

Computer Engineering (CPE)

Curriculum Outline

The computer engineering curriculum is designed to prepare students for new trends in hardware and software development, as well as frontiers in computing technology. Students are exposed to a wide range of subjects covering all aspects of computer engineering and their applications.

The compulsory core courses help students to:

- (1) Gain fundamental concepts related to computers and information technology that lead to high performance digital processing,
- (2) Know the essence of hardware and software systems that leads to the effective and efficient development of computer systems, and
- (3) Understand applications of fundamental knowledge in frontier multi-disciplinary fields.

After gaining enough background through the compulsory core courses, the students are allowed to tailor their courses according to their personal interest. Twelve credits of elective courses, which are required for graduation, can be selected from one of these:

- (1) Artificial Intelligence,
- (2) Cloud Computing and Cyber Security, or
- (3) General Computer Engineering

Structure and Components

1. General Basic Courses	30 Credits
1.1 Part I	21 Credits
1.1.1 Social Sciences	6 Credits
1.1.2 Humanities	3 Credits
1.1.3 Science and Mathematics	3 Credits
1.1.4 Languages	9 Credits
1.2 Part II	9 Credits
2. Major Courses	114 Credits
2.1 Core Courses	40 Credits
2.2 Specialized Courses	53 Credits
2.3 Elective Courses	15 Credits
2.4 Field-Experience Courses	6 Credits
3. Free Elective Courses	6 Credits
Total	150 Credits

Details of the Curriculum

1. General Basic Courses	30 Credits
1.1 Part I	21 Credits
1.1.1 Social Sciences (2 courses) TU100 TU101	6 Credits
1.1.2 Humanities (1 course) TU102	3 Credits
1.1.3 Science and Mathematics (1 course) TU103	3 Credits
1.1.4 Languages (3 courses) TU104 TU105 TU106	9 Credits
1.2 Part II	9 Credits
GTS133 GTS202 ITS100	
2. Major Courses	114 Credits
2.1 Core Courses	40 Credits
2.1.1 Core Engineering Courses CSS322 CSS331 CSS400 EES203 EES204 GTS116 GTS117 GTS121 GTS122 GTS210 GTS231 GTS302 IES302 MTS252 MTS258	
2.2 Specialized Courses	53 Credits
2.2.1 Technologies for Applications CSS325 CSS326 ITS229	7 Credits
2.2.2 Technologies and Software Processes CSS323 ITS102 ITS103 ITS221 ITS227 ITS231 ITS329	17 Credits
2.2.3 System Infrastructure CSS221 CSS225 CSS321 CSS324 CSS334 ITS201 ITS352	19 Credits
2.2.4 Hardware and Computer Architecture CSS224 CSS332 EES370 EES371	10 Credits
2.3 Elective Courses	15 Credits
2.3.1 Select one of the following options	
2.3.1.1 Option I: Artificial Intelligence CSS431 CSS432 CSS433 CSS434	12 Credits
2.3.1.2 Option II: Cloud Computing and Cyber Security CSS451 CSS452 CSS453 CSS454	12 Credits
2.3.1.3 Option III: General Computer Engineering Select 4 courses from the following courses: CSS431 CSS432 CSS433 CSS434 CSS451 CSS452 CSS453 CSS454 CSS481 CSS482 CSS483 CSS484 CSS485 CSS486	
2.3.2 Technical Elective Course	3 Credits
Select 3 credits from the list of courses offered by SIIT, except for basic courses. XXSxxx	
2.4 Field-Experience Courses	6 Credits
Select one of the following tracks	
2.4.1 Senior Project Track CSS300 CSS403	
2.4.2 Foreign Exchange Track CSS300 CSS495 CSS497	
2.4.3 Extended Training Track CSS499	
3. Free Elective Courses	6 Credits
Students may choose any free elective courses (not less than 6 credits in total) offered by SIIT or TU, including general basic courses, except:	
1. General basic courses in Science and Mathematics.	
2. General basic TU courses.	
3. Courses with contents similar to those of other courses in the curriculum already taken by the students.	

Total Credit Requirement

150 Credits

CPE Curriculum : 150 Credits

First Year

Semester I

TU102	Social Life Skills	3(3-0-6)
TU104	Critical Thinking, Reading, and Writing	3(3-0-6)
GTS116	Mathematics for Technologists I	3(3-0-6)
GTS133	Environmental Studies	3(3-0-6)
GTS121	General Science I	3(3-0-6)
ITS100	Introduction to Computers and Programming	3(2-3-4)
MTS252	Materials Science	3(3-0-6)
Sub-Total		21(20-3-40)

Semester II

TU100	Civic Engagement	3(3-0-6)
TU103	Life and Sustainability	3(3-0-6)
TU105	Communication Skills in English	3(3-0-6)
TU106	Creativity and Communication	3(3-0-6)
GTS117	Mathematics for Technologists II	3(3-0-6)
GTS122	General Science II	3(3-0-6)
ITS102	Object-Oriented Programming	3(3-0-6)
ITS103	Object-Oriented Programming Laboratory	1(0-3-0)
Sub-Total		22(21-3-42)

Second Year

Semester I

CSS224	Computer Architectures	3(3-0-6)
EES371	Digital Circuits	3(3-0-6)
GTS210	Mathematics for Technologists III	3(3-0-6)
GTS231	Law and Technology	3(3-0-6)
ITS201	Discrete Mathematics	3(3-0-6)
ITS221	Data Structures and Algorithms	3(3-0-6)
ITS231	Data Structures and Algorithms Laboratory	1(0-3-0)
Sub-Total		19(18-3-36)

Semester II

CSS221	Computer Graphics and Applications	3(2-3-4)
CSS225	Operating System	3(3-0-6)
EES203	Basic Electrical Engineering	3(3-0-6)
EES370	Digital Circuit Laboratory	1(0-3-0)
IES302	Engineering Statistics	3(3-0-6)
ITS227	Algorithm Design	3(3-0-6)
ITS229	Human Computer Interface Design	3(3-0-6)
Sub-Total		19(17-6-34)

Third Year

Semester I

CSS321	Theory of Computation	3(3-0-6)
CSS322	Scientific Computing	3(3-0-6)
CSS331	Fundamentals of Data Communications	3(3-0-6)
CSS324	Artificial Intelligence	3(3-0-6)
CSS325	Database Systems	3(3-0-6)
CSS326	Database Programming Laboratory	1(0-3-0)
EES204	Basic Electrical Engineering Laboratory	1(0-3-0)
GTS202	English Language Structures	3(3-0-6)
Sub-Total		20(18-6-36)

Semester II

CSS332	Microcontrollers and Applications	3(2-3-4)
CSS323	Software Engineering	3(3-0-6)
CSS334	Computer Networks and Internetworking	3(3-0-6)
GTS302	Technical Writing	2(2-1-3)
ITS329	System Analysis and Design	3(3-0-6)
ITS352	Networking Laboratory	1(0-3-0)

Option I: Artificial Intelligence

CSS431	Machine Learning and Pattern Recognition	3(3-0-6)
CSS432	Natural Language Processing and Information Retrieval	3(3-0-6)
Sub-Total		21(19-7-37)

Option II: Cloud Computing and Cyber Security

CSS451	Cloud Computing	3(3-0-6)
CSS452	Internet of Things	3(3-0-6)
Sub-Total		21(19-7-37)

Option III: General Computer Engineering

CSSxxx	Compulsory Elective	3(x-x-x)
CSSxxx	Compulsory Elective	3(x-x-x)
Sub-Total		21(x-x-x)

Summer

1) Senior Project Track and Foreign Exchange Track

CSS300	Computer Engineering Training	1(0-40-0)
Sub-Total		1(0-40-0)

2) Extended Training Track

XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
Sub-Total		6(x-x-x)

Fourth Year

Semester I

MTS258	Economics for Technologists	3(3-0-6)
CSS400	Project Development	1(0-3-0)
TU101	Thailand, ASEAN, and the World	3(3-0-6)
XXSxxx	Technical Elective	3(x-x-x)

Option I: Artificial Intelligence

CSS433	Computer Vision	3(3-0-6)
CSS434	Knowledge Representation and Reasoning	3(3-0-6)
Sub-Total		16(x-x-x)

Option II: Cloud Computing and Cyber Security

CSS453	Cyber Crimes and Digital Forensics	3(3-0-6)
CSS454	Network Security	3(3-0-6)
Sub-Total		16(x-x-x)

Option III: General Computer Engineering

CSSxxx	Compulsory Elective	3(x-x-x)
CSSxxx	Compulsory Elective	3(x-x-x)
Sub-Total		16(x-x-x)

Semester II

1) Senior Project Track

CSS403	Computer Engineering Project	5(0-15-0)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
Sub-Total		11(x-x-x)

2) Foreign Exchange Track

CSS495	Special Studies in Computer Engineering I	3(3-0-6)
CSS497	Special Studies in Computer Engineering III	2(2-0-4)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
Sub-Total		11(x-x-x)

3) Extended Training Track

CSS499	Extended Computer Engineering Training	6(0-40-0)
Sub-Total		6(0-40-0)