VIETNAM NATIONAL UNIVERSITY – HO CHI MINH CITY
INTERNATIONAL UNIVERSITY
School of Electrical Engineering
Department of Control Engineering and Automation

PROGRAM SPECIFICATION

PROGRAM LEVEL

BACHELOR OF ENGINEER (B.ENG.) IN CONTROL ENGINEERING AND AUTOMATION

2022

Contents

PREFACE

The School of Electrical Engineering (SEE) was established in 2004 by the decision of the International University (IU) – Vietnam National University Ho Chi Minh City (VNU HCMC), and the Control Engineering and Automation (CEA) program had the first recruitment in 2014. The major fields of the CEA consist of Industrial Process Control and Automation, Robotics, Control Applications, Vision and AI.

The CEA program is rapidly growing in recent years. To meet the vision of the university, we have strived to become a high quality and research-oriented school. Our program provides the students with a dynamic learning environment and the opportunity to collaborate with on-going research projects. The mission and vision of the SEE as well as CEA program have been developed with a participant from industry, staff, students, and alumni are published at the following URL: (*http://see.hcmiu.edu.vn/home-en-gb/mission-objectives*).

The CEA program is updated and improved continuously based on feedback from stakeholders and labor market trends. The changes in curriculum of program are summarized as follows.

Academic year	**Details of amendment**
Semester II, 2015-2016	• Change Material Science & Engineering (EEAC001IU): from semester I, 1st year to semester I, 2nd year. • Change Signals & Systems: Lecture (EE088IU) + Lab (EE089IU) from semester I, 2nd year to semester I, 3rd year. • Change Digital Signal Processing: Lecture (EE092IU) + Lab (EE093IU) from semester I, 3rd year to semester II, 3rd year.
Semester II, 2015-2016	• Change Embedded Real-time Systems (EE104IU-3 credits) + Lab (EE118IU-1 credit) from required course to elective course. • Change Power System and Equipment (EEAC013IU- 3 credits) from elective course to required course. • Update Mathematics for Engineers (EEAC002IU) from 3 credits to 4 credits. • Add 2 more elective courses: Image processing & Lab (EE103IU – 3 credits & EE122IU – 1 credit), Stochastic Signal Processing (EE102IU – 3 credits)

Semester II, 2016-2017	• Add Applied Linear Algebra (MA027IU-2 credits) in semester I, 1st year • Update Theory of Automatic Control (EE057IU) from 3 credits to 4 credits. • Add 2 more elective courses: Advanced Control Engineering (EEAC018IU-3 credits), and System Diagnostic (EEAC019IU-3 credits). • Update Theory of Automatic Control (EE075IU) is prerequisite of Advanced Control Engineering (EEAC018IU). • Update Digital Logic Design (EE053IU) is prerequisite of Programmable Logic Control (EEAC006IU).
Semester II, 2018-2019	• Change Power Electronics + Lab (EE079IU- 3 credits+ EEAC003IU- 1 credit) from required course to elective course. • Add 2 more required courses: Capstone 1 (EE130IU -2 credits) & Capstone 2 (EE131IU-2 credits). • Add 2 more elective courses: Machine Learning And Artificial Intelligence (EE127IU-3 credits).
Semester I, 2019-2020	• Add a required course: Engineering Ethics and Professional Skills (PE020IU -3 credits) • Add an elective course: Emerging Engineering Technologies (EE133IU-3 credits) • Update elective courses from 12 credits to 16 credits • Update CEA curriculum from 144 credits to 152 credits

PROGRAM SPECIFICATION

1. INTRODUCTION

a) Vision

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:
  - ✓ To provide students fundamental and advanced theories and link them to engineering application.
  - ✓ To interact with students both inside and outside classrooms.
  - ✓ To support students with blended teaching.
  - ✓ To inspire students to engage research and solve technical problems.
- State-of-The-Art research:
  - ✓ To build the modern laboratories involved in research areas of the school and foster students to join.
  - ✓ To prepare the academic curriculum involved in research.
- Innovation:
  - ✓ To guide students to comprehend the social, economic, and technical contexts.
  - ✓ To direct students to recognize current and future problems.
  - ✓ To teach students the creation and critical thinking.
  - ✓ To foster students to work in teams for integrated problems

b) Mission

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

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

c) Objectives

SEE developed its Program Educational Objectives (PEOs) and posted on the EE School website at (http://see.hcmiu.edu.vn/home-en-gb/mission-objectives)

The SEE, IU – VNU HCMC educates graduates with highly specialized knowledge and skills to:

(1) Be a capable Engineer who may contribute in different areas of Electrical and Electronic industries

(2) Be engaged in lifelong learning and researching to adapt rapid changes in global economic and technologies

(3) Serve efficiently the community, society, and industry in an ethical and responsible manner

(4) Have professional working style and leadership

d) Program

- Language: English
- Types of Program: the CEA program requires students to spend four years of study at IU and it offers students with a degree awarded by IU-VNU once completing the program. (IU program)

e) Qualification

- The Bachelor Degrees are awarded by International University (IU) – Vietnam National University Ho Chi Minh City (VNUHCM)
- Degree title: "Control Engineering and Automation"

2. PROGRAM LEARNING OUTCOMES

The School of Electrical Engineering, International University, Vietnam National University HCMC uses the Student Outcomes from 1 to 7 based on ABET student outcomes (version 2021-2022). The Student Outcomes are also published at the School website http://see.hcmiu.edu.vn/current-students/student-outcomes-abet, Student's handbook, and all course syllabi.

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

3. THE PROGRAM OBJECTIVES

3.1 Consistency of the Program Educational Objectives (PEOs) with the Mission of the Institution

The PEOs correlate well with the university mission. The PEOs #1 and #3 supports graduates for knowledge and needed skills used to contribute to the development and industrialization of Vietnam. The PEOs #2 and #3 allow the graduates to continue and update their knowledge and necessary skills to carry out research for serving society and industry in ethical and responsible manner. The PEO #4 helps graduate achieve professional working style and leadership. Table 3.1 shows the consistency of the PEOs with the mission of the institution.

Table 3.1 The Consistency of the PEOs with the Mission of the Institution

University Mission	**PEO#1**	**PEO#2**	**PEO#3**	**PEO#4**
To become an international higher education institution with a Vietnamese cultural identity;	x		x	x
To offer higher education programs in a wide range of areas, all accredited by regional and international accreditation organizations;	x	x	x	
To enhance internationalization by using English as the medium of instruction. Students are trained to become global citizens with a high self-awareness of their social responsibility for a long-term, sustainable development;		x		x
To pursue excellence in basic and applied research in order to meet the demand for innovative and sustainable development of industries, provinces and regions; to promote connectiveness by means of collaboration activities and social services.	x	x		

The SEE mission is also connected with the PEOs such as “to educate graduates who are instructed deeply and broadly in specialized techniques and social responsibility in the context of the rapid global development of technology.”

3.2. Program Constituencies

The PEOs of the CAE program are decided and judged with a careful consultation of four core constituents: Students, Alumni, Industry, and Faculty. The process of design, determination, and evaluation of PEOs through the constituents will reflect the needs of constituents.

a) Students

The needs of student are collected through the regular meeting (twice per semester) between Advisors and Students, annual welcome meeting between faculty and students, annual exit surveys with graduating students, irregular meeting between students and board of Dean, and student evaluation at every semester.

b) Alumni

Alumni feedbacks are surveyed through the survey form, discussions with alumni representatives from the school alumni list. The surveys are also carried out with current graduate students who have a bachelor's degree from IU – VNU HCMC.

c) Faculty

Faculty inputs are obtained through bi-monthly school meetings, weekly extended Board of Dean meetings, specialized committee meetings, bi-annually course evaluation of faculty. If the faculty recommends revising the PEOs, the proposals suggested by the faculty will be sent to other stakeholders for discussion. Finally, the PEOs will be voted by the faculty.

d) Industry

School Advisory Council (SAC) was established in order to advise the PEOs, quality of education and academic curriculum. Representatives from industry are also the members of the board. The academic board meeting is organized at the end of the academic year or by request, and the recommendation of the industrial representatives is considered as the input of Industry.

Moreover, Industry input is also obtained through employer surveys (via alumni). The selective employers who were surveyed include Renesas Vietnam, Global Cybersoft, Jabil Vietnam, Bosch Vietnam, Arrive Technology Vietnam, FPT Software Vietnam, Intel, Verification, and Certification Center 2, Samsung Vietnam.

4. JOB OPPORTUNITIES

Students who graduate from CEA have great chances to:

- Design and management engineering of production lines in factories
- Software engineering includes designing and programming chip, embedded programming applications for mobile phones, car, and smart devices
- Sales engineering and field engineering specialized in installation, maintenance, and management
  - Instrument related to control and automation filed, measurement, and smart control
  - Control and monitoring systems (PLCs and SCADA)
  - Industrial and autonomous robotics

5. PROGRAM OFFERING

a) *Awarding body/institution:* International University HCMC
b) *Teaching institution*: School of Electrical engineering –Control Engineering and Automation Department
c) Accreditation:
Institutional level: AUN (2013) for EE program
ABET (2018) for EE program

d) Name of the final award:
e) *Program Title:* Bachelor of engineer (B.Eng.) in control engineering and automation
f) Admission criteria of the program:

6. TEACHING AND LEARNING APPROACH

Lectures are delivered in an appropriate mix of assignments, seminars, labs or internships, projects, capstone design, and more.

Project-based instruction is used to effectively develop key skills while gaining curriculum content knowledge. The project's topics are related to current real-life issues, using advanced technical technology for daily life as well as industrial applications.

Projects, analysis and design work are carried out in the direction of cooperative learning, where students are grouped together to improve attention and mutual understanding. Each team member will have a specific role and to achieve a common goal, it is necessary to interact and work in sync.

The capstone design is for 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 work in multidisciplinary teams to complete an approved engineering design projects that is fully documented and prototyped. In the Capstone Design Project 1, 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. Each team is comprised of two to four students. In addition, the Capstone Design Project 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 proposed design specifications.

Internship is required before final thesis registration. This is an opportunity for students to learn in professional practice and their first approach to the industrial labor market. Students have to work at their chosen company for at least 08 weeks and are supervised by the company. Students can stay at university during internship if they prefer doing research. After completing the internship, most students have ideas for their final thesis and intention for future career.

The final thesis is required for graduation. It takes at least a year to finish and is divided into two sections: the senior project and thesis. In the senior project, students will form a research idea and review all related knowledge. Then, the idea will come up with solution by proved theory, software simulation or hardware implementation during the thesis. The requirements and scope of the project ensure that students work independently on a scientific and technical topic in the field of control and automation. Students will apply scientific methods and open approaches to the appropriate level of knowledge to achieve the original goal.

7. STUDENT ASSESSMENT

The curriculum of the CEA undergraduate program was designed to give students a solid science and engineering foundation, with emphasis on scientific research, practical skills, and a multidisciplinary approach. The assessment methods covering those objectives include:

- Midterm exams, final exams, quizzes, and homework assignments, to assess the basic science and engineering knowledge;
- Lab performance evaluation, to assess practical skills;
- Project results to assess research skills and capability of working independently; and
- Internship, senior project, and thesis evaluations, which assess all of the above objectives.

7.1 Course Assessment

These assessments include midterm exams, final exams, labs, quizzes, homework assignments and project presentations, and are applied in each course. Direct assessment includes quizzes, assignments, midterm exam and final exam. These assessments use different kinds of questions such as multiple choice, essays, or written tests. The laboratory assessments require students to perform experiments and report on the experimental results. The midterm and final examinations follow the IU's format.

The criteria to assess students' performance are clearly indicated in the syllabus distributed at the beginning of the course and posted on the course Blackboard. At the beginning of the course, the instructor informs students of assessment criteria for the student progress towards course outcomes.

The course grades are collected using the EduSoft software, which computes the Grade Point Average (GPA) and used for evaluating student's performance. There are two types of GPA:

- Semester GPA: is the weighted average grade of all the subjects a student has registered during a particular semester. The semester GPA is used as a criterion for awarding scholarships.
- Cumulative GPA: is the weighted average grade of all the subjects that a student has registered for the whole period of his/her study. Cumulative GPA is used for evaluating a student's performance and graduation.

The assessment criteria for each course are based on the content of that course, to achieve the course outcomes. The course outcomes, in turn, are designed and improved upon by instructors of the course, to achieve the program outcomes. In other words, the criteria for course assessment reflect the course outcomes that in turn reflect the program outcomes.

7.2 Senior Project and Thesis Assessment

The senior project is the prerequisite to the thesis in order to provide students with essential research skills and knowledge for the completion of the thesis. During the senior project, they must achieve preliminary research results as well as literature backgrounds for assigned topics before continuing with their thesis. The thesis is performed within one semester after completing the senior project.

For completing the senior project or thesis, the students are required to defend their works and obtain the committee's evaluation. Before presenting in front of the senior project or thesis examination committee, a student must obtain a favorable recommendation from his/her thesis advisor. If there are disagreements between them, the Dean of the School will be consulted to find a solution. If a student fails at the senior project or thesis presentation, he/she must repeat the whole process. In any case, the duration of the entire study cannot exceed the permitted time, which is six years, determined by IU – VNU HCMC rules.

The criteria for assessing the course senior project and thesis are clearly stated in the evaluation form. The students must achieve the average grade of at least 50/100 from the committee in order to pass the senior project or thesis examinations. Besides the faculty members of the School, the member of the thesis committee evaluation may include the faculty members from other IU – VNU HCMC units and other universities.

7.3 Internship Assessment

Each student is supervised by one advisor from the intern organization. At the end of the internship, they submit their reports and present what they have learned from the companies and institutions.

The committee assigned by SEE evaluates the student's performance. The average grade of committee members is the final grade of the internship.

7.4 Exit Assessment

For graduation, students are required to complete the entire curriculum, obtain IELTS score ≥ 5.5 or equivalents, and accomplish the military training duty. Every semester, the Office of Academic Affairs (OAA) prepares a list of potential candidates for graduation which is reviewed by the School. The university committee discusses and gives its approval

7.5 Grading

Students' overall performance throughout the semester is formally monitored through course grades which are at least 50 (maximum score of 100) to pass each course (see Table 3.1).

Table 7.1: Grading Criteria

Grade Level	100 Point Grading Scale	Grading Scale in letters	4-Point Grading Scale
Excellent	90≤ GPA ≤100	A+	4.0
Very Good	80≤ GPA <90	A	3.5
Good	70≤ GPA <80	B+	3.0
Average Good	60≤ GPA <70	B	2.5
Ordinary	50≤ GPA <60	C	2

Notes:

To earn the grade level "Excellent" or "Very Good," a student must not only obtain the required GPA as indicated above but also must satisfy the following conditions; otherwise, he/she will be downgraded to one level lower:

A) The total time until graduation is not higher than the regular requirement (6 years).

B) If a student re-took the same courses more than once, the total credits of these courses must not be higher than 5% (i.e., 7 credits) of the total of the regular requirements (i.e., 152 credits).

C) During the study time, the student must not receive an academic punishment of Warning or higher from IU.

According to the regulations of IU, the weightings for1 calculating course grades are as follows:

- Midterm exam: 20%-30%
- Final exam: 40%-60%
- Others (quizzes, homework assignments, projects, etc.): 20%-30%

The weightings for the final grade of a laboratory course are:

- Laboratory assignment: 70% - 80%
- Laboratory final exam: 20% - 30%

If a student is not satisfied with the scores, he/she can ask for a re-assessment.

If the performance of a student does not meet the minimum requirements, the academic advisor will first discuss with the student and his/her peer advisor to understand the situation and give advice to the student. If the situation is not improved in the following semester, the advisor will bring the case to the School/Department who will decide the actions to be taken.

8. PROGRAM STRUCTURE

The structure of the CEA undergraduate curriculum consists of four main modules:

1. General Education (31 credits)
2. Mathematics and Basic Sciences (30 credits)
3. Core Major (75 credits)
4. Elective courses (16 credits)

The CEA Program has 152 credits including 31 credits of General Education, 30 credits of Math & Basic Science and 91 credits of CEA Engineering Discipline (Core Major and 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.

a) General Education

General Education consist of 4 groups given in Table 8.1. Group 1 and Group 2 having 11 credits in General Education are extra-curriculum activities. Group 3 are mainly focused on academic listening and scientific writing skills. It runs by Department of English to bridge the English gaps of Vietnamese students. Group 4 provides students with the logical reasoning, how to start-up a business, ethics and a broader education. Courses are given by other School and IU's Department. 20 credits from Group 3 and Group 4 are used to enhance soft skills of our students.

Table 8.1: List of General Education Courses

Description	**Credits**
Group 1 - Political Education - PE015IU – Philosophy of Marxism and Leninism - PE016IU - Political economics of Marxism and Leninism - PE018IU - History of Vietnamese Communist Party - PE017IU - Scientific socialism - PE019IU – Ho Chi Minh's Though	11
Group 2 - Extra courses (non-counting) - PT001IU - Physical Training 1 - PT002IU - Physical Training 2 - Military Training	0
Group 3- English Proficiency - EN007IU - Writing AE1 - EN008IU - Listening AE1 - EN011IU - Writing AE 2	8

- EN012IU - Speaking AE2	
Group 4 - Social Science & General Elective - PE008IU - Critical Thinking - EE114IU – Entrepreneurship - PE020IU – Engineering Ethics and Professional Skills - General elective (*)	12
Total (credits)	**31**

b) Mathematics and Basic Sciences

Our program is solidly built on 30 credits of mathematics and basic science as listed in the Table 8.2. The Department of Mathematics provides all mathematics topics ranging from functional analysis, series, and complex number to the advanced one such as linear algebra, differential equation, and probability. In addition, the Department of Physics is responsible for providing the antecedent to all the Physics and laboratories, The Mathematics and Basic Sciences

Table 8.2: List of Mathematics and Basic Science Courses

Description	**Credits**
Mathematics - MA001IU - Calculus 1 - MA003IU - Calculus 2 - MA027IU - Applied Linear Algebra - MA024IU - Differential Equations - MA026IU - Probability & Random Process - EEAC026IU - Mathematics for Engineers	21
Basic Sciences	9

- PH013IU - Physics 1 (Mechanics) - PH014IU - Physics 2 (Thermodynamics) - PH012IU - Physics 4 (Optics & Atomics) - EEAC001IU - Materials Science & Engineering	
Total (credits)	**30**

c) Core Major and Elective courses

The SEE runs the core major and elective courses of CEA program which accounts for 91 credits. The core major courses provide the foundation of the CEA engineering. Students are trained with basic skills for the major such as programming, conducting experiments, forming and solving basic electrical and control problems. The list of major courses is given in Table 8.3.

Table 8.3: List of Courses running by SEE

Description	**Credits**
Core major	**75**
- EE049IU Introduction to EE - EE050IU Intro to Computer for Engineers - EE051IU Principles of EE 1 - EE052IU Principles of EE 1 Lab - EE053IU Digital Logic Design - EE054IU Digital Logic Design Lab - EE057IU Programming for Engineers - EE058IU Programming for Engineers Lab - EE010IU Electromagnetic Theory - EE055IU Principles of EE 2 - EE056IU Principles of EE 2 Lab - EE090IU Electronics Devices - EE091IU Electronics Devices Lab - EE088IU Signals & Systems	

- EE089IU Signals & Systems Lab - EE083IU Micro-processing Systems - EE084IU Micro-processing Systems Lab - EEAC020IU Theory of Automatic Control - EE130IU Capstone Design 1 - EE092IU Digital Signal Processing - EE093IU Digital Signal Processing Lab - EEAC004IU PC Based Control and SCADA System - EEAC005IU PC Based Control and SCADA System Lab - EEAC006IU Programmable Logic Control - EEAC007IU Programmable Logic Control Lab - EEAC008IU Sensors and Instrumentation - EE131IU Capstone Design 2 - EE112IU Summer Internship - EE107IU Senior Project - EE097IU Thesis	
Elective courses (16/ 60 credits)	**16**
- EE061IU Analog Electronics - EE062IU Analog Electronics Laboratory - EEAC011IU Automation Manufacturing System and Technique - EEAC012IU Automation Manufacturing System and Technique Lab - EEAC013IU Power System and Equipment - EEAC014IU Neuron Network and Fuzzy Logics - EEAC015IU Robotics - EEAC016IU Industrial Electronics - EEAC017IU Digital Control - EEAC009IU Electric Safety	

- EEAC010IU Electric Machine - EE102IU Stochastic Signal Processing - EE104IU Embedded Real-time System - EE118IU Embedded Real-time System Lab - EE103IU Image Processing - EE122IU Image Processing Lab - EEAC018IU Advanced Control Engineering - EEAC019IU System Diagnostic - EE068IU Principles of Communication - EE115IU Principles of Communication Laboratory - EE127IU Machine learning and Artificial Intelligence - EE133IU Emerging Engineering Technologies - EE079IU Power Electronics - EEAC001IU Power Electronics Laboratory	

Once completed the core major portion, students will choose their specialization in CEA. Currently, the program offers four major specializations, which are Industrial Process Control and Automation, Robotics, Control Applications, Vision and AI. Each specialization has both required and elective courses. The list of courses is given in Table 8.3. Finally, students complete their undergraduate studies with either internship program in a company (professional practice) or a research project conducted at the university.

9. CURRICULUM

9.1 Distribution of CEA curriculum_batch (2015 and 2016)

- **Academic English (AE1)**

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
PH013IU	Physics 1 (Mechanics)	2	PE008IU	Critical Thinking	3
EEAC001IU	Materials Science & Engineering	3	PH014IU	Physics 2 (Thermodynamics)	2

PE011IU	Principles of Marxism	5	PE012IU	Ho Chi Minh's Thought	2
EN007IU	Writing AE1	2	EN011IU	Writing AE 2	2
EN008IU	Listening AE1	2	EN012IU	Speaking AE2	2
EE049IU	Introduction to EE	3	EE050IU	Intro to Computer for Engineers	3
PT001IU	Physical Training 1	3	PT002IU	Physical Training 2	3
	Total Credits	*21*		*Total Credits*	*18*
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
EEAC002IU	Mathematics for Engineers	3	MA024IU	Differential Equations	4
MA026IU	Probability, Statistic & Random Process	3	EE088IU	Signals & Systems	3
PH012IU	Physics 4 (Optics & Atomics)	2	EE089IU	Signals & Systems Lab	1
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Laboratory	1
EE054IU	Digital Logic Design Laboratory	1	EE090IU	Electronics Devices	3
EE057IU	Programming for Engineers (C)	3	EE091IU	Electronics Devices Lab	1
EE058IU	Programming for Engineers Lab	1	PE013IU	Revolutionary Lines of VCP	3
	Total Credits	*20*		*Total Credits*	*22*
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE092IU	Digital Signal Processing	3	EE104IU	Embedded Real-time Systems	3
EE093IU	Digital Signal Processing Lab	1	EE118IU	Embedded Real-time Systems Lab	1
EE083IU	Micro-processing Systems	3	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EE075IU	Theory of Automatic Control	3	EEAC006IU	Programmable Logic Control (PLC)	3
EE079IU	Power Electronics	3	EEAC007IU	Programmable Logic Control (PLC) Lab	1
EEAC003IU	Power Electronics Lab	1	EEAC008IU	Sensors and Instrumentation	3
	General Elective	3	EEAC___IU	AC Elective Course	3
	Total Credits	*18*		*Total Credits*	*18*
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC___IU	AC Elective Course	3			
EEAC___IU	AC Elective Course	3			
EEAC___IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	14		*Total Credits*	10

Total: 144 credits

➢ Intensive English 2 (IE2)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
EN074IU	Reading & Writing IE2	0	MA003IU	Calculus 2	4
EN075IU	Listening & Speaking IE2		PH013IU	Physics 1 (Mechanics)	2
MA001IU	Calculus 1	4	PE011IU	Principles of Marxism	5
			EN007IU	Writing AE1	2
			EN008IU	Listening AE1	2
			EE050IU	Intro to Comp. for Engineers	3
			PE008IU	Critical Thinking	3
PT001IU	Physical Training 1	3	PT002IU	Physical Training 2	3
	Total Credits	*4*		*Total Credits*	*21*
Summer Semester					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
PE012IU	Ho Chi Minh's Thought	2	EN012IU	Speaking AE2	2
				Total Credits	*8*
Sophomore Year (2nd year)					
Semester 1			*Semester 2*		
PE013IU	Revolutionary Lines of VCP	3	PH012IU	Physics 4 (Optics & Atomics)	2
EEAC002IU	Mathematics for Engineers	3	MA024IU	Differential Equations	4
EEAC001IU	Materials Science & Engineering	3	MA026IU	Probability, Statistic & Random Process	3
EE049IU	Introduction to EE	3	EE088IU	Signals & Systems	3
EE051IU	Principles of EE 1	3	EE089IU	Signals & Systems Lab	1
EE052IU	Principles of EE 1 Lab	1	EE010IU	Electromagnetic Theory	3
EE053IU	Digital Logic Design	3	EE055IU	Principles of EE 2	3
EE054IU	Digital Logic Design Laboratory	1	EE056IU	Principles of EE 2 Laboratory	1
EE057IU	Programming for Engineers (C)	3	EE090IU	Electronics Devices	3
EE058IU	Programming for Engineers Lab	1	EE091IU	Electronics Devices Lab	1
	Total Credits	24		*Total Credits*	24
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EE092IU	Digital Signal Processing	3	EE104IU	Embedded Real-time Systems	3
EE093IU	Digital Signal Processing Lab	1	EE118IU	Embedded Real-time Systems Lab	1
EE083IU	Micro-processing Systems	3	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EE075IU	Theory of Automatic Control	3	EEAC006IU	Programmable Logic Control (PLC)	3
EE079IU	Power Electronics	3	EEAC007IU	Programmable Logic Control (PLC) Lab	1
EEAC003IU	Power Electronics Lab	1	EEAC008IU	Sensors and Instrumentation	3
	General Elective	3	EEAC___IU	AC Elective Course	3
	Total Credits	18		*Total Credits*	18

Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC___IU	AC Elective Course	3			
EEAC___IU	AC Elective Course	3			
EEAC___IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	14		*Total Credits*	10

Total: 144 credits

- **Intensive English 1 (IE1)**

Freshman Year					
Semester 1			*Semester 2*		
EN072IU	Reading & Writing IE1	0	EN074IU	Reading & Writing IE2	0
EN073IU	Listening & Speaking IE1		EN075IU	Listening & Speaking IE2	
			MA001IU	Calculus 1	4
PT001IU	Physical Training 1	3	PT002IU	Physical Training 2	3
	Total Credits			*Total Credits*	*4*
Summer Semester					
MA003IU	Calculus 2	4	EN007IU	Writing AE1	2
PH013IU	Physics 1 (Mechanics)	2	EN008IU	Listening AE1	2
				Total Credits	10
Sophomore Year					
Semester 1			*Semester 2*		
PE011IU	Principles of Marxism	5	PE013IU	Revolutionary Lines of VCP	3
EEAC002IU	Mathematics for Engineers	3	PH012IU	Physics 4 (Optics & Atomics)	2
EEAC001IU	Materials Science & Engineering	3	MA024IU	Differential Equations	4
PH014IU	Physics 2 (Thermodynamics)	2	EE050IU	Intro to Computer for Engineers	3
EN011IU	Writing AE 2	2	EE088IU	Signals & Systems	3
EN012IU	Speaking AE2	2	EE089IU	Signals & Systems Lab	1
EE049IU	Introduction to EE	3	EE010IU	Electromagnetic Theory	3
EE051IU	Principles of EE 1	3	EE055IU	Principles of EE 2	3
EE052IU	Principles of EE 1 Lab	1	EE056IU	Principles of EE 2 Laboratory	1
	Total Credits	24		*Total Credits*	23
Summer Semester					
PE012IU	Ho Chi Minh's Thought	2	PE008IU	Critical Thinking	3

MA026IU	Probability, Statistic & Random Process	3			
				Total Credits	8
			Junior Year		
Semester 1			*Semester 2*		
EE053IU	Digital Logic Design	3	EE079IU	Power Electronics	3
EE054IU	Digital Logic Design Laboratory	1	EEAC003IU	Power Electronics Lab	1
EE057IU	Programming for Engineers (C)	3	EE104IU	Embedded Real-time Systems	3
EE058IU	Programming for Engineers Lab	1	EE118IU	Embedded Real-time Systems Lab	1
EE090IU	Electronics Devices	3	EEAC004IU	PC Based Control and SCADA System	3
EE091IU	Electronics Devices Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EE092IU	Digital Signal Processing	3	EEAC006IU	Programmable Logic Control (PLC)	3
EE093IU	Digital Signal Processing Lab	1	EEAC007IU	Programmable Logic Control (PLC) Lab	1
EE075IU	Theory of Automatic Control	3	EEAC008IU	Sensors and Instrumentation	3
EE083IU	Micro-processing Systems	3	EEAC___IU	AC Elective Course	3
EE084IU	Micro-processing Systems Lab	1			
	Total Credits	23		*Total Credits*	22
Summer Semester					
EE112IU	Summer Internship	3			
			Senior Year		
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EE—IU	AC Elective Course	3			
EE—IU	AC Elective Course	3			
EE—IU	AC Elective Course	3			
	General Elective	3			
EE114IU	Entrepreneurship	3			
	Total Credits	17		*Total Credits*	10

Total: 144 credits

➢ List of AC Elective Courses

Students have to take at least 4 courses from 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	2
EEAC010IU	Electric Machine	3
EE104IU	Embedded Real-time Systems	3
EE118IU	Embedded Real-time Systems Laboratory	1
EE102IU	Stochastic Signal Processing	3
EE103IU	Image Processing	3
EE122IU	Image Processing Laboratory	1
EEAC018IU	Advanced Control Engineering	3
EEAC019IU	System Diagnostic	3
EE068IU	Principles of Communication	3
EE115IU	Principles of Communication Laboratory	1
EE127IU	Machine Learning and Artificial Intelligence	3

- **List of General Courses**

Students have to take at least 3 credits from following list

IS026IU	Project Management	3
IS033IU	Multi-Criteria Decision Making	3
IS061IU	Information systems in Supply chain	3
IS045IU	Leadership	3
IS019IU	Production Management	3
BA003IU	Principles Of Marketing	3
BA006IU	Business Communication	3
BA020IU	Business Ethics	3
BA197IU	Introduction to Sociology	3
BA130IU	Organizational Behavior	3
BA167IU	Introduction to Vietnamese Legal System	3
BA169IU	Management Information System	3
EE072IU	Computer and Communication Network	3
IT094IU	Information System Management	4
IT063IU	Theoretical Models in Computing	4

9.2 Distribution of CEA curriculum_batch 2017

➢ Academic English (AE1)

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
PE011IU	Principles of Marxism	5	PE008IU	Critical Thinking	3
EN007IU	Writing AE1	2	PH014IU	Physics 2 (Thermodynamics)	2
EN008IU	Listening AE1	2	PE012IU	Ho Chi Minh's Thought	2
EE049IU	Introduction to EE	3	EN011IU	Writing AE 2	2
			EN012IU	Speaking AE2	2
			EE050IU	Intro to Computer for Engineers	3
PT001IU	Physical Training 1	3	PT002IU	Physical Training 2	3
	Total Credits	18		*Total Credits*	20
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
PE013IU	Revolutionary Lines of VCP	3	PH012IU	Physics 4 (Optics & Atomics)	2
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Laboratory	1
EE054IU	Digital Logic Design Laboratory	1	EE090IU	Electronics Devices	3
EE057IU	Programming for Engineers (C)	3	EE091IU	Electronics Devices Lab	1
EE058IU	Programming for Engineers Lab	1			
	Total Credits	22		*Total Credits*	20
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control (PLC)	3
EE079IU	Power Electronics	3	EEAC007IU	Programmable Logic Control (PLC) Lab	1
EEAC003IU	Power Electronics Lab	1	EEAC008IU	Sensors and Instrumentation	3
	General Elective (*)	3	EEAC___IU	AC Elective Course (***)	3
	Total Credits	19		*Total Credits*	18
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
mester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC___IU	AC Elective Course	3			
EEAC___IU	AC Elective Course	3			
EEAC___IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	14		*Total Credits*	10

Total: 144 credits

➢ Intensive English 2 (IE2)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
EN074IU	Reading & Writing IE2	0	EN007IU	Writing AE1	2
EN075IU	Listening & Speaking IE2		EN008IU	Listening AE1	2
			PE008IU	Critical Thinking	3
			PE011IU	Principles of Marxism	5
			PH013IU	Physics 1 (Mechanics)	2
			EE049IU	Introduction to EE	3
PT001IU	Physical Training 1	3	PT002IU	Physical Training 2	3
	Total Credits	4		*Total Credits*	21
Summer Semester					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
PE012IU	Ho Chi Minh's Thought	2	EN012IU	Speaking AE2	2
MA027IU	Applied Linear Algebra	2			
				Total	*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
PE013IU	Revolutionary Lines of VCP	3	PH012IU	Physics 4 (Optics & Atomics)	2
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Laboratory	1
EE054IU	Digital Logic Design Laboratory	1	EE090IU	Electronics Devices	3
EE057IU	Programming for Engineers (C)	3	EE091IU	Electronics Devices Lab	1
EE058IU	Programming for Engineers Lab	1	EE050IU	Intro to Computer for Engineers	3
	Total Credits	22		*Total Credits*	23
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control (PLC)	3
EE079IU	Power Electronics	3	EEAC007IU	Programmable Logic Control (PLC) Lab	1
EEAC003IU	Power Electronics Lab	1	EEAC008IU	Sensors and Instrumentation	3
	General Elective	3	EEAC___IU	AC Elective Course (***)	3
	Total Credits	19		*Total Credits*	18
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC_IU	AC Elective Course	3			
EEAC_IU	AC Elective Course	3			
EEAC_IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			

	Total Credits	14		*Total Credits*	10

Total: 144 credits

- **Intensive English 1 (IE1)**

Freshman Year (1st year)					
Semester 1			*Semester 2*		
EN072IU	Reading & Writing IE1	0	EN074IU	Reading & Writing IE2	0
EN073IU	Listening & Speaking IE1		EN075IU	Listening & Speaking IE2	
			MA001IU	Calculus 1	4
PT001IU	Physical Training 1	3	PT002IU	Physical Training 2	3
	Total Credits			*Total Credits*	*4*
Summer Semester					
MA003IU	Calculus 2	4	EN007IU	Writing AE1	2
PH013IU	Physics 1 (Mechanics)	2	EN008IU	Listening AE1	2
				Total	*10*
Sophomore Year (2nd year)					
MA027IU	Applied Linear Algebra	2	MA026IU	Probability& Random Process	3
EEAC021IU	Mathematics for Engineers	4	PE013IU	Revolutionary Lines of VCP	3
PH014IU	Physics 2 (Thermodynamics)	2	EE053IU	Digital Logic Design	3
PE011IU	Principles of Marxism	5	EE054IU	Digital Logic Design Laboratory	1
EN011IU	Writing AE 2	2	EE055IU	Principles of EE 2	3
EN012IU	Speaking AE2	2	EE056IU	Principles of EE 2 Laboratory	1
EE049IU	Introduction to EE	3	EE057IU	Programming for Engineers (C)	3
EE051IU	Principles of EE 1	3	EE058IU	Programming for Engineers Lab	1
EE052IU	Principles of EE 1 Lab	1	EE010IU	Electromagnetic Theory	3
			EE050IU	Intro to Computer for Engineers	3
	Total Credits	*24*		*Total Credits*	*24*
Summer Semester					
MA024IU	Differential Equations	4	PE008IU	Critical Thinking	3
PH012IU	Physics 4 (Optics & Atomics)	2	PE012IU	Ho Chi Minh's Thought	2
				Total Credits	*11*
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EEAC001IU	Materials Science & Engineering	3	EE092IU	Digital Signal Processing	3
EE088IU	Signals & Systems	3	EE093IU	Digital Signal Processing Lab	1
EE089IU	Signals & Systems Lab	1	EEAC004IU	PC Based Control and SCADA System	3
EE083IU	Micro-processing Systems	3	EEAC005IU	PC Based Control and SCADA System Lab	1
EE084IU	Micro-processing Systems Lab	1	EEAC006IU	Programmable Logic Control (PLC)	3
EEAC020IU	Theory of Automatic Control	4	EEAC007IU	Programmable Logic Control (PLC) Lab	1
EE090IU	Electronics Devices	3	EEAC008IU	Sensors and Instrumentation	3
EE091IU	Electronics Devices Lab	1	EE079IU	Power Electronics	3
	General Elective (*)	3	EEAC003IU	Power Electronics Lab	1
			EEAC___IU	AC Elective Course (***)	3
	Total Credits	*22*		*Total Credits*	*22*
Junior Year (3rd year)					
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					

Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC___IU	AC Elective Course	3			
EEAC___IU	AC Elective Course	3			
EEAC___IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	14		*Total Credits*	10

Total: 144 credits

- **List of AC Elective Courses**

Students have to take at least 4 courses from 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	2
EEAC010IU	Electric Machine	3
EE104IU	Embedded Real-time Systems	3
EE118IU	Embedded Real-time Systems Laboratory	1
EE102IU	Stochastic Signal Processing	3
EE103IU	Image Processing	3
EE122IU	Image Processing Laboratory	1
EEAC018IU	Advanced Control Engineering	3
EEAC019IU	System Diagnostic	3
EE068IU	Principles of Communication	3
EE115IU	Principles of Communication Laboratory	1
EE127IU	Machine Learning and Artificial Intelligence	3

- **List of General Courses**

Students have to take at least 3 credits from following list

IS026IU	Project Management	3
IS033IU	Multi-Criteria Decision Making	3
IS061IU	Information systems in Supply chain	3
IS045IU	Leadership	3
IS019IU	Production Management	3
BA003IU	Principles Of Marketing	3

BA006IU	Business Communication	3
BA020IU	Business Ethics	3
BA197IU	Introduction to Sociology	3
BA130IU	Organizational Behavior	3
BA167IU	Introduction to Vietnamese Legal System	3
BA169IU	Management Information System	3
EE072IU	Computer and Communication Network	3
IT094IU	Information System Management	4
IT063IU	Theoretical Models in Computing	4

9.3 Distribution of CEA curriculum_batch 2018

- **Academic English (AE1)**

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
PH013IU	Physics 1 (Mechanics)	2	PE008IU	Critical Thinking	3
PE011IU	Principles of Marxism	5	PH014IU	Physics 2 (Thermodynamics)	2
EN007IU	Writing AE1	2	PE012IU	Ho Chi Minh's Thought	2
EN008IU	Listening AE1	2	EN011IU	Writing AE 2	2
EE049IU	Introduction to EE	3	EN012IU	Speaking AE2	2
PT001IU	Physical Training 1	0	MA027IU	Applied Linear Algebra	2
			EE050IU	Intro to Computer for Engineers	3
			PT002IU	Physical Training 2	0
	Total Credits	18		*Total Credits*	20
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
PE013IU	Revolutionary Lines of VCP	3	PH012IU	Physics 4 (Optics & Atomics)	2
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Lab	1
EE054IU	Digital Logic Design Lab	1	EE090IU	Electronics Devices	3
EE057IU	Programming for Engineers	3	EE091IU	Electronics Devices Lab	1
EE058IU	Programming for Engineers Lab	1			
	Total Credits	22		*Total Credits*	20
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
	General Elective	3	EEAC008IU	Sensors and Instrumentation	3
			EE131IU	Capstone Design 2	2

			EEAC--IU	AC Elective Course	3
	Total Credits	17		*Total Credits*	20
		Summer Semester			
EE112IU	Summer Internship	3			
		Senior Year (4th year)			
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC___IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	14		*Total Credits*	10

Total: 144 credits

- **Intensive English 2 (IE2)**

		Freshman Year (1st year)			
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
EN074IU	Reading & Writing IE2	0	EN007IU	Writing AE1	2
EN075IU	Listening & Speaking IE2		EN008IU	Listening AE1	2
PT001IU	Physical Training 1	0	PE008IU	Critical Thinking	3
			PE011IU	Principles of Marxism	5
			PH013IU	Physics 1 (Mechanics)	2
			EE049IU	Introduction to EE	3
			PT002IU	Physical Training 2	0
	Total Credits	4		*Total Credits*	21
		Summer semester			
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
PE012IU	Ho Chi Minh's Thought	2	EN012IU	Speaking AE2	2
MA027IU	Applied Linear Algebra	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
PE013IU	Revolutionary Lines of VCP	3	PH012IU	Physics 4 (Optics & Atomics)	2
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Lab	1
EE054IU	Digital Logic Design Lab	1	EE090IU	Electronics Devices	3
EE057IU	Programming for Engineers	3	EE091IU	Electronics Devices Lab	1
EE058IU	Programming for Engineers Lab	1	EE050IU	Intro to Computer for Engineers	3
	Total Credits	22		*Total Credits*	23
		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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1

EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
	General Elective	3	EEAC008IU	Sensors and Instrumentation	3
			EE131IU	Capstone Design 2	2
			EEAC--IU	AC Elective Course	3
	Total Credits	17		*Total Credits*	20
		Summer Semester			
EE112IU	Summer Internship	3			
		Senior Year (4th year)			
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	14		*Total Credits*	10

Total: 144 credits

➢ Intensive English 1 (IE1)

		Freshman Year (1st year)			
Semester 1			*Semester 2*		
EN072IU	Reading & Writing IE1	0	EN074IU	Reading & Writing IE2	0
EN073IU	Listening & Speaking IE1		EN075IU	Listening & Speaking IE2	
PT001IU	Physical Training 1	0	MA001IU	Calculus 1	4
			PT002IU	Physical Training 2	0
	Total Credits	0		*Total Credits*	4
		Summer semester			
MA003IU	Calculus 2	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*		
MA027IU	Applied Linear Algebra	2	MA026IU	Probability& Random Process	3
EEAC021IU	Mathematics for Engineers	4	PE013IU	Revolutionary Lines of VCP	3
PH014IU	Physics 2 (Thermodynamics)	2	EE053IU	Digital Logic Design	3
PE011IU	Principles of Marxism	5	EE054IU	Digital Logic Design Lab	1
EN011IU	Writing AE 2	2	EE055IU	Principles of EE 2	3
EN012IU	Speaking AE2	2	EE056IU	Principles of EE 2 Lab	1
EE049IU	Introduction to EE	3	EE057IU	Programming for Engineers	3
EE051IU	Principles of EE 1	3	EE058IU	Programming for Engineers Lab	1
EE052IU	Principles of EE 1 Lab	1	EE010IU	Electromagnetic Theory	3
			EE050IU	Intro to Computer for Engineers	3
	Total Credits	24		*Total Credits*	24
		Summer semester			
MA024IU	Differential Equations	4	PE008IU	Critical Thinking	3
PH012IU	Physics 4 (Optics & Atomics)	2	PE012IU	Ho Chi Minh's Thought	2
				Total Credits	11
		Junior Year (3rd year)			
Semester 1			*Semester 2*		

EEAC001IU	Materials Science & Engineering	3	EE092IU	Digital Signal Processing	3
EE088IU	Signals & Systems	3	EE093IU	Digital Signal Processing Lab	1
EE089IU	Signals & Systems Lab	1	EEAC004IU	PC Based Control and SCADA System	3
EE083IU	Micro-processing Systems	3	EEAC005IU	PC Based Control and SCADA System Lab	1
EE084IU	Micro-processing Systems Lab	1	EEAC006IU	Programmable Logic Control	3
EEAC020IU	Theory of Automatic Control	4	EEAC007IU	Programmable Logic Control Lab	1
EE090IU	Electronics Devices	3	EEAC008IU	Sensors and Instrumentation	3
EE091IU	Electronics Devices Lab	1	EE131IU	Capstone Design 2	2
EE130IU	Capstone Design 1	2	EEAC--IU	AC Elective Course	3
	General Elective	3			
	Total Credits	24		*Total Credits*	20
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	14		*Total Credits*	10

Total: 144 credits

- **List of General Elective Courses**

You have to take 01 course from following list

Sub ID	Subjects	Credit(s)
IS026IU	Project Management	3
IS033IU	Multi-Criteria Decision Making	3
IS061IU	Information systems in Supply chain	3
IS045IU	Leadership	3
IS019IU	Production Management	3
BA003IU	Principles Of Marketing	3
BA006IU	Business Communication	3
BA020IU	Business Ethics	3
BA197IU	Introduction to Sociology	3
BA130IU	Organizational Behavior	3
BA167IU	Introduction to Vietnamese Legal System	3
BA169IU	Management Information System	3
EE072IU	Computer and Communication Network	3
IT094IU	Information System Management	4
IT063IU	Theoretical Models in Computing	4

(**) List of AC Elective Courses

You have to take at least 4 courses from following list:

EE061IU	Analog Electronics	3

EE062IU	Analog Electronics Laboratory	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	2
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 EEAC001IU	Power Electronics Power Electronics Laboratory	3 1
EE127IU	Machine Learning and Artificial Intelligence	3

9.4 Distribution of CEA curriculum_batch 2019

- **Academic English (AE1)**

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
PH013IU	Physics 1 (Mechanics)	2	PE008IU	Critical Thinking	3
PE015IU	Philosophy of Marxism and Leninism	3	PH014IU	Physics 2 (Thermodynamics)	2
EN007IU	Writing AE1	2	PE017IU	Scientific socialism	2
EN008IU	Listening AE1	2	EN011IU	Writing AE 2	2
PE016IU	Political economics of Marxism and Leninism	2	EN012IU	Speaking AE2	2
PT001IU	Physical Training 1	0	MA027IU	Applied Linear Algebra	2
			EE049IU	Intro to EE	3
			PT002IU	Physical Training 2	0
	Total Credits	15		*Total Credits*	20
Summer Semester					
EE050IU	Intro to Computer for Engineers	3			
	Total Credits	3			
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
EE051IU	Principles of EE 1	3	PH012IU	Physics 4 (Optics & Atomics)	2
EE052IU	Principles of EE 1 Lab	1	EE010IU	Electromagnetic Theory	3
EE053IU	Digital Logic Design	3	EE055IU	Principles of EE 2	3
EE054IU	Digital Logic Design Lab	1	EE056IU	Principles of EE 2 Lab	1
EE057IU	Programming for Engineers	3	EE090IU	Electronics Devices	3
EE058IU	Programming for Engineers Lab	1	EE091IU	Electronics Devices Lab	1
			PE018IU	History of Vietnamese Communist Party	2
	Total Credits	19		*Total Credits*	22
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
	General Elective	3	EEAC008IU	Sensors and Instrumentation	3
PE020IU	Engineering Ethics and Professional Skills	3	EE131IU	Capstone Design 2	2
PE019IU	Ho Chi Minh's Thoughts	2	EEAC--IU	AC Elective Course	4
	Total Credits	22		*Total Credits*	21
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC___IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	17		*Total Credits*	10

Total: 152 credits

➢ Intensive English 2 (IE2)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
EN074IU	Reading & Writing IE2	0	EN007IU	Writing AE1	2
EN075IU	Listening & Speaking IE2		EN008IU	Listening AE1	2
PT001IU	Physical Training 1	0	PE008IU	Critical Thinking	3
			PE011IU	Principles of Marxism	5
			PH013IU	Physics 1 (Mechanics)	2
			EE049IU	Introduction to EE	3
			PT002IU	Physical Training 2	0
	Total Credits	4		*Total Credits*	21
Summer semester					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
PE012IU	Ho Chi Minh's Thought	2	EN012IU	Speaking AE2	2
MA027IU	Applied Linear Algebra	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	PH012IU	Physics 4 (Optics & Atomics)	2
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Lab	1
EE054IU	Digital Logic Design Lab	1	EE090IU	Electronics Devices	3
EE057IU	Programming for Engineers	3	EE091IU	Electronics Devices Lab	1
EE058IU	Programming for Engineers Lab	1	PE018IU	History of Vietnamese Communist Party	2
	Total Credits	22		*Total Credits*	22
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
	General Elective	3	EEAC008IU	Sensors and Instrumentation	3
PE020IU	Engineering Ethics and Professional Skills	3	EE131IU	Capstone Design 2	2
PE019IU	Ho Chi Minh's Thoughts	2	EEAC--IU	AC Elective Course	4
	Total Credits	22		*Total Credits*	21
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			

EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	17		*Total Credits*	10

Total: 152 credits

➢ Intensive English 1 (IE1)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
EN072IU	Reading & Writing IE1	0	EN074IU	Reading & Writing IE2	0
EN073IU	Listening & Speaking IE1		EN075IU	Listening & Speaking IE2	
PT001IU	Physical Training 1	0	MA001IU	Calculus 1	4
			PT002IU	Physical Training 2	0
	Total Credits	0		*Total Credits*	4
Summer semester					
MA003IU	Calculus 2	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*		
MA027IU	Applied Linear Algebra	2	MA026IU	Probability& Random Process	3
EEAC021IU	Mathematics for Engineers	4	PE008IU	Critical Thinking	3
PH014IU	Physics 2 (Thermodynamics)	2	EE053IU	Digital Logic Design	3
PE015IU	Philosophy of Marxism and Leninism	3	EE054IU	Digital Logic Design Lab	1
EN011IU	Writing AE 2	2	EE055IU	Principles of EE 2	3
EN012IU	Speaking AE2	2	EE056IU	Principles of EE 2 Lab	1
EE050IU	Intro to Computer for Engineers	3	EE057IU	Programming for Engineers	3
EE051IU	Principles of EE 1	3	EE058IU	Programming for Engineers Lab	1
EE052IU	Principles of EE 1 Lab	1	EE010IU	Electromagnetic Theory	3
PE016IU	Political economics of Marxism and Leninism	2	EE049IU	Intro to EE	3
	Total Credits	24		*Total Credits*	24
Summer semester					
MA024IU	Differential Equations	4	PE018IU	History of Vietnamese Communist Party	2
PH012IU	Physics 4 (Optics & Atomics)	2			
				Total Credits	8
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EEAC001IU	Materials Science & Engineering	3	EE092IU	Digital Signal Processing	3
EE088IU	Signals & Systems	3	EE093IU	Digital Signal Processing Lab	1
EE089IU	Signals & Systems Lab	1	EEAC004IU	PC Based Control and SCADA System	3
EE083IU	Micro-processing Systems	3	EEAC005IU	PC Based Control and SCADA System Lab	1
EE084IU	Micro-processing Systems Lab	1	EEAC006IU	Programmable Logic Control	3
EEAC020IU	Theory of Automatic Control	4	EEAC007IU	Programmable Logic Control Lab	1
EE090IU	Electronics Devices	3	EEAC008IU	Sensors and Instrumentation	3
EE091IU	Electronics Devices Lab	1	EE131IU	Capstone Design 2	2
EE130IU	Capstone Design 1	2	EEAC--IU	AC Elective Course	3

PE020IU	Engineering Ethics and Professional Skills	3	PE019IU	Ho Chi Minh's Thoughts	2
			PE017IU	Scientific socialism	2
	Total Credits	24		*Total Credits*	24
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EEAC--IU	AC Elective Course	4
EEAC--IU	AC Elective Course	3	EE097IU	Thesis	10
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	General Elective	3			
	Total Credits	17		*Total Credits*	14

Total: 152 credits

List of General Elective Courses

You have to take 01 course from following list

Sub ID	Subjects	Credit(s)
IS026IU	Project Management	3
IS033IU	Multi-Criteria Decision Making	3
IS061IU	Information systems in Supply chain	3
IS045IU	Leadership	3
IS019IU	Production Management	3
BA003IU	Principles Of Marketing	3
BA006IU	Business Communication	3
BA020IU	Business Ethics	3
BA197IU	Introduction to Sociology	3
BA130IU	Organizational Behavior	3
BA167IU	Introduction to Vietnamese Legal System	3
BA169IU	Management Information System	3
EE072IU	Computer and Communication Network	3
IT094IU	Information System Management	4
IT063IU	Theoretical Models in Computing	4

(**) List of AC Elective Courses

You have to take at least 5 courses (16 credits) from following list:

EE061IU	Analog Electronics	3
EE062IU	Analog Electronics Laboratory	1
EEAC011IU	Automation Manufacturing System and Technique	3
EEAC012IU	Automation Manufacturing System and Technique Lab	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	2
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 EEAC001IU	Power Electronics Power Electronics Laboratory	3 1
EE127IU	Machine Learning and Artificial Intelligence	3
EE133IU	Emerging Engineering Technologies	

9.5 Distribution of CEA curriculum_batch 2020

- **Academic English (AE1)**

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
PH013IU	Physics 1 (Mechanics)	2	PE008IU	Critical Thinking	3
PE015IU	Philosophy of Marxism and Leninism	3	PH014IU	Physics 2 (Thermodynamics)	2
EN007IU	Writing AE1	2	PE017IU	Scientific socialism	2
EN008IU	Listening AE1	2	EN011IU	Writing AE 2	2
PE016IU	Political economics of Marxism and Leninism	2	EN012IU	Speaking AE2	2
PT001IU	Physical Training 1	0	MA027IU	Applied Linear Algebra	2
			EE049IU	Intro to EE	3
			PT002IU	Physical Training 2	0
	Total Credits	15		*Total Credits*	20
Summer Semester					
EE050IU	Intro to Computer for Engineers	3			
	Total Credits	3			
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
EE051IU	Principles of EE 1	3	PH012IU	Physics 4 (Optics & Atomics)	2
EE052IU	Principles of EE 1 Lab	1	EE010IU	Electromagnetic Theory	3
EE053IU	Digital Logic Design	3	EE055IU	Principles of EE 2	3
EE054IU	Digital Logic Design Lab	1	EE056IU	Principles of EE 2 Lab	1
EE057IU	Programming for Engineers	3	EE090IU	Electronics Devices	3
EE058IU	Programming for Engineers Lab	1	EE091IU	Electronics Devices Lab	1
			PE018IU	History of Vietnamese Communist Party	2
	Total Credits	19		*Total Credits*	22
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
	General Elective	3	EEAC008IU	Sensors and Instrumentation	3
PE020IU	Engineering Ethics and Professional Skills	3	EE131IU	Capstone Design 2	2
PE019IU	Ho Chi Minh's Thoughts	2	EEAC--IU	AC Elective Course	4
	Total Credits	22		*Total Credits*	21
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC___IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			

EE114IU	Entrepreneurship	3		
	Total Credits	17	*Total Credits*	10

Total: 152 credits

➢ Intensive English 2 (IE2)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
EN074IU	Reading & Writing IE2	0	EN007IU	Writing AE1	2
EN075IU	Listening & Speaking IE2		EN008IU	Listening AE1	2
PT001IU	Physical Training 1	0	PE008IU	Critical Thinking	3
			PE011IU	Principles of Marxism	5
			PH013IU	Physics 1 (Mechanics)	2
			EE049IU	Introduction to EE	3
			PT002IU	Physical Training 2	0
	Total Credits	4		*Total Credits*	21
Summer semester					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
PE012IU	Ho Chi Minh's Thought	2	EN012IU	Speaking AE2	2
MA027IU	Applied Linear Algebra	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	PH012IU	Physics 4 (Optics & Atomics)	2
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Lab	1
EE054IU	Digital Logic Design Lab	1	EE090IU	Electronics Devices	3
EE057IU	Programming for Engineers	3	EE091IU	Electronics Devices Lab	1
EE058IU	Programming for Engineers Lab	1	PE018IU	History of Vietnamese Communist Party	2
	Total Credits	22		*Total Credits*	22
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
	General Elective	3	EEAC008IU	Sensors and Instrumentation	3
PE020IU	Engineering Ethics and Professional Skills	3	EE131IU	Capstone Design 2	2
PE019IU	Ho Chi Minh's Thoughts	2	EEAC--IU	AC Elective Course	4
	Total Credits	22		*Total Credits*	21
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			

EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	17		*Total Credits*	10

Total: 152 credits

➢ Intensive English 1 (IE1)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
EN072IU	Reading & Writing IE1	0	EN074IU	Reading & Writing IE2	0
EN073IU	Listening & Speaking IE1		EN075IU	Listening & Speaking IE2	
PT001IU	Physical Training 1	0	MA001IU	Calculus 1	4
			PT002IU	Physical Training 2	0
	Total Credits	0		*Total Credits*	4
Summer semester					
MA003IU	Calculus 2	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*		
MA027IU	Applied Linear Algebra	2	MA026IU	Probability& Random Process	3
EEAC021IU	Mathematics for Engineers	4	PE008IU	Critical Thinking	3
PH014IU	Physics 2 (Thermodynamics)	2	EE053IU	Digital Logic Design	3
PE015IU	Philosophy of Marxism and Leninism	3	EE054IU	Digital Logic Design Lab	1
EN011IU	Writing AE 2	2	EE055IU	Principles of EE 2	3
EN012IU	Speaking AE2	2	EE056IU	Principles of EE 2 Lab	1
EE050IU	Intro to Computer for Engineers	3	EE057IU	Programming for Engineers	3
EE051IU	Principles of EE 1	3	EE058IU	Programming for Engineers Lab	1
EE052IU	Principles of EE 1 Lab	1	EE010IU	Electromagnetic Theory	3
PE016IU	Political economics of Marxism and Leninism	2	EE049IU	Intro to EE	3
	Total Credits	24		*Total Credits*	24
Summer semester					
MA024IU	Differential Equations	4	PE018IU	History of Vietnamese Communist Party	2
PH012IU	Physics 4 (Optics & Atomics)	2			
				Total Credits	8
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EEAC001IU	Materials Science & Engineering	3	EE092IU	Digital Signal Processing	3
EE088IU	Signals & Systems	3	EE093IU	Digital Signal Processing Lab	1
EE089IU	Signals & Systems Lab	1	EEAC004IU	PC Based Control and SCADA System	3
EE083IU	Micro-processing Systems	3	EEAC005IU	PC Based Control and SCADA System Lab	1
EE084IU	Micro-processing Systems Lab	1	EEAC006IU	Programmable Logic Control	3
EEAC020IU	Theory of Automatic Control	4	EEAC007IU	Programmable Logic Control Lab	1
EE090IU	Electronics Devices	3	EEAC008IU	Sensors and Instrumentation	3
EE091IU	Electronics Devices Lab	1	EE131IU	Capstone Design 2	2
EE130IU	Capstone Design 1	2	EEAC--IU	AC Elective Course	3

PE020IU	Engineering Ethics and Professional Skills	3	PE019IU	Ho Chi Minh's Thoughts	2
			PE017IU	Scientific socialism	2
	Total Credits	24		*Total Credits*	24
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EEAC--IU	AC Elective Course	4
EEAC--IU	AC Elective Course	3	EE097IU	Thesis	10
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	General Elective	3			
	Total Credits	17		*Total Credits*	14

Total: 152 credits

List of General Elective Courses

You have to take 01 course from following list

Sub ID	Subjects	Credit(s)
IS026IU	Project Management	3
IS033IU	Multi-Criteria Decision Making	3
IS061IU	Information systems in Supply chain	3
IS045IU	Leadership	3
IS019IU	Production Management	3
BA003IU	Principles Of Marketing	3
BA006IU	Business Communication	3
BA020IU	Business Ethics	3
BA197IU	Introduction to Sociology	3
BA130IU	Organizational Behavior	3
BA167IU	Introduction to Vietnamese Legal System	3
BA169IU	Management Information System	3
EE072IU	Computer and Communication Network	3
IT094IU	Information System Management	4
IT063IU	Theoretical Models in Computing	4

(**) List of AC Elective Courses

You have to take at least 5 courses (16 credits) from following list:

EE061IU	Analog Electronics	3
EE062IU	Analog Electronics Laboratory	1
EEAC011IU	Automation Manufacturing System and Technique	3
EEAC012IU	Automation Manufacturing System and Technique Lab	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	2
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 EEAC001IU	Power Electronics Power Electronics Laboratory	3 1
EE127IU	Machine Learning and Artificial Intelligence	3
EE133IU	Emerging Engineering Technologies	

9.6 Distribution of CEA curriculum_batch 2021

- **Academic English (AE1)**

Freshman Year (1st year)					
Semester 1			*Semester 2*		
MA001IU	Calculus 1	4	MA003IU	Calculus 2	4
PH013IU	Physics 1 (Mechanics)	2	PE008IU	Critical Thinking	3
PE015IU	Philosophy of Marxism and Leninism	3	PH014IU	Physics 2 (Thermodynamics)	2
EN007IU	Writing AE1	2	PE017IU	Scientific socialism	2
EN008IU	Listening AE1	2	EN011IU	Writing AE 2	2
PE016IU	Political economics of Marxism and Leninism	2	EN012IU	Speaking AE2	2
PT001IU	Physical Training 1	0	MA027IU	Applied Linear Algebra	2
EE050IU	Intro to Computer for Engineers	3	EE049IU	Intro to EE	3
			PT002IU	Physical Training 2	0
	Total Credits	18		*Total Credits*	20
Summer Semester					
PE018IU	History of Vietnamese Communist Party	2			
	Total Credits	2			
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
EE051IU	Principles of EE 1	3	PH012IU	Physics 4 (Optics & Atomics)	2
EE052IU	Principles of EE 1 Lab	1	EE010IU	Electromagnetic Theory	3
EE053IU	Digital Logic Design	3	EE055IU	Principles of EE 2	3
EE054IU	Digital Logic Design Lab	1	EE056IU	Principles of EE 2 Lab	1
EE057IU	Programming for Engineers	3	EE090IU	Electronics Devices	3
EE058IU	Programming for Engineers Lab	1	EE091IU	Electronics Devices Lab	1
	Total Credits	19		*Total Credits*	20
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
	General Elective	3	EEAC008IU	Sensors and Instrumentation	3
PE020IU	Engineering Ethics and Professional Skills	3	EE131IU	Capstone Design 2	2
PE019IU	Ho Chi Minh's Thoughts	2	EEAC--IU	AC Elective Course	4
	Total Credits	22		*Total Credits*	21
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC___IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			

EE114IU	Entrepreneurship	3		
	Total Credits	17	*Total Credits*	10

Total: 152 credits

➢ Intensive English 2 (IE2)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
EN074IU	Reading & Writing IE2	0	MA001IU	Calculus 1	4
EN075IU	Listening & Speaking IE2		EN007IU	Writing AE1	2
			EN008IU	Listening AE1	2
			PE015IU	Philosophy of Marxism and Leninism	3
			PE016IU	Political economics of Marxism and Leninism	2
			PH013IU	Physics 1 (Mechanics)	2
			EE049IU	Introduction to EE	3
			PE008IU	Critical Thinking	3
			PT001IU	Physical Training 1	0
	Total Credits	0		*Total Credits*	21
Summer semester					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
PE017IU	Scientific socialism	2	EN012IU	Speaking AE2	2
MA003IU	Calculus 2	4			
				Total Credits	12
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	PH012IU	Physics 4 (Optics & Atomics)	2
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Lab	1
EE054IU	Digital Logic Design Lab	1	EE090IU	Electronics Devices	3
PT002IU	Physical Training 2	0	EE091IU	Electronics Devices Lab	1
MA027IU	Applied Linear Algebra	2	EE057IU	Programming for Engineers	3
			EE058IU	Programming for Engineers Lab	1
	Total Credits	20		*Total Credits*	24
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
PE018IU	History of Vietnamese Communist Party	2	PE019IU	Ho Chi Minh's Thoughts	2
PE020IU	Engineering Ethics and Professional Skills	3	EE131IU	Capstone Design 2	2
				General Elective	3
	Total Credits	19		*Total Credits*	19
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		

EE107IU	Senior Project	2	EE097IU	Thesis	10
EEAC008IU	Sensors and Instrumentation	3	EEAC--IU	AC Elective Course 04	3
EEAC--IU	AC Elective Course	4	EEAC--IU	AC Elective Course 05	3
EEAC--IU	AC Elective Course	3			
EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
	Total Credits	18		*Total Credits*	16

Total: 152 credits

➢ Intensive English 1 (IE1)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
EN072IU	Reading & Writing IE1	0	EN007IU	Writing AE1	2
EN073IU	Listening & Speaking IE1		EN008IU	Listening AE1	2
EN074IU	Reading & Writing IE2	0	MA001IU	Calculus 1	4
EN075IU	Listening & Speaking IE2		PE015IU	Philosophy of Marxism and Leninism	3
			PE016IU	Political economics of Marxism and Leninism	2
			PH013IU	Physics 1 (Mechanics)	2
			EE049IU	Introduction to EE	3
			PT001IU	Physical Training 1	0
			PE008IU	Critical Thinking	3
	Total Credits	0		*Total Credits*	21
Summer semester					
PH014IU	Physics 2 (Thermodynamics)	2	EN011IU	Writing AE 2	2
PE017IU	Scientific socialism	2	EN012IU	Speaking AE2	2
			MA003IU	Calculus 2	4
				Total Credits	12
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	PH012IU	Physics 4 (Optics & Atomics)	2
EE051IU	Principles of EE 1	3	EE010IU	Electromagnetic Theory	3
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
EE053IU	Digital Logic Design	3	EE056IU	Principles of EE 2 Lab	1
EE054IU	Digital Logic Design Lab	1	EE090IU	Electronics Devices	3
PT002IU	Physical Training 2	0	EE091IU	Electronics Devices Lab	1
MA027IU	Applied Linear Algebra	2	EE057IU	Programming for Engineers	3
			EE058IU	Programming for Engineers Lab	1
	Total Credits	20		*Total Credits*	24
Summer semester					
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	EEAC004IU	PC Based Control and SCADA System	3
EE084IU	Micro-processing Systems Lab	1	EEAC005IU	PC Based Control and SCADA System Lab	1
EEAC020IU	Theory of Automatic Control	4	EEAC006IU	Programmable Logic Control	3
EE130IU	Capstone Design 1	2	EEAC007IU	Programmable Logic Control Lab	1
PE018IU	History of Vietnamese Communist Party	2	PE019IU	Ho Chi Minh's Thoughts	2

PE020IU	Engineering Ethics and Professional Skills	3	EE131IU	Capstone Design 2	2
EE130IU	Capstone Design 1	2		General Elective	3
PE020IU	Engineering Ethics and Professional Skills	3			
	Total Credits	19		*Total Credits*	19
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE107IU	Senior Project	2	EEAC--IU	AC Elective Course	3
EEAC--IU	AC Elective Course	4	EEAC--IU	AC Elective Course	3
EEAC--IU	AC Elective Course	3	EE097IU	Thesis	10
EEAC--IU	AC Elective Course	3			
EE114IU	Entrepreneurship	3			
EEAC008IU	Sensors and Instrumentation	3			
	Total Credits	18		*Total Credits*	16

Total: 152 credits

➢ Intensive English 0 (IE0)

Freshman Year (1st year)					
Semester 1			*Semester 2*		
	Reading & Writing IE0	0		Reading & Writing IE2	0
	Listening & Speaking IE0			Listening & Speaking IE2	
	Reading & Writing IE1	0			
	Listening & Speaking IE1				
	Total Credits	0		*Total Credits*	0
Summer semester					
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
PE015IU	Philosophy of Marxism and Leninism	3	EE049IU	Introduction to EE	3
MA027IU	Applied Linear Algebra	2	EE053IU	Digital Logic Design	3
PT001IU	Physical Training 1	0	EE054IU	Digital Logic Design Lab	1
EN011IU	Writing AE 2	2	PH012IU	Physics 4 (Optics & Atomics)	2
EN012IU	Speaking AE2	2	PE016IU	Political economics of Marxism and Leninism	2
EE050IU	Intro to Computer for Engineers	3	PH014IU	Physics 2 (Thermodynamics)	2
EE051IU	Principles of EE 1	3	EEAC021IU	Mathematics for Engineers	4
EE052IU	Principles of EE 1 Lab	1	EE055IU	Principles of EE 2	3
			EE056IU	Principles of EE 2 Lab	1
	Total Credits	20		*Total Credits*	21
Summer semester					
Junior Year (3rd year)					
Semester 1			*Semester 2*		
EEAC001IU	Materials Science & Engineering	3	EE088IU	Signals & Systems	3
EE057IU	Programming for Engineers	3	EE089IU	Signals & Systems Lab	1
EE058IU	Programming for Engineers Lab	1	EEAC004IU	PC Based Control and SCADA System	3

EE010IU	Electromagnetic Theory	3	EEAC005IU	PC Based Control and SCADA System Lab	1
EE090IU	Electronics Devices	3	EEAC006IU	Programmable Logic Control	3
EE091IU	Electronics Devices Lab	1	EEAC007IU	Programmable Logic Control Lab	1
MA026IU	Probability& Random Process	3	EEAC020IU	Theory of Automatic Control	4
MA024IU	Differential Equations	4	EE131IU	Capstone Design 1	2
PE017IU	Scientific socialism	2	EE083IU	Micro-processing Systems	3
			EE084IU	Micro-processing Systems Lab	1
	Total Credits	23		*Total Credits*	22
Summer Semester					
PE018IU	History of Vietnamese Communist Party	2	PE019IU	Ho Chi Minh's Thoughts	2
				Total Credits	4
Senior Year (4th year)					
Semester 1			*Semester 2*		
EE092IU	Digital Signal Processing	3	EEAC--IU	AC Elective Course	3
EE093IU	Digital Signal Processing Lab	1	EEAC--IU	AC Elective Course	3
EEAC--IU	AC Elective Course	4	EEAC--IU	AC Elective Course	3
EEAC--IU	AC Elective Course	3		General Elective	3
EEAC008IU	Sensors and Instrumentation	3	EE107IU	Senior Project	2
PE020IU	Engineering Ethics and Professional Skills	3	EE114IU	Entrepreneurship	3
PE008IU	Critical Thinking	3			
EE131IU	Capstone Design 2	2			
	Total Credits	22		*Total Credits*	17
Summer Semester					
EE112IU	Summer Internship	3			
Senior Year (5th year)					
Semester 1			*Semester 2*		
EE097IU	Thesis	10			
	Total Credits	10			

Total: 152 credits

List of General Elective Courses

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
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
EE072IU	Computer and Communication Network	3

(**) List of AC Elective Courses

You have to take at least 5 courses (16 credits) from following list:

EE061IU	Analog Electronics	3
EE062IU	Analog Electronics Laboratory	1
EEAC011IU	Automation Manufacturing System and Technique	3
EEAC012IU	Automation Manufacturing System and Technique Lab	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	2
EEAC010IU	Electric Machine	3
EE104IU	Embedded Real-time Systems	3
EE118IU	Embedded Real-time Systems Laboratory	1
EE102IU	Stochastic Signal Processing	3
EE103IU	Image Processing and Computer Vision	3
EE122IU	Image Processing and Computer Vision Laboratory	1
EEAC018IU	Advanced Control Engineering	3
EEAC019IU	System Diagnostic	3
EE068IU	Principles of Communication	3
EE115IU	Principles of Communication Laboratory	1
EE079IU	Power Electronics	3
EEAC001IU	Power Electronics Laboratory	1
EE127IU	Machine Learning and Artificial Intelligence	3

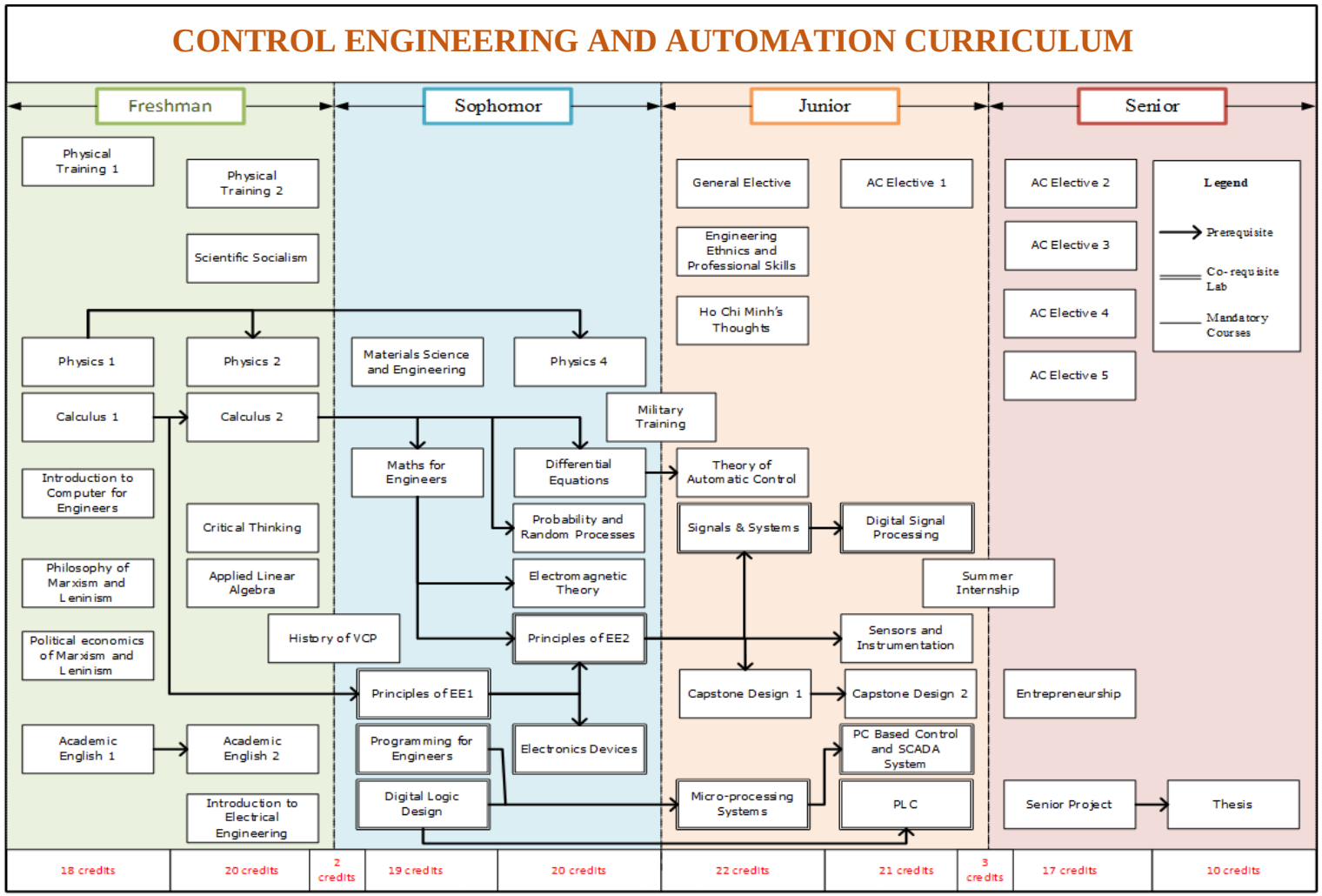
EE133IU	Emerging Engineering Technologies	3

9.7 List of prerequisite courses

No.	Course	Prerequisite course
1	Calculus 2 (MA003IU)	Calculus 1 (MA001IU)
2	Mathematics for Engineers (EEAC002IU)	Calculus 2 (MA003IU)
3	Differential Equations (MA024IU)	Calculus 2 (MA003IU)
4	Academic English 2 (EN011IU & EN012IU)	Academic English 1 (EN007IU & EN008IU)
5	Principles of EE1 (EE051IU)	Calculus 1 (MA001IU)
6	Principles of EE2 (EE055IU)	Principles of EE1 (EE051IU) Mathematics for Engineers (EEAC002IU)
7	Electromagnetic Theory (EE010IU)	Calculus 2 (MA003IU)
8	Electronic Devices (EE090IU)	Principles of EE1 (EE051IU)
9	Signals & Systems (EE088IU)	Principles of EE2 (EE055IU)
10	Microprocessor Systems (EE083IU)	Digital Logic Design (EE053IU) Programming for Engineers (C) (EE057IU)
11	Theory of Automatic Control (EE075IU or EEAC020IU)	Differential Equations (MA024IU)
12	Digital Signal Processing (EE092IU)	Signals & Systems (EE088IU)
13	Power Electronics (EE079IU)	Electronic Devices (EE090IU)
14	PC Based Control and SCADA System (EEAC004IU)	Microprocessor Systems (EE083IU)
15	Programmable Logic Control (PLC) (EEAC006IU)	Digital Logic Design (EE053IU)
16	Sensors and Instrumentation (EEAC008IU)	Principles of EE2 (EE055IU)
18	Embedded Real-time Systems (EE104IU)	Microprocessor Systems (EE083IU
19	Analog Electronics (EE061IU)	Electronic Devices (EE090IU)
20	Principles of Communication Systems (EE068IU)	Signals & Systems (EE088IU)
21	Stochastic Signal Processing (EE102IU)	Digital Signal Processing (EE092IU)
22	Image Processing (EE103IU)	Signals & Systems (EE088IU)
23	Neural Networks and fuzzy controls (EEAC014IU)	Theory of Automatic Control (EE075IU or EEAC020IU)
24	Robotics (EEAC015IU)	Theory of Automatic Control (EE075IU or EEAC020IU)
25	Digital Control (EEAC017IU)	Theory of Automatic Control (EE075IU or EEAC020IU)
26	Electric Machine (EEAC010IU)	Principles of EE2 (EE055IU)
27	Advanced Control Engineering (EEAC018IU)	Theory of Automatic Control (EE075IU or EEAC020IU)

10. CURRICULUM MAPPING

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



11. RELATION OF PROGRAM ELOS AND COURSES

Course ID	Course Name	ECTS	Credits	Sem	Intended Learning Outcomes						
					1	2	3	4	5	6	7
Freshman Year (1st year)											
MA001IU	Calculus 1	6.8	4	1	x						
PH013IU	Physics 1	3.4	2	1	x	x					
MA003IU	Calculus 2	6.8	4	2	x						
PH014IU	Physics 2	3.4	2	2	x	x					
MA027IU	Applied Linear Algebra	3.4	2	2	x						
EE049IU	Introduction to EE	5.1	3	2		x	x	x			x
EE050IU	Intro to Computer for Engineers	5.1	3	1	x	x		x			
PE008IU	Critical Thinking	5.1	3	2			x	x			
PE016IU	Political economics of Marxism and Leninism	3.4	2	1				x			
PE015IU	Philosophy of Marxism and Leninism	5.1	3	1				x			
PE017IU	Scientific socialism	3.4	2	2				x			
PT001IU	Physical Training 1		0								
EN007IU	Writing AE1	3.4	2	1			x				
EN011IU	Writing AE2	3.4	2	2			x				
PT001IU	Listening AE1	3.4	2	1			x				
EN012IU	Speaking AE2	3.4	2	2			x				
PT002IU	Physical Training 2		0								
PE018IU	History of Vietnamese Communist Party	3.4	2	Summer			x				
Sophomore year (2nd year)											
EEAC001IU	Materials Science & Engineering	5.1	3	1	x	x		x		x	

EEAC021IU	Mathematics for Engineers	6.8	4	1	x	x				x	
EE051IU	Principles of EE 1	5.1	3	1	x	x	x	x	x		
EE052IU	Principles of EE 1 Lab	1.7	1	1	x		x	x	x		
EE053IU	Digital Logic Design	5.1	3	1	x	x					
EE054IU	Digital Logic Design Lab	1.7	1	1	x	x	x		x		
EE057IU	Programming for Engineers	5.1	3	1	x	x		x			x
EE058IU	Programming for Engineers Lab	1.7	1	1	x			x			x
MA026IU	Probability & Random Process	5.1	3	2	x						
MA024IU	Differential Equations	6.8	4	2	x						
PH012IU	Physics 4 (Optics & Atomics)	3.4	2	2	x	x					
EE010IU	Electromagnetic Theory	5.1	3	2	x	x		x			
EE055IU	Principles of EE 2	5.1	3	2	x	x		x			
EE056IU	Principles of EE 2 Lab	1.7	1	2	x	x		x			
EE090IU	Electronics Devices	5.7	3	2	x	x		x			
EE091IU	Electronics Devices Lab	1.7	1	2	x			x	x	x	
Junior Year (3rd year)											
EE088IU	Signals & Systems	5.7	3	1	x						
EE089IU	Signals & Systems Lab	1.7	1	1		x		x		x	
EE083IU	Micro-processing Systems	5.1	3	1	x	x				x	
EE084IU	Micro-processing Systems Lab	1.7	1	1	x					x	x
EEAC020IU	Theory of Automatic Control	6.8	4	1	x						
EE130IU	Capstone Design 1	3.4	2	1	x	x		x	x		
	General Elective	5.1	3	1							
PE019IU	Ho Chi Minh's Thoughts	3.4	2	1				x			
PE020IU	Engineering Ethics and Professional Skills	5.1	3	1		x	x	x	x		x
EE092IU	Digital Signal Processing	5.1	3	2	x	x		x		x	

EE093IU	Digital Signal Processing Lab	1.7	1	2	x		x		x		
EEAC004IU	PC Based Control and SCADA System	5.1	3	2	x	x					
EEAC005IU	PC Based Control and SCADA System Lab	1.7	1	2	x		x				
EEAC006IU	Programmable Logic Control	5.1	3	2	x	x					
EEAC007IU	Programmable Logic Control Lab	1.7	1	2	x		x				
EEAC008IU	Sensors and Instrumentation	5.1	3	2	x					x	
EE131IU	Capstone Design 2	3.4	2	2		x	x	x	x		
EEAC--IU	AC Elective Course 01	6.8	4	2							
EE112IU	Summer Internship	5.1	3	3	x		x		x	x	x
Senior Year (4th year)											
EE107IU	Senior Project	3.4	2	1	x	x	x	x			x
EEAC--IU	AC Elective Course (4 courses)	5.1	3	1							
EE114IU	Entrepreneurship	5.1	3	1		x		x	x		
EE097IU	Thesis	17	10	2	x	x	x	x			x