laboratory subjects have a score rate of 70% of the in-class (including practical exercises, attendance, quizzes and teamwork) and 30% in the final exam.
- The summer internship, senior project, and graduation thesis: the assessment score will be based on the final grade of the advisor and the committee.

The classification of student's GPA will be graded as following:

CLASSIFICATION	SCALE 0 OF 100	SCALE 0 OF 4	LETTER GRADE
PASS			
Excellent	90 ≤ GPA ≤ 100	4.0	A
Very Good	80 ≤ GPA < 90	3.75	A-
Good	70 ≤ GPA < 80	3.5	B+
Fairly good	60 ≤ GPA < 70	3.0	B
Fair	55 ≤ GPA < 60	2.5	C+
Average	50 ≤ GPA < 55	2.0	C
FAIL			
Weak	30 ≤ GPA < 50	1.3	D+
Rather weak	10 ≤ GPA < 30	1.0	D
Too weak	GPA < 10	0	F

10. Specialization

After completing the first two years of the program, IU students are allowed to choose the specialization. Specialization is the research area which you want to continue in the thesis.

Specialization for ET program

- RF Design
- Internet of Things, Electronics & Embedded Systems
- Signal Processing
- Wireless Communications

Specialization for CEA Program

- Process control & Automation
- Robotics
- Control applications
- Visions & AI

The priority for specialization selection is based on student's GPA and the quota for each. Once the specialization is chosen, you have to take the required courses for each specialization, its relevant elective courses and the final thesis.

11. Summer Internship Registration

You are allowed to register for the summer internship only after you have achieved at least 110 credits (≥ 72% of total credits). Time for the registration is normally in the year before the academic year of writing the thesis. The internship requires a minimum of 8 weeks of full-time working. Students who have taken the summer internship in the past always obtain the following benefits after the completion:

- Form a relationship with people in the industry.
- Gain industrial experiences and knowledge which would benefit to the thesis in the final year.
- Address the current challenges in the industry and know how to overcome these challenges.
- Understand personal responsibility and team responsibility.

12. Thesis Registration

You have to register for the senior project before the thesis. In order to take the senior project, you must have successfully completed 110 credits.

Any student who wants to register for the thesis must meet the following conditions:

- Accumulate successfully at least 90% of total credits in the curriculum.

- Finish the senior project.
- Not under any academic admonishment.
- After the successful registration, you have 12 weeks (in minimum) to finish and submit your thesis.

13. Graduation Criteria

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

- Fully complete the curriculum (152 credits) with GPA ≥ 50
- Obtain the minimum English proficiency: TOEFL iBT score of 61; IELTS score of 5.5 overall; TOEIC (4 skills) score of 600 (Listening + Reading) and 270 (Speaking + Writing); Cambridge Exam (First FCE); BEC (Business Vantage); BULATS score of 60.
- Obtain Military Education Certification
- Meet other requirements in accordance with the regulations for graduation set by the IU

14. Transfer Credits

Certain courses can be taken at other universities and the credits can be transferred to IU. The transfer credits are not computed into a student's grade point average. However, if the grade is C or better, it does satisfy the requirement. An application must be filled out and approved by the SEE first and then OUAA before a course is taken elsewhere.

15. Academic Dishonesty

The department expects each student to conduct himself/herself in a professional manner. Cheating offenses are reported to the appropriate academic office by the SEE without hesitation. An engineer beginning a career cannot afford to have this kind of incident on record. Both the student who gives information and the one who receives it are considered guilty parties. The University policy on academic dishonesty is carefully spelled out in the undergraduate catalog. Note that copying from, or giving assistance to others, or using forbidden material on any exam or in any required report, is a violation. The recommended sanction is suspension from the University for one or more terms with a notation of academic disciplinary suspension placed on the student's transcript.

16. Academic Probation

The University Academic Committee normally arranges two meetings, after the Fall and Summer sessions annually, for academic matters. Any student who encounters one of the following issues will be taken into consideration during this time.

- Insufficient credits as required by the specialization in one semester
- The cumulative GPA < 35
- Two consecutive cumulative GPA < 50

After the meeting, the decision of admonishment will be informed to the students. Notice that the duration for academic probation will be valid in the next main semester (Summer session does not count).

17. Academic Suspension

Any student who is in **one of the below cases** will be asked to suspense his/her study temporarily:

- The time limit for study is overdue
- Drop out university more than one semester without the approval of IU
- Have been admonished more than 2 times
- Not register to any course for each semester
- Have not paid the tuition fees on time

18. Student Organizations

Participation in Student Organizations is not only a nice way for you to practice your soft skills in any circumstances, but also to polish your skills, and expand your network. More information will be covered in your Orientation.

The Youth Union & Student Union of SEE

The EE Youth Union & *EE Student Union* have always been the connecting bridge between students in the school; provides various practical information to the students such as course registration schedules, scholarships, recruitment, seminars, summer internships, extracurricular activities as well as volunteer activities.

Student Clubs - Societies

IU has dozens student-run clubs, such as: Soft Skills Club, Social Work Team, English Club, IU Buddy, etc. Through student clubs, you are going to have great opportunities to improve your competencies, widen your knowledge and soul. If you are interested in founding or joining a club or society, there are many ways the IU Office of Student Services can help get your ideas to take off. Instructions on creating a new club & running your own event on campus can be found here: http://iuoss.com/

E-Tech Club is an official academic club belonging to the Electrical Engineering Youth Union. E-Tech Club is responsible for supporting students through the courses' collective projects and various school-wise academic competitions; help students utilizing their accumulated knowledge during the lecture hours and put into practice.
Fanpage Youth Union:
https://www.facebook.com/ElectricalEngineeringYouthUnion/
***Fanpage Etechclub*:**
https://www.facebook.com/groups/etechclub/
Email:
eeyouthunion@iuyouth.edu.vn

19. SEE Alumni

SEE Alumni keeps alumni in touch with news from SEE and from other alumni. The Alumni Group facilitates networking, social events, reunions, and aims to serve as a connecting bridge between generations of students. It does not matter where you are located or what you are doing, you are still part of our global alumni family and we would love to hear from you.

Currently, Dr. Vuong Quoc Bao is the president of our group.

Vuong, Quoc Bao (K10)

EE Graduate – 2014
Received M.Eng in 2017 at IU and Ph.D. in 2022 at Brest, France.
Since 2022 until now: works at SEE-IU as assistant professor.
Email: vqbao@hcmiu.edu.vn

Huynh, Tan Quoc (K05)

EE Graduate - 2010
Received M.Eng in 2013 at IU and Ph.D. in 2019 at CUA, US.
Since 2019 until now: works at SEE-IU as assistant professor.
Email: htquoc@hcmiu.edu.vn

Bui, Bich Tram (K07)

EE Graduate – 2011
Since then, she works at SEE-IU as School of EE's Secretary.
Email: bbtram@hcmiu.edu.vn

Please contact any group member through the provided email addresses for more details on job opportunities!

PART 2: CURRICULUM INFORMATION

I. SEE Curriculums and Related Information

School of Electrical Engineering has four curriculum program distributions which are based on the English proficiency levels of students when they apply the program.

Level	IELTS	TOEFL iBT
Academic English 1 (AE1)	≥ 5.5	≥ 61
Intensive English 2 (IE2)	5.0	46-60
Intensive English 1 (IE1)	4.5	35-45
Intensive English 0 (IE0)	≤ 4	≤ 34

1. Electronics & Telecommunications Engineering Program

1.1. ET Program at IU

a. ET Program for AE1 Level

The ET Program for AE1 level is shown as follows.

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
PH013IU	Physics 1 (Mechanics)	2	MA027IU	Applied Linear Algebra	2
CH011IU	Chemistry for Engineers	3	PH014IU	Physics 2 (Thermodynamics)	2
CH012IU	Chemistry Laboratory	1	PE021IU	General Laws	3
EN007IU	Writing AE1	2	EN011IU	Writing AE 2	2
EN008IU	Listening AE1	2	EN012IU	Speaking AE2	2
EE050IU	Intro to Computer for Engineers	3	EE049IU	Introduction to EE	3
PT001IU	Physical Training 1	0	PT002IU	Physical Training 2	0
Total Credits		17	*Total Credits*		18
Summer Session					
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
MA023IU	Calculus 3	4	MA024IU	Differential Equations	4

PH015IU	Physics 3 (Electricity & Magnetism)	3	MA026IU	Probability& Random Process	3
PH016IU	Physics 3 Lab	1	EE055IU	Principles of EE 2	3
EE051IU	Principles of EE 1	3	EE056IU	Principles of EE 2 Lab	1
EE052IU	Principles of EE 1 Lab	1	EE053IU	Digital Logic Design	3
EE057IU	Programming for Engineers	3	EE054IU	Digital Logic Design Lab	1
EE058IU	Programming for Engineers Lab	1	PE016IU	Political economics of Marxism and Leninism	2
PE015IU	Philosophy of Marxism and Leninism	3			
Total Credits		19	*Total Credits*		17
Summer Session					
	Military Training				
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE088IU	Signals & Systems	3	EE092IU	Digital Signal Processing	3
EE089IU	Signals & Systems Lab	1	EE093IU	Digital Signal Processing Lab	1
EE083IU	Micro-processing Systems	3	EE068IU	Principles of Com. Systems	3
EE084IU	Micro-processing Systems Lab	1	EE115IU	Principles of Com. Systems Lab	1
EE010IU	Electromagnetic Theory	3	EE130IU	Capstone Design 1	2
PE017IU	Scientific socialism	2	PH012IU	Physics 4 (Optics & Atomics)	2
EE090IU	Electronics Devices	3	PE---IU	Engineering Ethics and Critical Thinking	3
EE091IU	Electronics Devices Lab	1	PE018IU	History of Vietnamese Communist Party	2
Total Credits		17	*Total Credits*		17
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE131IU	Capstone Design 2	2	EE107IU	Senior Project	2
EE079IU	Power Electronics	3	EE—IU	EE Elective Course 03	4
EEAC003IU	Power Electronics Lab	1	EE—IU	EE Elective Course 04	4
XX---IU	General Elective	3	EE—IU	EE Elective Course 05	4
PE019IU	Ho Chi Minh's Thoughts	2	EE114IU	Entrepreneurship	3

EE—IU	EE Elective Course 01	3			
EE—IU	EE Elective Course 02	3			
Total Credits		17	*Total Credits*		17
Summer Session					
EE112IU	Summer Internship	3			
Senior Year (5th year)					
Semester 1					
EE097IU	Thesis	10			
Total Credits		10			

Total: 152 credits

b. ET Program for IE2 Level

The EE Program for IE2 level is shown as follows.

Freshman Year (1st year)					
Semester 1			*Semester 2*		
			MA001IU	Calculus 1	4
			PH013IU	Physics 1 (Mechanics)	2
	IE2		CH011IU	Chemistry for Engineers	3
PT001IU	Physical Training 1	0	CH012IU	Chemistry for Engineers Lab	1
			EN007IU	Writing AE1	2
			EN008IU	Listening AE1	2
			EE049IU	Introduction to EE	3
			PE021IU	General Laws	3
			PT002IU	Physical Training 2	0
Total Credits		0	*Total Credits*		20
Summer Session					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
MA003IU	Calculus 2	4	EN012IU	Speaking AE2	2
Total Credits					10
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
MA023IU	Calculus 3	4	MA024IU	Differential Equations	4
EE050IU	Intro to Computer for Engineers	3	EE055IU	Principles of EE 2	3
EE051IU	Principles of EE 1	3	EE056IU	Principles of EE 2 Lab	1

EE052IU	Principles of EE 1 Lab	1	EE053IU	Digital Logic Design	3
MA027IU	Applied Linear Algebra	2	EE054IU	Digital Logic Design Lab	1
EE057IU	Programming for Engineers	3	PE015IU	Philosophy of Marxism and Leninism	3
EE058IU	Programming for Engineers Lab	1	PH015IU	Physics 3 (Electricity & Magnetism)	3
			PH016IU	Physics 3 Lab	1
Total Credits		17	*Total Credits*		19
Summer Session					
Military Training					
Total Credits					0
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE088IU	Signals & Systems	3	EE092IU	Digital Signal Processing	3
EE089IU	Signals & Systems Lab	1	EE093IU	Digital Signal Processing Lab	1
EE083IU	Micro-processing Systems	3	EE068IU	Principles of Com. Systems	3
EE084IU	Micro-processing Systems Lab	1	EE115IU	Principles of Com. Systems Lab	1
EE010IU	Electromagnetic Theory	3	EE130IU	Capstone Design 1	2
PE016IU	Political economics of Marxism and Leninism	2	EE090IU	Electronics Devices	3
MA026IU	Probability& Random Process	3	EE091IU	Electronics Devices Lab	1
			PE017IU	Scientific socialism	2
			PH012IU	Physics 4 (Optics & Atomics)	2
Total Credits		16	*Total Credits*		18
Summer Session					
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE131IU	Capstone Design 2	2	EE107IU	Senior Project	2
EE079IU	Power Electronics	3	EE—IU	EE Elective Course 02	4

EEAC003 IU	Power Electronics Lab	1	EE—IU	EE Elective Course 03	3
PE018IU	History of Vietnamese Communist Party	2	EE—IU	EE Elective Course 04	3
XX---IU	General Elective	3	PE019IU	Ho Chi Minh's Thoughts	2
EE114IU	Entrepreneurship	3	PE--IU	Engineering Ethics and Critical Thinking	3
EE—IU	EE Elective Course 01	4			
Total Credits		18	*Total Credits*		17
Summer Session					
EE112IU	Summer Internship	3			
Senior Year (5th year)					
Semester 1			*Semester 2*		
EE097IU	Thesis	10			
EE—IU	EE Elective Course 05	4			
Total Credits		14	*Total Credits*		

Total: 152 credits

c. ET Program for IE1 Level

The EE Program for IE1 level is shown as follow**.**

Freshman Year (1st year)					
Semester 1			*Semester 2*		
			MA001IU	Calculus 1	4
	IE1		PH013IU	Physics 1 (Mechanics)	2
	IE2		CH011IU	Chemistry for Engineers	3
			CH012IU	Chemistry for Engineers Lab	1
			EN007IU	Writing AE1	2
			EN008IU	Listening AE1	2
			EE049IU	Introduction to EE	3
			PE021IU	General Laws	3
			PT001IU	Physical Training 1	0
Total Credits		0	*Total Credits*		20
Summer Session					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
MA003IU	Calculus 2	4	EN012IU	Speaking AE2	2

Total Credits					10
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
MA023IU	Calculus 3	4	MA024IU	Differential Equations	4
EE050IU	Intro to Computer for Engineers	3	EE055IU	Principles of EE 2	3
EE051IU	Principles of EE 1	3	EE056IU	Principles of EE 2 Lab	1
EE052IU	Principles of EE 1 Lab	1	EE053IU	Digital Logic Design	3
MA027IU	Applied Linear Algebra	2	EE054IU	Digital Logic Design Lab	1
EE057IU	Programming for Engineers	3	PE015IU	Philosophy of Marxism and Leninism	3
EE058IU	Programming for Engineers Lab	1	PH015IU	Physics 3 (Electricity & Magnetism)	3
PT002IU	Physical Training 2	0	PH016IU	Physics 3 Lab	1
Total Credits		17	*Total Credits*		19
Summer Session					
Military Training					
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE088IU	Signals & Systems	3	EE092IU	Digital Signal Processing	3
EE089IU	Signals & Systems Lab	1	EE093IU	Digital Signal Processing Lab	1
EE083IU	Micro-processing Systems	3	EE068IU	Principles of Com. Systems	3
EE084IU	Micro-processing Systems Lab	1	EE115IU	Principles of Com. Systems Lab	1
EE010IU	Electromagnetic Theory	3	EE130IU	Capstone Design 1	2
PE016IU	Political economics of Marxism and Leninism	2	EE090IU	Electronics Devices	3
MA026IU	Probability& Random Process	3	EE091IU	Electronics Devices Lab	1
			PE017IU	Scientific socialism	2
			PH012IU	Physics 4 (Optics & Atomics)	2
Total Credits		16	*Total Credits*		18

Summer Session					
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE131IU	Capstone Design 2	2	EE107IU	Senior Project	2
EE079IU	Power Electronics	3	EE—IU	EE Elective Course 02	4
EEAC003 IU	Power Electronics Lab	1	EE—IU	EE Elective Course 03	3
PE018IU	History of Vietnamese Communist Party	2	EE—IU	EE Elective Course 04	3
XX---IU	General Elective	3	PE019IU	Ho Chi Minh's Thoughts	2
EE114IU	Entrepreneurship	3	PE--IU	Engineering Ethics and Critical Thinking	3
EE—IU	EE Elective Course 01	4			
Total Credits		18	*Total Credits*		17
Summer Session					
EE112IU	Summer Internship	3			
Senior Year (5th year)					
Semester 1			*Semester 2*		
EE097IU	Thesis	10			
EE—IU	EE Elective Course 05	4			
Total Credits		14	*Total Credits*		

Total: 152 credits

d. ET Program for IE0 Level

The EE Program for IE0 level is shown as follow**.**

Freshman Year (1st year)					
Semester 1			*Semester 2*		
	IE0			IE2	0
	IE1		PT001IU	Physical Training 1	0
Total Credits		0	*Total Credits*		0
Summer Session					
MA001IU	Calculus 1	4	EN007IU	Writing AE1	2
PH013IU	Physics 1 (Mechanics)	2	EN008IU	Listening AE1	2
Total Credits					10
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
MA003IU	Calculus 2	4	EE049IU	Introduction to EE	3
PH014IU	Physics 2 (Thermodynamics)	2	MA027IU	Applied Linear Algebra	2

EN011IU	Writing AE 2	2	MA026IU	Probability& Random Process	3
EN012IU	Speaking AE2	2	EE051IU	Principles of EE 1	3
EE050IU	Intro to Computer for Engineers	3	EE052IU	Principles of EE 1 Lab	1
CH011IU	Chemistry for Engineers	3	MA023IU	Calculus 3	4
CH012IU	Chemistry for Engineers Lab	1	PH015IU	Physics 3 (Electricity & Magnetism)	3
PE021IU	General Laws	3	PH016IU	Physics 3 Lab	1
PT002IU	Physical Training 2	0			
Total Credits		20	*Total Credits*		20
Summer Session					
Military Training					
Total Credits					0
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE053IU	Digital Logic Design	3	EE083IU	Micro-processing Systems	3
EE054IU	Digital Logic Design Lab	1	EE084IU	Micro-processing Systems Lab	1
EE057IU	Programming for Engineers	3	EE088IU	Signals & Systems	3
EE058IU	Programming for Engineers Lab	1	EE089IU	Signals & Systems Lab	1
MA024IU	Differential Equations	4	EE130IU	Capstone Design 1	2
EE055IU	Principles of EE 2	3	EE090IU	Electronics Devices	3
EE056IU	Principles of EE 2 Lab	1	EE091IU	Electronics Devices Lab	1
PH012IU	Physics 4 (Optics & Atomics)	2	PE015IU	Philosophy of Marxism and Leninism	3
			EE010IU	Electromagnetic Theory	3
Total Credits		18	*Total Credits*		20
Summer Session					
PE018IU	History of Vietnamese Communist Party	2	PE016IU	Political economics of Marxism and Leninism	2
Total Credits					4
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE131IU	Capstone Design 2	2	EE107IU	Senior Project	2

PE017IU	Scientific socialism	2	EE—IU	ET Elective Course 01	4
EE092IU	Digital Signal Processing	3	EE—IU	ET Elective Course 02	3
EE093IU	Digital Signal Processing Lab	1	EE—IU	ET Elective Course 03	3
EE079IU	Power Electronics	3	EE114IU	Entrepreneurship	3
EEAC003 IU	Power Electronics Lab	1	PE--IU	Engineering Ethics and Critical Thinking	3
	General Elective	3	PE019IU	Ho Chi Minh's Thoughts	2
EE068IU	Principles of Com. Systems	3			
EE115IU	Principles of Com. Systems Lab	1			
Total Credits		19	*Total Credits*		20
Summer Session					
EE112IU	Summer Internship	3			
Total Credits		3			
Senior Year (5th year)					
Semester 1					
EE097IU	Thesis	10			
EE—IU	ET Elective Course 04	4			
EE—IU	ET Elective Course 05	4			
Total Credits		18			

Total: 152 credits

(*) List of General Elective Courses

These electives give SEE's student the opportunity to explore any intellectual area. This freedom plays a critical role in helping students to define minor concentrations in areas such as bioengineering, technology and management, languages, or other engineering schools. You must take at least 01 course from the following list.

Sub ID	Subjects	Credit(s)
BA003IU	Principles of Marketing	3
BA006IU	Business Communication	3
BA027IU	E-Commerce	3
BA098IU	Leadership	3
BA117IU	Introduction to Micro Economics	3
BA120IU	Business Computing Skills	3
ENEE1001IU	Engineering Drawing	3 (2 + 1 lab)
PE014IU	Environmental Science	3
ENEE2008IU	Environmental Ecology	3
CE103IU+04	Computer-Aided Design and Drafting (CADD)+Practice CADD	3+1
CE211IU	Hydrogoly-Hydraulics	3
IT069IU	Object-Oriented Programming	3
BM030IU	Machine Design	3
IS085IU	CAD/CAM/CNC	3 (2 + 1 lab)
IS019IU	Production Management	3
IS034IU	Product Design & Development	3
IS040IU	Management Information System	3
IS065IU	Supply Security and Risk Management	3
PH027IU	Earth observation and the environment	3
PH018IU	Introduction to Space Engineering	3
PH035IU	Introduction to Space Communications	3
PH036IU	Remote Sensing	3
PH037IU	Space Environment	3
PH040IU	Satellite Technology	3
EL017IU	Language and Culture	3
EL018IL	Cross-Cultural Communication	3
EL021IL	Global Englishes	3
EEAC014IU	Neuron Network and Fuzzy Logics	3
ENEE2001IU	Introduction to Environmental Engineering	3

(**) List of ET Elective Courses

These courses are chosen by the school's Board. The elective requirement gives each student freedom to define a technical course of study in electrical engineering. Choices should be made with care, planning, and consultation with student's advisor. You have to take at least 5 courses (or equivalent to 18 credits in total) from the following list

Sub ID	Subjects	Credit(s)
EE061IU EE062IU	Analog Electronics Analog Electronics Laboratory	3 1
EE094IU EE095IU	Digital Electronics Digital Electronics Laboratory	3 1
EE105IU EE124IU	Antenna and Microwave Engineering Antenna and Microwave Engineering Lab	3 1
EE075IU	Theory of Automatic Control	3
EEAC020IU	Theory of Automatic Control	4
EE063IU EE117IU	Digital System Design Digital System Design Lab	3 1
EE066IU EE121IU	VLSI Design VLSI Design Lab	3 1
EE104IU EE118IU	Embedded Real-time Systems Embedded Real-time Systems Lab	3 1
EE070IU EE116IU	Wireless Communications Systems Wireless Communications Systems Lab	3 1
EE119IU EE120IU	Telecommunication Networks Telecommunication Networks Lab	3 1
EE072IU	Computer and Communication Networks	3
EE102IU	Stochastic Signal Processing	3
EE103IU EE122IU	Image Processing and Computer Vision Image Processing and Computer Vision Lab	3 1
EE123IU	Special Topics in Electrical Engineering	2
EE074IU	Digital Signal Processing Design	3
EE125IU EE126IU	RF Circuit Design RF Circuit Design Lab	3 1
EEAC008IU	Sensors and Instrumentation	3
EE127IU	Machine learning and Artificial Intelligence	3
EE128IU	Internet of Things (IoT)	3
EE129IU	Internet of Things Lab (IoT Lab)	1
EE133IU	Emerging Engineering Technologies	3

1.2. Twining programs

a. University of Nottingham, England

This program has the curriculum distribution as follows.

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001UN	Calculus 1	4	MA003UN	Calculus 2	4
PH013UN	Physics 1 (Mechanics)	2	MA027UN	Applied Linear Algebra	2
CH011UN	Chemistry for Engineers	3	PH014UN	Physics 2 (Thermodynamics)	2
CH012UN	Chemistry Laboratory	1	PE008UN	Critical Thinking	3
EN007UN	Writing AE1	2	EN011UN	Writing AE2	2
EN008UN	Listening AE1	2	EN012UN	Speaking AE2	2
EE050UN	Intro to Computer for Engineers	3	EE049UN	Introduction to EE	3
Total Credits		17	*Total Credits*		18
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
MA023UN	Calculus 3	4	MA024UN	Differential Equations	4
PH015UN	Physics 3	3	MA026UN	Probability& Random Process	3
PH016UN	Physics 3 Laboratory	1	PH012UN	Physics 4	2
EE051UN	Principles of EE 1	3	EE055UN	Principles of EE 2	3
EE052UN	Principles of EE 1 Lab	1	EE056UN	Principles of EE 2 Laboratory	1
EE053UN	Digital Logic Design	3	EE090UN	Electronic Devices	3
EE054UN	Digital Logic Design Laboratory	1	EE091UN	Electronic Devices Laboratory	1
EE057UN	Programming for Engineers (C)	3	EE010UN	Electromagnetic Theory	3
EE058UN	Programming for Engineers Lab	1			
Total Credits		20	*Total Credits*		20

Total credits taken at IU for 2 years: 75 credits

❖ **Transfer Conditions**

- Finish the first 2 years at International University, Vietnam National University, HCM with accumulated GPA ≥ 60/100
- Acquire an IELTS score of 6.0 overall (with constituent scores ≥ 5.5)
- Transfer time: September (*www.nottingham.ac.uk*)

b. University of West of England, England

This program has the curriculum distribution as follows.

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001WE	Calculus 1	4	MA002WE	Calculus 2	4
PH013WE	Physics 1 (Mechanics)	2	MA027WE	Applied Linear Algebra	2
CH011WE	Chemistry for Engineers	3	PH014WE	Physics 2 Thermodynamics)	2
CH012WE	Chemistry Laboratory	1	PE009WE	Critical Thinking	3
EN007WE	Writing AE1	2	EN011WE	Writing AE2	2
EN008WE	Listening AE1	2	EN012WE	Speaking AE2	2
EE050WE	Intro to Computer for Engineers	3	EE049WE	Introduction to EE	3
Total Credits		17	*Total Credits*		18
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
MA023WE	Calculus 3	4	MA024WE	Differential Equations	4
PH015WE	Physics 3	3	MA013WE	Probability& Random Process	3
PH016WE	Physics 3 Laboratory	1	PH012WE	Physics 4	2
EE051WE	Principles of EE 1	3	EE055WE	Principles of EE 2	3
EE052WE	Principles of EE 1 Lab	1	EE056WE	Principles of EE 2 Laboratory	1
EE053WE	Digital Logic Design	3	EE010WE	Electromagnetic Theory	3
EE054WE	Digital Logic Design Lab	1		General Electives	3
EE057WE	Programming for Engineers (C)	3			
EE058WE	Programming for Engineers Lab	1			
Total Credits		20	*Total Credits*		19

Total credits taken at IU for 2 years: 74 credits

❖ **Transfer Conditions**

- Finish the first 2 years at International University with accumulated GPA ≥ 50/100
- Acquire an IELTS score of 6.0 overall (with constituent scores ≥ 5.5)
- Transfer time: September (*www.uwe.ac.uk)*

c. SUNY Binghamton, USA

This program has the curriculum distribution as follows.

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001SB	Calculus 1	4	MA003SB	Calculus 2	4
PH013SB	Physics 1 (Mechanics)	2	MA027SB	Applied Linear Algebra	2
CH011SB	Chemistry for Engineers	3	PH014SB	Physics 2 (Thermodynamics)	2
CH012SB	Chemistry Laboratory	1	PE008SB	Critical Thinking	3
EN007SB	Writing AE1	2	EN011SB	Writing AE2	2
EN008SB	Listening AE1	2	EN012SB	Speaking AE2	2
EE050SB	Intro to Computer for Engineers	3	EE049SB	Introduction to EE	3
PT001SB	Physical Training 1	3	PT002SB	Physical Training 2	3
Total Credits		20	*Total Credits*		21
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
MA023SB	Calculus 3	4	MA024SB	Differential Equations	4
PH015SB	Physics 3	3	MA026SB	Probability& Random Process	3
PH016SB	Physics 3 Laboratory	1	PH012SB	Physics 4	2
EE051SB	Principles of EE 1	3	EE055SB	Principles of EE 2	3
EE052SB	Principles of EE 1 Lab	1	EE056SB	Principles of EE 2 Laboratory	1
EE053SB	Digital Logic Design	3	EE083SB	Microprocessor Systems	3
EE054SB	Digital Logic Design Laboratory	1	EE084SB	Microprocessor Systems Lab	1
EE057SB	Programming for Engineers (C)	3			

EE058SB	Programming for Engineers Lab	1			
Total Credits		20	*Total Credits*		17

Total credits taken at IU for 2 years: 78 credits

❖ **Transfer Conditions**

- Finish the first 2 years at International University, VNU, HCM with accumulated GPA ≥ 3.0/4.0
- Acquire a TOEFL iBT ≥ 80 or IELTS score of 6.5 overall (with constituent scores ≥ 5.5)
- Transfer time: September (*www.binghamton.edu*)

2. Control Engineering & Automation Program – CEA Program

Similar to above English criteria of ET program, the CEA Program is also designed with four English proficiency levels: AE1, IE2, IE1, and IE0.

a. CEA Program for AE1 Level

The CEA Program for AE1 level is shown as follows

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
PH013IU	Physics 1 (Mechanics)	2	PH014IU	Physics 2 (Thermodynamics)	2
EN007IU	Writing AE1	2	MA027IU	Applied Linear Algebra	2
EN008IU	Listening AE1	2	EN011IU	Writing AE2	2
PT001IU	Physical Training 1	0	EN012IU	Speaking AE2	2
EEAC001IU	Materials Science & Engineering	3	EE049IU	Introduction to EE	3
EE050IU	Intro to Computer for Engineers	3	PE021IU	General Laws	3
			PT002IU	Physical Training 2	0
Total Credits		16	*Total Credits*		18
Summer Session					
Total Credits		0			
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
PE015IU	Philosophy of Marxism and Leninism	3	MA026IU	Probability& Random Process	3
EEAC021IU	Mathematics for Engineers	4	MA024IU	Differential Equations	4
EE051IU	Principles of EE 1	3	PH012IU	Physics 4 (Optics & Atomics)	2
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE057IU	Programming for Engineers	3	EE056IU	Principles of EE 2 Lab	1
EE058IU	Programming for Engineers Lab	1	PE017IU	Scientific socialism	2
PE016IU	Political economics of Marxism and Leninism	2	EE053IU	Digital Logic Design	3
			EE054IU	Digital Logic Design Lab	1
Total Credits		17	*Total Credits*		19
Summer Session					
Military Training					
Junior Year (3rd year)					
Semester 1			*Semester 2*		

EE088IU	Signals & Systems	3	EE092IU	Digital Signal Processing	3
EE089IU	Signals & Systems Lab	1	EE093IU	Digital Signal Processing Lab	1
EE083IU	Micro-processing Systems	3	EEAC006IU	Programmable Logic Control	3
EE084IU	Micro-processing Systems Lab	1	EEAC007IU	Programmable Logic Control Lab	1
EE010IU	Electromagnetic Theory	3	EE130IU	Capstone Design 1	2
EE090IU	Electronics Devices	3	EEAC020IU	Theory of Automatic Control	4
EE091IU	Electronics Devices Lab	1	PE---IU	Engineering Ethics and Critical Thinking	3
PE018IU	History of Vietnamese Communist Party	2			
Total Credits		17	*Total Credits*		17
Summer Session					
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE131IU	Capstone Design 2	2	EE107IU	Senior Project	2
EEAC--IU	AC Elective Course 01	4	EE114IU	Entrepreneurship	3
EEAC004IU	PC Based Control and SCADA System	3	EEAC--IU	AC Elective Course 02	3
EEAC005IU	PC Based Control and SCADA System Lab	1	EEAC--IU	AC Elective Course 03	3
	General Elective	3	EEAC--IU	AC Elective Course 04	3
EEAC008IU	Sensors and Instrumentation	3	EEAC--IU	AC Elective Course 05	3
PE019IU	Ho Chi Minh's Thoughts	2			
Total Credits		18	*Total Credits*		17
Summer Session					
EE112IU	Summer Internship	3			
Senior Year (5th year)					
EE097IU	Thesis	10			
Total Credits		10	*Total Credits*		17

Total: 152 credits

b. CEA Program for IE2 Level

The CEA Program for IE2 level is shown as follows.

Freshman Year (1st year)					
Semester 1			*Semester 2*		
			MA001IU	Calculus 1	4

	IE2		EN007IU	Writing AE1	2
			EN008IU	Listening AE1	2
PT001IU	Physical Training 1	0	PH013IU	Physics 1 (Mechanics)	2
			EE049IU	Introduction to EE	3
			MA027IU	Applied Linear Algebra	2
			PE021IU	General Laws	3
			PT002IU	Physical Training 2	0
Total Credits		0	*Total Credits*		18
Summer Session					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE2	2
MA003IU	Calculus 2	4	EN012IU	Speaking AE2	2
Total Credits					10
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
EEAC001IU	Materials Science & Engineering	3	MA026IU	Probability& Random Process	3
EEAC021IU	Mathematics for Engineers	4	MA024IU	Differential Equations	4
EE050IU	Intro to Computer for Engineers	3	EE055IU	Principles of EE 2	3
EE051IU	Principles of EE 1	3	EE056IU	Principles of EE 2 Lab	1
EE052IU	Principles of EE 1 Lab	1	EE053IU	Digital Logic Design	3
EE057IU	Programming for Engineers	3	EE054IU	Digital Logic Design Lab	1
EE058IU	Programming for Engineers Lab	1	PE015IU	Philosophy of Marxism and Leninism	3
Total Credits		18	*Total Credits*		18
Summer Session					
Military Training					
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE088IU	Signals & Systems	3	PE017IU	Scientific socialism	2
EE089IU	Signals & Systems Lab	1	EE010IU	Electromagnetic Theory	3
EE083IU	Micro-processing Systems	3	EEAC006IU	Programmable Logic Control	3
EE084IU	Micro-processing Systems Lab	1	EEAC007IU	Programmable Logic Control Lab	1
EE090IU	Electronics Devices	3	EE130IU	Capstone Design 1	2
EE091IU	Electronics Devices Lab	1	EEAC020IU	Theory of Automatic Control	4
PE---IU	Engineering Ethics and Critical Thinking	3	PH012IU	Physics 4 (Optics & Atomics)	2

PE016IU	Political economics of Marxism and Leninism	2			
Total Credits		17	*Total Credits*		17
Summer Session					
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE131IU	Capstone Design 2	2	EE107IU	Senior Project	2
EE092IU	Digital Signal Processing	3	EEAC--IU	AC Elective Course 01	3
EE093IU	Digital Signal Processing Lab	1	EEAC--IU	AC Elective Course 02	3
EEAC004IU	PC Based Control and SCADA System	3	EEAC--IU	AC Elective Course 03	3
EEAC005IU	PC Based Control and SCADA System Lab	1	EEAC--IU	AC Elective Course 04	3
EEAC008IU	Sensors and Instrumentation	3	EE114IU	Entrepreneurship	3
PE018IU	History of Vietnamese Communist Party	2	PE019IU	Ho Chi Minh's Thoughts	2
	General Elective	3			
Total Credits		18	*Total Credits*		19
Summer Session					
EE112IU	Summer Internship	3			
Senior Year (5th year)					
EE097IU	Thesis	10			
EEAC--IU	AC Elective Course 05	4			
Total Credits		14	*Total Credits*		0

Total: 152 credits

c. CEA Program for IE1 Level

The CEA Program for IE1 level is shown as follows.

Freshman Year (1st year)					
Semester 1			*Semester 2*		
	IE1		MA001IU	Calculus 1	4
	IE2		EN007IU	Writing AE1	2
			EN008IU	Listening AE1	2
			PH013IU	Physics 1 (Mechanics)	2
			EE049IU	Introduction to EE	3
			MA027IU	Applied Linear Algebra	2
			PE021IU	General Laws	3
			PT001IU	Physical Training 1	0
Total Credits		0	*Total Credits*		18
Summer Session					

PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE2	2
MA003IU	Calculus 2	4	EN012IU	Speaking AE2	2
Total Credits					10
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
EEAC001IU	Materials Science & Engineering	3	MA026IU	Probability& Random Process	3
EEAC021IU	Mathematics for Engineers	4	MA024IU	Differential Equations	4
EE050IU	Intro to Computer for Engineers	3	EE055IU	Principles of EE 2	3
EE051IU	Principles of EE 1	3	EE056IU	Principles of EE 2 Lab	1
EE052IU	Principles of EE 1 Lab	1	EE053IU	Digital Logic Design	3
EE057IU	Programming for Engineers	3	EE054IU	Digital Logic Design Lab	1
EE058IU	Programming for Engineers Lab	1	PE015IU	Philosophy of Marxism and Leninism	3
PT002IU	Physical Training 2	0			
Total Credits		18	*Total Credits*		18
Summer Session					
Military Training					
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE088IU	Signals & Systems	3	PE017IU	Scientific socialism	2
EE089IU	Signals & Systems Lab	1	EE010IU	Electromagnetic Theory	3
EE083IU	Micro-processing Systems	3	EEAC006IU	Programmable Logic Control	3
EE084IU	Micro-processing Systems Lab	1	EEAC007IU	Programmable Logic Control Lab	1
EE090IU	Electronics Devices	3	EE130IU	Capstone Design 1	2
EE091IU	Electronics Devices Lab	1	EEAC020IU	Theory of Automatic Control	4
PE---IU	Engineering Ethics and Critical Thinking	3	PH012IU	Physics 4 (Optics & Atomics)	2
PE016IU	Political economics of Marxism and Leninism	2			
Total Credits		17	*Total Credits*		17
Summer Session					
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE131IU	Capstone Design 2	2	EE107IU	Senior Project	2

EE092IU	Digital Signal Processing	3	EEAC--IU	AC Elective Course 01	3
EE093IU	Digital Signal Processing Lab	1	EEAC--IU	AC Elective Course 02	3
EEAC004IU	PC Based Control and SCADA System	3	EEAC--IU	AC Elective Course 03	3
EEAC005IU	PC Based Control and SCADA System Lab	1	EEAC--IU	AC Elective Course 04	3
EEAC008IU	Sensors and Instrumentation	3	EE114IU	Entrepreneurship	3
PE018IU	History of Vietnamese Communist Party	2	PE019IU	Ho Chi Minh's Thoughts	2
	General Elective	3			
Total Credits		18	*Total Credits*		19
Summer Session					
EE112IU	Summer Internship	3			
Senior Year (5th year)					
EE097IU	Thesis	10			
EEAC--IU	AC Elective Course 05	4			
Total Credits		14	*Total Credits*		0

Total: 152 credits

d. CEA Program for IE0 Level

The CEA Program for IE0 level is shown as follows.

Freshman Year (1st year)					
Semester 1			*Semester 2*		
	IE0			IE2	
	IE1		PT001IU	Physical Training 1	0
Total Credits		0	*Total Credits*		0
Summer Session					
MA001IU	Calculus 1	4	EN007IU	Writing AE1	2
PH013IU	Physics 1 (Mechanics)	2	EN008IU	Listening AE1	2
Total Credits					10
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
MA003IU	Calculus 2	4	PT002IU	Physical Training 2	0
MA027IU	Applied Linear Algebra	2	EE049IU	Introduction to EE	3
EEAC001IU	Materials Science & Engineering	3	EE053IU	Digital Logic Design	3
EN011IU	Writing AE2	2	EE054IU	Digital Logic Design Lab	1
EN012IU	Speaking AE2	2	EE057IU	Programming for Engineers	3

EE050IU	Intro to Computer for Engineers	3	EE058IU	Programming for Engineers Lab	1
EE051IU	Principles of EE 1	3	PH014IU	Physics 2 (Thermodynamics)	2
EE052IU	Principles of EE 1 Lab	1	EEAC021IU	Mathematics for Engineers	4
			MA024IU	Differential Equations	4
Total Credits		20	*Total Credits*		21
Summer Session					
Military Training					
Total Credits					0
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE083IU	Micro-processing Systems	3	EE088IU	Signals & Systems	3
EE084IU	Micro-processing Systems Lab	1	EE089IU	Signals & Systems Lab	1
EE055IU	Principles of EE 2	3	EE010IU	Electromagnetic Theory	3
EE056IU	Principles of EE 2 Lab	1	EE131IU	Capstone Design 1	2
MA026IU	Probability& Random Process	3	EEAC020IU	Theory of Automatic Control	4
PH012IU	Physics 4 (Optics & Atomics)	2	EE090IU	Electronics Devices	3
PE015IU	Philosophy of Marxism and Leninism	3	EE091IU	Electronics Devices Lab	1
PE021IU	General Laws	3		General Elective	3
Total Credits		19	*Total Credits*		20
Summer Session					
PE018IU	History of Vietnamese Communist Party	2	PE016IU	Political economics of Marxism and Leninism	2
Total Credits					4
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE092IU	Digital Signal Processing	3	EE107IU	Senior Project	2
EE093IU	Digital Signal Processing Lab	1	EEAC--IU	AC Elective Course 01	3
EEAC004IU	PC Based Control and SCADA System	3	EEAC--IU	AC Elective Course 02	3
EEAC005IU	PC Based Control and SCADA System Lab	1	PE---IU	Engineering Ethics and Critical Thinking	3
EEAC008IU	Sensors and Instrumentation	3	EE114IU	Entrepreneurship	3

EE131IU	Capstone Design 2	2	PE019IU	Ho Chi Minh's Thoughts	2
EEAC006IU	Programmable Logic Control	3	EEAC--IU	AC Elective Course 03	3
EEAC007IU	Programmable Logic Control Lab	1			
PE017IU	Scientific socialism	2			
Total Credits		19	*Total Credits*		19
Summer Session					
EE112IU	Summer Internship	3			
Senior Year (5th year)					
EE097IU	Thesis	10			
EEAC--IU	AC Elective Course 04	3			
EEAC--IU	AC Elective Course 05	4			
Total Credits		17			

Total: 152 credits

(*) List of General Elective Courses

These electives give students the opportunity to explore any intellectual area. This freedom plays a critical role in helping students to define minor concentrations in areas such as bioengineering, technology and management, languages, or other engineering schools. You have to take 01 course from following list

Sub ID	Subjects	Credit(s)
BA003IU	Principles of Marketing	3
BA006IU	Business Communication	3
BA027IU	E-Commerce	3
BA098IU	Leadership	3
BA117IU	Introduction to Micro Economics	3
BA120IU	Business Computing Skills	3
ENEE1001IU	Engineering Drawing	3 (2 + 1 lab)
PE014IU	Environmental Science	3
ENEE2008IU	Environmental Ecology	3
CE103IU+04	Computer-Aided Design and Drafting (CADD)+Practice CADD	3+1
CE211IU	Hydrogoly-Hydraulics	3
IT069IU	Object-Oriented Programming	3
BM030IU	Machine Design	3
IS085IU	CAD/CAM/CNC	3 (2 + 1 lab)
IS019IU	Production Management	3
IS034IU	Product Design & Development	3
IS040IU	Management Information System	3
IS065IU	Supply Security and Risk Management	3
PH027IU	Earth observation and the environment	3
PH018IU	Introduction to Space Engineering	3
PH035IU	Introduction to Space Communications	3

PH037IU	Space Environment	3
PH040IU	Satellite Technology	3
EL017IU	Language and Culture	3
EL018IL	Cross-Cultural Communication	3
EL021IL	Global Englishes	3
EE072IU	Computer and Communication Network	3
ENEE2001IU	Introduction to Environmental Engineering	3

(**) List of Elective Courses for CEA Program

These courses are chosen by the school's Board. The elective requirement gives each student freedom to define a technical course of study in electrical engineering. Choices should be made with care, planning, and consultation with student's advisor. You have to take at least 5 courses (or equivalent to 16 credits in total) from the following list.

EE061IU EE062IU	Analog Electronics Analog Electronics Laboratory	3 1
EEAC011IU EEAC012IU	Automation Manufacturing System and Technique Automation Manufacturing System and Technique Lab	3 1
EEAC013IU	Power System and Equipment	3
EEAC014IU	Neuron Network and Fuzzy Logics	3
EEAC015IU	Robotics	3
EEAC016IU	Industrial Electronics	3
EEAC017IU	Digital Control	3
EEAC009IU	Electric Safety	3
EEAC010IU	Electric Machine	3
EE104IU EE118IU	Embedded Real-time Systems Embedded Real-time Systems Laboratory	3 1
EE102IU	Stochastic Signal Processing	3
EE103IU EE122IU	Image Processing and Computer Vision Image Processing and Computer Vision Laboratory	3 1
EEAC018IU	Advanced Control Engineering	3
EEAC019IU	System Diagnostic	3
EE068IU EE115IU	Principles of Communication Principles of Communication Laboratory	3 1
EE079IU EEAC003IU	Power Electronics Power Electronics Laboratory	3 1
EE127IU	Machine Learning and Artificial Intelligence	3
EE133IU	Emerging Engineering Technologies	3

II. COURSE DESCRIPTION

1. ELECTRONICS & TELECOMMUNICATIONS ENGINEERING

MA001IU **4 credits**

Calculus 1

Functions; Limits; Continuity; Derivatives, Differentiation, Derivatives of basic elementary functions, differentiation rules; Application of Differentiation: L'Hopital's rule, Optimization, Newton's method; Anti-derivatives; Indefinite integrals, definite integrals; Fundamental theorem of calculus; Technique of integration; Improper integrals; Applications of integration.

MA003IU **4 credits**

Calculus 2

Sequence and series; Convergence tests; Power series; Taylor &Maclaurin series; Cartesian Coordinates; Lines, Planes and Surfaces; Derivatives and integrals of vector functions; Arc length and curvature; parametric surfaces; 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.

Prerequisite: MA001IU (Calculus 1)

MA023IU **4 credits**

Calculus 3

Complex numbers, complex series, complex functions, complex derivatives; Laplace transform; z- transform; Fourier series, Fourier transform, the inverse transform, transforms of derivatives and integrals; first-order differential equations, second-order differential equations, difference equations, applications to electrical circuits and signal processing.

Prerequisite: MA003IU (Calculus 2)

MA027IU **2 credits**

Applied Linear Algebra

Matrices; Linear independence, Rank of a matrix, linear systems of equations, Gauss elimination, Solutions of linear systems: Existence, uniqueness, determinants, Cramer's rule, inverse of a matrix, Gauss-Jordan elimination, vector spaces, inner product spaces, linear transformations, eigenvalues, eigenvectors, applications; Symmetric, Skew-symmetric, and orthogonal matrices, Eigenbases, diagonalization; Quadratic forms, complex matrices and forms.

MA024IU **4 credits**

Differential Equations Processes

First-order differential equations; second-order linear differential equations, undetermined coefficients, variation of parameters, applications, higher-order linear differential equations, systems of first-order linear equations, elementary partial differential equations and the method of separation of variables. This course also provides the laboratory by using Maple and Matlab to solve many different types of differential equations.

Prerequisite: MA003IU (Calculus 2)

MA026IU **3 credits**

Probability & Random Processes

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.

Prerequisite: MA003IU (Calculus 2)

PH013IU **2 credits**

Physic 1 (Engineering Mechanics)

An introduction to mechanics including: planar forces, free body diagrams, planar equilibrium of rigid bodies, friction, distributed forces, internal forces, shear force and bending moment diagrams, simple stress and strain and associated material properties, kinematics and kinetic of particles, work and energy, motion of rigid bodies in a plane.

PH014IU **2 credits**

Physic 2 (Thermodynamics)

This course provides students basic knowledge about fluid mechanics; macroscopic description of gases; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gases and the kinetic theory of gases.

PH015IU **3 credits**

Physics 3 (Electricity & Magnetism)

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.

Prerequisite: PH013IU (Physic 1)

Co-requisite:PH016IU (Physics 3 Laboratory)

PH016IU **1 credit**

Physics 3 Laboratory
This laboratory includes the topics on vector and uncertainties; electrostatic; Ohm's law; magnetic force; ampere law; faraday law and RLC circuits.

Co-requisite:PH015IU (Physics 3)

PH012IU **2 credits**
Physics 4 (Waves and Optics)
Waves and optics, relativity, quantum properties of electrons and photons, wave mechanics, atomic, solid state, nuclear and elementary particle physics.

Prerequisite: PH013IU (Physic 1)

CH011IU **3 credits**
Chemistry for Engineers
This course is designed for non-chemistry majors, as it is intended for students pursuing a degree in information technology, electronic and telecommunication. The course is designed to provide a strong background in the fundamentals of chemistry, preparing students for further study in their major field. Topics include important principles, theories, concepts of chemistry, and chemical calculations necessary for a comprehension of the structure of matter, the chemical actions of the common elements and compounds. The impact of chemistry on everyday life and on the environment is also introduced wherever possible.

Co-requisite:CH012IU (Chemistry for Engineers Laboratory)

EN007IU & EN008IU **4 credits**
Academic English 1
This course concentrates on academic English listening and writing skills.
Strategies for Academic Listening, Note-taking, and Discussion will help the student face the challenges of learning English in an Academic environment. The student will learn to do all the things that successful international college students do – listen actively to lectures, take effective notes, and participate confidently in discussions about the lecture with classmates and the lecturer. While learning these strategies, you will also learn and use common academic vocabulary as well as useful idioms.
Writing skills are developed for pre-advanced academic writers. It focuses on composition writing using Writing process, Building Framework, Description, Opinion, Process, Comparison-Contrast, Cause-Effect, Problem-Solution, and Argument. Students will have writing practice in "Real-World Writing" formats.

EN011IU & EN012IU **4 credits**
Academic English 2
This course concentrates on academic English speaking and writing skills.
Speaking subject provides students with the skills to be able prepare and deliver effective formal, structured presentations that are appropriate to the specific environment and audience.
Writing subject 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 thesis statements; outlining; locating and documenting sources; taking notes; writing introductions, body paragraphs, and conclusions; and writing rough and final drafts. Students work with projects relating to their content area courses.

Prerequisite: EN007IU & EN008IU (Academic English 1)

PE008IU **3 credits**

Critical Thinking

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. The course covers introduction to critical thinking; meaning analysis and argument analysis; basic logic, sentential logic (SL) and predicate logic; Venn diagrams; scientific reasoning; basic statistics; strategic thinking; values and morality; fallacies & biases; and introduction to creativity thinking.

PE015IU **3 credits**

Philosophy of Marxism and Leninism

This course provides students the fundamental knowledge of Marxism and Leninism.

PE016IU **2 credits**

Political Economics of Marxism and Leninism

The program content consists of 6 chapters: In which, Chapter 1 discusses the objects, research methods and functions of Marxist-Leninist Political Economy. Chapters 2 to 6 present the core content of Marxist-Leninist Political Economy according to the subject's objectives such as: Commodities, markets and the role of actors in the market economy; Producing surplus value in a market economy; Competition and monopoly in the market economy; Socialist-oriented market economy and economic interest relations in Vietnam; Industrialization, modernization and international economic integration in Vietnam.

Co-requisite:PE015IU (Philosophy of Marxism and Leninism)

PE017IU **2 credits**

Scientific Socialism

This course provides students the fundamental knowledge of scientific socialism

Prerequisite: PE015IU (Philosophy of Marxism and Leninism)
PE016IU (Political Economics of Marxism and Leninism)

PE018IU **2 credits**

History of Vietnamese Communist Party

This course provides students the fundamental knowledge of Vietnamese Communist Party

Prerequisite: PE015IU (Philosophy of Marxism and Leninism)
PE016IU (Political Economics of Marxism and Leninism)
PE017IU (Scientific Socialism)

PE019IU **2 credits**

Ho Chi Minh's Thoughts

The course equips students with basic knowledge about: objects, research methods and learning meanings of Ho Chi Minh's thoughts; the process of formation and development of Ho Chi Minh thought; on national independence and international solidarity; about culture, ethics, people.

Prerequisite: PE015IU (Philosophy of Marxism and Leninism)
PE016IU (Political Economics of Marxism and Leninism)
PE017IU (Scientific Socialism)

PE—IU **3 credits**

Engineering Ethics and Critical Thinking

This course is designed to introduce engineering students to the theory and practice of engineering ethics using a multidisciplinary and cross-cultural approach. Theory includes classical ethics and in-depth engineering. Historical research is drawn primarily from the academic literature on engineering ethics. The course will help students explore the relationship between ethics and engineering and apply classical ethical theories to decision-making to engineering problems encountered in later study and work.

Critical thinking studies a process integral to all educated people - the process by which we develop and support our beliefs and evaluate the strength of arguments made by others in real situation. It includes practice in inductive and deductive reasoning, presenting arguments in oral and written form, and analyzing the use of language to influence thought. The course also applies the reasoning process to other areas such as business, science, law, social sciences, ethics and the arts.

PE021IU **3 credits**

General Laws

This course will introduce students to the Vietnamese legal system. In particular, students will understand their rights and obligations in the constitution, criminal law, administrative law, civil law, labor law and corporate law of Vietnam. From there, students will raise their awareness of their responsibility for ensuring justice, including ending corruption in society.

EE049IU **3 credits**

Introduction to Electrical Engineering

This course is an introduction to engineering processes for future electrical engineering. This course provides the students with the fundamental concepts of the electrical engineering profession. In addition, the students will learn the proper usage of engineering tools, including computers and measurement equipment. Students will also perform statistical analysis of experimental data, define engineering requirements, and implement simulation.

EE050IU **3 credits**

Introduction to Computer for Engineers

This course is an introduction to solving engineering problems through the use of the computer. It introduces general problem-solving techniques including the concepts of

step-wise refinement applied to the development of algorithms. This course will cover elementary programming concepts using the programming language Matlab and apply those concepts towards the solution of engineering problems.

EE051IU **3 credits**

Principles of Electrical Engineering 1

This course is an introduction to basic circuit elements; independent sources; dependent sources; circuit analysis in DC and AC steady state; network theorems; operational amplifiers; and power computations.

Prerequisite: MA001IU (Calculus 1)
Co-requisite: EE052IU (Principles of EE 1 Laboratory)

EE052IU **1 credit**

Principles of Electrical Engineering 1 Laboratory

This course provides experimental exercises in use of laboratory instruments; voltage, current, impedance, frequency, and waveform measurements; rudiments of circuit modeling and design.

Co-requisite: EE051IU (Principles of EE 1)

EE055IU **3 credits**

Principles of Electrical Engineering 2

This course includes the following topics: transient analysis by classical methods and by Laplace transform analysis, step and impulse response, three-phase circuit and two-port networks. Passive and active filter circuit design, Butterworth filter design. Introduction to Fourier series.

Prerequisite: EE051IU (Principles of EE 1)
MA023IU (Calculus 3) for EE
EEAC002IU (Mathematics for Engineers) for AC
Co-requisite:EE056IU (Principles of EE 2 Laboratory)

EE056IU **1 credit**

Principles of Electrical Engineering 2 Laboratory

This laboratory includes topics on transient analysis; frequency response; filters design; two port network and Fourier series.

Co-requisite: EE055IU (Principles of EE 2)

EE053IU **3 credits**

Digital Logic Design

This course introduces the basic tools for design with combinational and sequential digital logic and state machines. To learn simple digital circuits in preparation for computer engineering. Main content: Binary arithmetic, Boolean algebra, K-maps, Combinational circuit synthesis, Combinational MSI circuits, Sequential logic, Synchronous state machine design, Sequential MSI circuits.

Co-requisite: EE054IU (Digital Logic Design Laboratory)

EE054IU **1 credit**

Digital Logic Design Laboratory

This laboratory includes topics on combinational SSI and MSI circuits; four-bit arithmetic circuit; sequential circuits; state machine analysis and state machine synthesis.

Co-requisite: EE053IU (Digital Logic Design)

EE057IU **3 credits**

Programming for Engineers

This course provides the basics of programming and data structures in C++ include: 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.

Prerequisite: MA001IU (Calculus 1)

Co-requisite: EE058IU (Programming for Engineers Laboratory)

EE058IU **1 credit**

Programming for Engineers Laboratory

This is a co-requisite course with EE057IU (programming for engineers).

Co-requisite: EE057IU (Programming for Engineers)

EE067IU **3 credits**

Electromagnetic Theory

Electrical conduction theories, conducting materials and insulators, magnetic and dielectric properties and materials, electrostatics and magneto-statics, steady electric currents, the magnetic field of steady electric currents, Ampere's law and its applications, electromagnetic induction, Faraday's law and its applications, electromagnetism, simple transmission lines, magnetic circuits, permanent magnets, inductors, transformers, introduction to electrical machines.

Prerequisite: Calculus 3 (MA023IU)

EE090IU **3 credits**

Electronic Devices

Fundamentals of semiconductor devices and microelectronic circuits, characteristics of p-n, Zener diodes, and analog diode circuits. Principles of MOSFET and BJT operation, biasing, transistor analysis at mid-band frequencies.

Prerequisite: EE051IU (Principles of EE 1)

Co-requisite: EE091IU (Electronic Devices Laboratory)

EE091IU **1 credit**

Electronic Devices Laboratory

Laboratory experiments in microelectronic circuits using semiconductor devices, including diodes, MOSFETs and BJTs. Employing a learn-by-doing approach, emphasizing the hands-on-experimental experiences and computer simulation.

Co-requisite: EE090IU (Electronic Devices)

EE094IU **3 credits**

Digital Electronics

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.

Prerequisite: EE090IU (Electronic Devices)

Co-requisite: EE095IU (Digital Electronics Laboratory)

EE095IU **1 credit**

Digital Electronics Lab

Laboratory experiments in transistor-level realization of CMOS, BiCMOS, TTL and ECL logic gates.

Employing a learn-by doing approach, emphasizing the hands-on-experimental experiences and computer simulation.

Co-requisite: EE094IU (Digital Electronics)

EE083IU **3 credits**

Micro-processor Systems

This course provides students the fundamentals of microprocessors and microcomputers; data flow; machine programming; assembly languages, architectures and instructions sets; stacks, subroutines, I/O, and interrupts; interfacing fundamentals; designing with microprocessors, and applications of micro-processing systems to some practical problems.

Prerequisite: EE053IU (Digital Logic Design)

EE057IU (Programming for Engineers)

Co-requisite: EE084IU (Micro-processor System Laboratory)

EE084IU **1 credit**

Micro-processor Systems Lab

This is a co-requisite course of EE083IU. The laboratory includes location and description the components on the 32-Bit Microprocessor circuit board; demonstration of basic data transfer operations, memory transfers and describe memory control signals, the signals needed to transfer data between the CPU and its components, how the CPU processes hardware and software interrupts, addressing modes of the 80386 CPU; Use machine codes to write instruction for use in memory test programs and real-world applications.

Prerequisite: EE053IU (Digital Logic Design)

EE057IU (Programming for Engineers)

Co-requisite: EE083IU (Micro-processor System)

EE088IU **3 credits**

Signals & Systems

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.

Prerequisite: EE055IU (Principles of EE 2)

Co-requisite: EE089IU (Signal & Systems Laboratory)

EE089IU **1 credit**

Signals & Systems Lab

Experimental exercises via simulation using MATLAB to get understanding of frequency and time domain analysis of linear dynamic systems and corresponding signals. Finding the response of continuous- and discrete-time linear systems via simulation.

Co-requisite: EE088IU (Signal & Systems)

EE092IU **3 credits**

Digital Signal Processing

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.

Prerequisite: EE088IU (Signal & Systems)

Co-requisite: EE093IU (Digital Signal Processing Laboratory)

EE093IU **1 credit**

Digital Signal Processing Lab

To carry out software and hardware experiments illustrating the basic principles and techniques of digital signal processing and to illustrate some concrete applications, such as filtering for noise reduction and digital audio effects.

Prerequisite: EE088IU (Signal & Systems)

Co-requisite: EE092IU (Digital Signal Processing)

EE068IU **3 credits**

Principles of Communication Systems

To understand basic analog and digital communication system theory and design, with an emphasis on wireless communications methods. Main content: Analog Communication, Random processes and Noise, Quantization, Digital Communication.

Prerequisite: EE088IU (Signals and Systems)

MA026IU (Probabilities and Random Processes)

Co-requisite: EE115IU (Principles of Communication Systems Laboratory)

EE115IU **1 credit**

Principles of Communication Systems Laboratory

This course provides experiments dealing with basic fundamental concepts of communication systems. It includes the following topics: Amplitude Modulation/Demodulation; Angle Modulation/Demodulation; Sampling, Holding and Reconstruction of PAM signals; Pulse Code Modulation; Amplitude Shift Keying, Phase Shift Keying.

Co-requisite: EE068IU (Principles of Communication Systems)

EE114IU **3 credits**

Entrepreneurship

In this course the student will learn the essential skills needed to start and manage a successful new business venture. Topics will cover: the challenge of entrepreneurship, building a business plan, marketing and financial issues with a start-up company, and how to gain the competitive advantage.

EE130IU **2 credits**

Capstone Design 1

This course is an introduction to engineering design process. This course consists of two semesters of lecture and design. This course requires students to develop a project based on the knowledge and skills acquired in earlier coursework and integrate their technical knowledge through practical design effort. Students will learn to define a problem, conduct research to propose the solutions, determine the realistic constraints, prepare project scheduling, and create a planned budget for the project. The work will be performed as a team in accordance with ABET requirements. Each team is comprised of two to four students

EE132IU **2 credits**

Capstone Design 2

Students will be assigned a faculty member to oversee the progress of the project. The student will follow the design process, under the guidance of the assigned faculty member, and to develop the prototype based on the design specifications from Capstone Design Project 1. The work will be performed as a team in accordance with ABET requirements. Each team is comprised of two to four students

Prerequisite: EE131IU (Capstone Design 1)

EE107IU **2 credits**

Senior Project

In the field of Electrical Engineering, the senior focuses on design projects related to the EE field. In addition to the accumulation of theoretical knowledge, the thesis requires solving difficulties encountered in practice as well as addressing safety issues and ethics.

EE097IU **10 credits**

Thesis

These 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).

Prerequisite: EE107IU (Senior Project)

EE061IU **3 credits**

Analog Electronics

Feedback amplifier analysis, frequency response of BJT and FET amplifiers, and frequency response with feedback stability, power amplifiers, filters and tuned amplifiers, signal generator and waveform-shaping circuits.

Prerequisite: EE090IU (Electronic Devices)
Co-requisite: EE062IU (Analog Electronics Laboratory)

EE062IU **1 credit**

Analog Electronics Laboratory

This laboratory includes topics on differential transistor amplifiers; cascode amplifiers; the constant current source; current mirrors; high frequency transistor amplifiers; feedback amplifiers; stability of feedback amplifiers and feedback compensation.

Co-requisite: EE061IU (Analog Electronics)

EE105IU **3 credits**

Antenna and Microwave Engineering

The course provides students the understanding of radiation fundamentals, linear antennas, point source arrays, aperture antennas, antenna impedance, antenna systems. Basic concepts of microware engineering such as transmission lines, Smith plot, microwave circuits, analysis techniques, design and applications.

Pre-requisite: EE067IU (Electromagnetic Theory)
Co-requisite: EE124IU (Antenna & Microwave Engineering Laboratory)

EE124IU **1 credit**

Antenna and Microwave Engineering Laboratory

Antenna & Microwave Engineering Practical Workbook covers a variety of experiments that are designed to aid students in their profession and theory. They include a variety of topics which include antennas, transmission lines and microwave waveguides. A practical exposure to such equipment is necessary as it builds on the theory taught to students.

Pre-requisite: EE067IU (Electromagnetic Theory)
Co-requisite: EE105IU (Antenna & Microwave Engineering)

EEAC020IU **4 credits**

Theory of Automatic Control

This course is intended to introduce students to concepts and techniques of classical control and to briefly introduce some concepts of modern control and discrete-time. The main goal is to enable students to analyze, design, and synthesize linear control systems. Students will become familiar with analytical methods and will be exposed extensively to the use of computers for analysis and design of control systems.

*Pre-requisite***:** *EE055IU (Principles of EE2)*

EE063IU **3 credits**

Digital System Design

This course introduces methodology and techniques to design digital systems. The topics including the basic concepts, analysis, and system design with hardware description languages (HDL). The course provides an insight of the design of asynchronous sequential circuits and complex synchronous systems. Design process is introduced by concepts, documents, and simulation.

Pre-requisite: EE053IU (Digital Logic Design)
Co-requisite: EE117IU (Digital System Design Laboratory)

EE117IU **3 credits**

Digital System Design Lab

This lab helps students understand better about techniques to design digital systems. This lab includes software and hardware topics: Introduction to Maxplus II software, Counter, Introduction to VHDL in Maxplus II, Digital Clock.

Pre-requisite: EE053IU (Digital Logic Design)
Co-requisite: EE063IU (Digital System Design)

EE066IU **3 credits**

VLSI Design

This course provides an introduction to digital VLSI chip design based on CMOS technology and including dynamic clocked logic, analog MOSFET timing analysis, and layout design rules. The course develops the use of computer-aided design

software tools and cell library construction as well as an understanding of elementary circuit testing.

Prerequisite: EE053 (Digital Logic Design)
EE094 (Digital Electronics)
Co-requisite: EE121IU (VLSI Design Lab)

EE121IU **1 credit**
VLSI Design Lab
This laboratory provides an introduction to digital VLSI chip design based on the use of VLSI design tools to design a MIPS microprocessor chip. The laboratory employs a learning-by-doing approach, emphasizing hands-on practical design experiences and computer simulations.

Prerequisite: EE053 (Digital Logic Design)
EE094 (Digital Electronics)
Co-requisite: EE066IU (VLSI Design)

EE079IU **3 credits**
Power Electronics
This course introduces the application of electronics to energy conversion and control. Topics cover modeling, analysis, and control techniques; design of power circuits including inverters, rectifiers, and DC-DC converters; analysis and design of magnetic components and filters; and characteristics of power semiconductor devices. Numerous application examples will be presented such as motion control systems, and power supplies.

Prerequisite: Electronic Devices (EE090IU)
Co-requisite: Power Electronics Laboratory

EEAC003IU **1 credit**
Power Electronics Lab
This course assists the theoretical course (Power electronics) involving the energy conversion and control. It covers the building and measuring rectifiers, inverters, and DC/DC converters; Analyzing and measuring filters; investigating into current-voltage characteristics of power semiconductor devices.

Prerequisite: Electronic Devices (EE090IU)
Co-requisite: Power Electronics

EE104IU **3 credits**
Embedded Real-time Systems
This course addresses the considerations in designing real-time embedded systems, both from a hardware and software perspective. The primary emphasis is on real-time processing for communications and signal processing systems. Programming projects in a high-level language like C/C++ will be an essential component of the course, as well as hardware design with modern design tools.

Prerequisite: EE083IU (Microprocessor Systems)
Co-requisite: EE118IU (Embedded Real-time System Laboratory

EE118IU **1 credit**

Embedded Real-time Systems Lab

This course integrates microprocessors into digital systems. The course includes hardware interfacing, bus protocols and peripheral systems, embedded and real-time operating systems, real-time constraints, networking, and memory system.

Prerequisite: EE083IU (Microprocessor Systems)

Co-requisite: EE104IU (Embedded Real-time System)

EE070IU **3 credits**

Wireless Communication Systems

This course introduces: Radio Propagation, Cochannel Interference, Spectral Efficiency and Power Efficiency, Diversity Schemes, Multiple Access Interference, Radio Resource Management, Performance of TDMA, CDMA and WiFi Systems.

Prerequisite: EE068IU (Principles of Communication Systems)

Co-requisite: EE116IU (Wireless Communication Systems Laboratory)

EE116IU **1 credit**

Wireless Communication Systems Laboratory

Radio Propagation, Co-channel Interference, Spectral Efficiency and Power Efficiency, Diversity Schemes, Multiple Access Interference, Radio Resource Management, Performances of TDMA, CDMA and Wi-Fi Systems.

Prerequisite: EE068IU (Principles of Communication Systems)

Co-requisite: EE116IU (Wireless Communication Systems Laboratory)

EE072IU **3 credits**

Computer and Communication Networks

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

Prerequisite: MA026IU (Probability and Random Processes)

EE119IU **3 credits**

Telecommunication Networks

This course provides the principles underlying telecommunication networks. Using a top-down approach and emphasizing data and computer communication within the framework of the OSI layers, the course will cover topics in the application, transport, network and link layers of the protocol stack. Topics includes TCP/IP protocol architectures, circuit-switching and packet-switching, network management, data link protocols including HDLC, routing flow control, file transfer protocols, cryptography, and text compression. It also introduces important merging technologies, such as, integrated voice and data networks (VOIP) and the integration of wireless and wired networks.

Prerequisite: EE088IU (Signals & Systems)

EE068IU (Principle of communication systems)

Co-requisite: EE120IU (Telecommunication Networks Lab)

EE120IU **1 credit**

Telecommunication Networks Laboratory
Experimental exercises via simulation and hardware to get understanding of data communications and networking.

Prerequisite: EE088IU (Signals & Systems)
EE068IU (Principle of communication systems)
Co-requisite: EE119IU (Telecommunication Networks)

EE103IU **3 credits**
Image Processing and Computer Vision
The course begins with one-to-one operations such as image addition and subtraction and image descriptors such as the histogram. Basic filters such as the gradient and Laplacian in the spatial domain are used to enhance images. The 2-D Fourier transform is introduced and frequency domain operations such as high and low-pass filtering are developed. It is shown how filtering techniques can be used to remove noise and other image degradation. The different methods of representing color images are described and fundamental concepts of color image transformations and color image processing are developed. The concepts of image redundancy and information theory are shown to lead to image compression. Lossless and lossy image processing algorithms such as LZW will be covered and related to image compression standards such as JPEG. Programming assignments will use MATLAB and the MATLAB Image Processing Toolbox.

Prerequisite: EE088IU (Signals and Systems)
MA026IU (Probability and Random Processes)
Co-requisite: EE122IU (Image Processing Lab)

EE122IU **1 credits**
Image Processing and Computer Vision Laboratory
Experimental exercises via simulation using MATLAB to get understanding of digital image processing and basic concepts of computer vision: image enhancement in time domain and frequency domain, morphology and segmentation

Prerequisite: EE088IU (Signals and Systems)
MA026IU (Probability and Random Processes)
Co-requisite: EE103IU (Image Processing)

EE102IU **3 credits**
Stochastic Signal Processing
Introduction to the theory and algorithms used for the analysis and processing of random signals (stochastic signals) and their applications to communications problems.

Prerequisite: EE092IU (Digital Signal Processing)

EE123IU **2 credits**
Special Topics in Electrical Engineering

This course provides students a broad understanding on the following topics: Optical Communication Systems, Satellite Communications, Wireless Sensor Networks, OFDM System, Microelectronics, Multimedia Signal Processing, Computer vision, and Biomedical Engineering.

EE074IU **3 credits**

Digital Signal Processing Design

Applications of DSP algorithms in the areas of speech processing, image processing, communications, and adaptive filtering using software implementations applied to realistic signals.

Prerequisite: EE092IU (Digital Signal Processing)

EE125IU **3 credits**

RF Circuit

The course focuses on the analysis and design of Radio Frequency circuits. It covers the design of passive and active RF circuits, including: impedance matching networks, RF filter design, power amplifier, mixers, RF Oscillator, low noise amplifier (LNA)

Prerequisite: EE090IU (Electronics Devices)

Co-requisite: EE126IU (RF Circuit Lab)

EE126IU **1 credit**

RF Circuit Lab

The course enables the student to get hands-on experience in RF circuit design through the use of computer-aided design tools to simulate and analyze RF-circuits, and perform measurements in the lab using network and spectrum analyzers.

Prerequisite: EE090IU (Electronics Devices)

Co-requisite: EE125IU (RF Circuit)

EE127IU **3 credit**

Machine Learning and Artificial Intelligence

The course is about the most effective machine learning techniques, and students gain practice implementing them and getting them to work for yourself. More importantly, you'll learn about not only the theoretical underpinnings of learning, but also gain the practical know-how needed to quickly and powerfully apply these techniques to new problems.

Prerequisite: EE090IU (Introduction to Computer for Engineers)

EE128IU **3 credit**

Internet of Things

Students will understand the concepts of Internet of Things and can able to build IoT applications. This course provides an overview on IoT tools and applications including sensing devices, actuation, processing and communications. The course also introduces hands-on IoT concepts including sensing, actuation, and communication through lab experiments with IoT development kits.

Prerequisite: EE083IU (Microprocessing Systems)

Co-requisite: EE129IU (Internet of Things Lab)

EE129IU **1 credit**

Internet of Things

In this course the students will study and do experiments IoT development KIT. Student will be able to practice with following topics: Design IoT applications in different domain and be able to analyze their performance, Implement basic IoT applications on embedded platform

Prerequisite: EE083IU (Microprocessing Systems)

Co-requisite: EE128IU (Internet of Things)

EE133IU **3 credit**

Emerging Engineering Technologies

This course will explore current breakthrough technologies and disruptive innovations that have recently emerged in the past few years. A close examination of the technology will be conducted to understand the application using the new technologies. The class is a series of seminars on each of the emerging technologies.

2. CONTROL ENGINEERING & AUTOMATION PROGRAM

EEAC021IU **4 credits**

Mathematics for engineers

This course develops a synthetic view of mathematic knowledge and skills in analyzing and modeling Signals and Systems. Covers review of fundamental harmonic analysis, with applications in Electronics, Control, Communications and Signal processing.

Prerequisite: Calculus 2 (MA003IU).

EEAC002IU **3 credits**

Materials Science and Engineering

Structure, properties, and processing of metallic, semiconductor, polymeric, ceramic, and composite materials. Perfect and imperfect solids; phase equilibria; transformation kinetics; mechanical behavior; material degradation. Approach involves both materials science and materials engineering components

EEAC020IU **4 credits**

Theory of Automatic Control

This course is intended to introduce students to concepts and techniques of classical control and to briefly introduce some concepts of modern control and discrete-time. The main goal is to enable students to analyze, design, and synthesize linear control systems. Students will become familiar with analytical methods and will be exposed extensively to the use of computers for analysis and design of control systems.

*Pre-requisite***:** *Differential Equations Processes (MA024IU*)

EE079IU **3 credits**

Power Electronics

This course introduces the application of electronics to energy conversion and control. Topics cover modeling, analysis, and control techniques; design of power circuits including inverters, rectifiers, and DC-DC converters; analysis and design of magnetic components and filters; and characteristics of power semiconductor devices. Numerous application examples will be presented such as motion control systems, and power supplies.

Prerequisite: Electronic Devices (EE090IU)

Co-requisite: Power Electronics Laboratory

EEAC003IU **1 credit**

Power Electronics Lab

This course assists the theoretical course (Power electronics) involving the energy conversion and control. It covers the building and measuring rectifiers, inverters, and DC/DC converters; Analyzing and measuring filters; investigating into current-voltage characteristics of power semiconductor devices.

Prerequisite: Electronic Devices (EE090IU)

Co-requisite: Power Electronics

EEAC004IU **3 credits**

PC Based Control and SCADA System

PC Based Control and SCADA system course provides students with knowledge of implementing control and measurement using PC, A/D, knowledge of DA converters, peripheral devices, the electronics that go along with sensors to refine and condition their outputs. The knowledge of Supervisory Control and Data Acquisition (SCADA) system as well as the SCADA commercial software will be included

Prerequisite: Microprocessor Systems (EE083IU)

Co-requisite: PC Based Control and SCADA System Laboratory.

EEAC005IU **1 credit**

PC Based Control and SCADA System Lab

This course is designed to provide the student with practical implementations of writing control programs using PC to supervise and acquire data though peripheral devices, exploring the sensors and various types of analog to digital converters

Prerequisite: Microprocessor Systems (EE083IU)

Co-requisite: PC Based Control and SCADA System Laboratory.

EEAC006IU **3 credits**

Programmable Logic Control (PLC)

Provide the student with fundamental concepts of PLC and PLC systems: the PLC architecture, PLC programming languages, the basic knowledge of the industrial communication network, methods of analysis, and design.

Prerequisite: Digital Logic Design (EE053IU)

Co-requisite: Programmable Logic Control Laboratory.

EEAC007IU **1 credit**

Programmable Logic Control Laboratory

This course is designed to provide the student with experimental knowledge of the S7-200 PLC from Siemens as well as S7-200 PLC systems through lab manuals: write control programs, choose hardware for a control system such as I/O modules, communication modules, A/d, D/A modules…

Prerequisite: Programmable Logic Control.

EEAC008IU **3 credits**

Sensors and Instrumentation

This course introduces students to the state-of-the-art practice in electronic instrumentation systems, including the design of sensor/transducer elements, their respective interface electronics, and precision measurement techniques. Students will be familiarized with techniques used in acquisition, processing, and presentation of sensor signals: transducers, Fourier analysis, flow measurement, amplifiers, and bridge circuits.

Prerequisite: Principle of EE 2 (EE055IU).

EEAC011IU **3 credits**

Automation Manufacturing System and Technique

This course is designed to highlight the major automation-related subjects within the scope of manufacturing system. Special emphasis will be given on industrial robotics, robot programming and flexible manufacturing systems (FMS). This course also transfers to student facts in real manufacturing production lines from the experiences of lecturers and visiting speakers.

Co-requisite: Automation Manufacturing System and Technique Lab

EEAC012IU **1 credit**

Automation Manufacturing System and Technique Lab

This course is designed to allow students to practice on the major automation-related subjects within the scope of manufacturing system. Special emphasis will be given on industrial robotics, robot programming and flexible manufacturing systems (FMS). This course also transfers to student facts in real manufacturing production lines from the experiences of lecturers and visiting speakers.

Co-requisite: Automation Manufacturing System and Technique

EEAC013IU **3 credits**

Power System and Equipment

Provide the student with fundamental knowledge of electric power systems and components of power system such as: electrical generators, electric motors, relays, contactors, circuit breakers and measurement devices.

EEAC014IU **3 credits**

Neural Networks and fuzzy controls

This course exposes the student to the fundamental issues related to the neural networks and some training techniques and fuzzy logics with applications to design intelligent control systems. The course also introduces some industrial applications.

Prerequisite: Theory of Automatic Control (EE075IU)

EEAC015IU **3 credits**

Robotics

This course introduces fundamental concepts in Robotics. Basic concepts will be discussed, including coordinate transformation, kinematics, dynamics, equations of motion, feedback and feed forward control, and trajectory planning. Applying the theoretical knowledge to various motor systems, including manipulators, and mobile robotics.

Prerequisite: Theory of Automatic Control (EE075IU)

EEAC016IU **3 credits**

Industrial Electronics

Fundamentals of electronics and semiconductor devices, including basic device principles. Application of electronic devices for electric power conversion, control and operation of industrial equipment.

Prerequisite: Third year student who have completed all engineering physics, chemistry and calculus courses

EEAC017IU **3 credits**

Digital Control

This course exposes the student to the fundamental issues related to the analysis and design of digital control systems. The student will learn how to analyze, model, and design control systems that ensure desirable properties, such as stability and performance.

Prerequisite: Theory of Automatic Control (EE075IU)

EEAC009IU **3 credits**

Electrical Safety

The course is oriented to the understanding of electrical hazards to prevent it. Firstly, it introduces the student to the knowledge of how to recognize, evaluate and control electrical hazards. Some guidance regarding how to proceed in case of an emergency is also covered. Then, it provides students the safety rules and regulations for electricians, precautions for electrical and mechanical hazards on the job, tool and equipment safety, first aid, Cardio-Pulmonary Resuscitation (CPR), blood borne pathogens, Occupational Safety and Health Administration (OSHA) and National Fire Protection Association (NFPA) mandated lockout/tag-out, personal protective equipment, right to know, and confined space entry procedures.

EEAC010IU **3 credits**

Electric Machine

This course exposes the student to the fundamental of electromagnetic circuits, principle of Electro mechanical – Energy – Conversion and its applications in electric motors. This course provides also the knowledge and structure of different electric motors.

Prerequisite: Principle of Electrical Engineering 2 (EE055IU)

EEAC018IU **3 credits**

Advanced Control Engineering

The aim of this course is to introduce the student the advanced topics on control engineering. Based on state space representation in both continuous and discrete-time, the problematic of observer-based control is discussed. Then principle of optimal control is followed. The topic on non-linear control is also covered.

Prerequisite: Theory of Automatic Control (EE075IU)

EEAC019IU **3 credits**

System Diagnostic

The aim of this course is to introduce the student the initiative of fault detection, isolation and localization in physical systems. The concepts of residue and parity space in both static and dynamic case are discussed. The method for detection and isolation the abnormal sensors using state observer and state estimation is also introduced.

Welcome to School of ELECTRICAL ENGINEERING

CONTACT US:

SEE Office (O2.206) - General inquiries:

1. Ms. Lý Thị Mỹ Dung, M. BA. (Secretary)
Email: ltmdung@hcmiu.edu.vn

2. Ms. Bùi Bích Trâm, B. Eng (Secretary)
Email: bbtram@hcmiu.edu.vn

Website of SEE:
http:// see.hcmiu.edu.vn

Fanpage of SEE:
https://www.facebook.com/see.hcmiu.edu.vn/

Tel:
(+84) 283 7244 270 Ext: 3231

Hotline (Zalo):
(+84) 836 870 095