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 will be exposed to a wide range of subjects covering all aspects of computer engineering and their applications. Emphasis is put on foundations of intelligent system development and techniques related to pervasive technology.

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 to 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 compulsory elective courses, which are required for graduation, can be selected from one of these:

(1) Major in Intelligent Systems,
(2) Major in Pervasive Technology, or
(3) Major in General Computer Engineering (CPE)

Structure and Components

1.	**General Basic Courses**		**36**	**Credits**
1.1	Part I		21	Credits
	1.1.1	Humanities	2	Credits
	1.1.2	Social Sciences	5	Credits
	1.1.3	Languages	9	Credits
	1.1.4	Science and Mathematics	5	Credits
1.2	Part II		15	Credits
2.	**Core Courses**		**108**	**Credits**
2.1	Compulsory Courses		93	Credits
2.2	Compulsory Elective Courses		12	Credits
2.3	Technical Elective Courses		3	Credits
3.	**Free Elective Courses**		**6**	**Credits**
	Total		**150**	**Credits**

Details of the Curriculum

1. General Basic Courses 36 Credits

1.1 Part I 21 Credits

1.1.1 Humanities (1 course) 2 Credits
TU110

1.1.2 Social Sciences (2 courses) 5 Credits
TU120 TU100

1.1.3 Languages (3 courses) 9 Credits
EL171 EL172 TU140

1.1.4 Science and Mathematics (2 courses) 5 Credits
ITS100 TU130

1.2 Part II 15 Credits
EC210 GTS101 GTS133
GTS202 GTS231

2. Core Courses 108 Credits

2.1 Compulsory Courses 93 Credits

2.1.1 Science and Mathematics (5 courses) 15 Credits
GTS116 GTS117 GTS210
SCS138 SCS139

2.1.2 Non CPE Courses (19 courses) 44 Credits
ECS203 ECS204 ECS370 ECS371
GTS302 IES302 ITS102 ITS103
ITS201 ITS221 ITS227 ITS229
ITS231 ITS322 ITS329 ITS336
ITS351 ITS352 MTS252

2.1.3 CPE Courses (11-13 courses) 34 Credits
CSS221 CSS224 CSS225 CSS226
CSS321 CSS331 CSS332 CSS333
CSS334 CSS400

- **For Students who wish to join the Senior Project Track (6 Credits)**
  CSS300 CSS403
- **For Students who wish to join the Foreign Exchange Track (6 Credits)**
  CSS300 CSS495 CSS496
- **For Students who wish to join the Extended Training Track (6 Credits)**
  CSS499

2.2 Compulsory Elective Courses 12 Credits

2.2.1 Option I: Intelligent Systems (4 courses)
CSS431 CSS432 CSS433 CSS434

2.2.2 Option II: Pervasive Technology (4 courses)
CSS441 CSS442 CSS443 CSS444

2.2.3 Option III: General Computer Engineering (CPE)
Select 4 courses (12 credits) from the following courses:
CSS431 CSS432 CSS433 CSS434
CSS441 CSS442 CSS443 CSS444
ITS481 ITS482 ITS483 ITS484
ITS485 ITS486 ITS487 ITS488
ITS489

2.3 Technical Elective Courses 3 Credits
Select 3 credits from the list of courses offered by SIIT, except for basic courses.
XXSxxx

3. Free Elective Courses 6 Credits

Students may choose any free elective courses (not less than 6 credits in total) including general basic courses, except:
1. General basic courses in Science and Mathematics
2. All general basic TU courses in both Part 1 and Part 2

Total Credit Requirement 150 Credits

CPE Curriculum : 150 Credits

Course		Credits (lecture-practice-self study hrs)
First Year		
Semester I		
EL171	English Course II	3(3-0-6)
GTS101	Skills Development for Technical Studies	3(3-0-6)
GTS116	Mathematics for Technologists I	3(3-0-6)
GTS133	Environmental Studies	3(2-2-5)
ITS100	Introduction to Computers and Programming	3(2-3-4)
MTS252	Materials Science	3(3-0-6)
SCS138	Applied Physics I	3(3-0-6)
	Sub-Total	**21(19-5-39)**
Semester II		
EC210	Introductory Economics	3(3-0-6)
EL172	English Course III	3(3-0-6)
GTS117	Mathematics for Technologists II	3(3-0-6)
ITS102	Object-Oriented Programming	3(3-0-6)
ITS103	Object-Oriented Programming Laboratory	1(0-3-0)
SCS139	Applied Physics II	3(3-0-6)
TU100	Civic Education	3(3-0-6)
TU130	Integrated Sciences and Technology	2(2-0-4)
	Sub-Total	**21(20-3-40)**
Second Year		
Semester I		
CSS224	Computer Architectures	3(3-0-6)
ECS371	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)
TU110	Integrated Humanities	2(2-0-4)
	Sub-Total	**21(20-3-40)**
Semester II		
CSS221	Computer Graphics and Applications	3(2-3-4)
CSS225	Operating System	3(3-0-6)
ECS203	Basic Electrical Engineering	3(3-0-6)
ECS370	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		
CSS226	Scientific Computing	3(3-0-6)
CSS321	Theory of Computation	3(3-0-6)
CSS331	Fundamentals of Data Communications	3(3-0-6)
ECS204	Basic Electrical Engineering Laboratory	1(0-3-0)
GTS202	English Language Structures	3(3-0-6)
ITS322	Database Systems	3(3-0-6)
ITS336	Artificial Intelligence	3(3-0-6)
ITS351	Database Programming Laboratory	1(0-3-0)
	Sub-Total	**20(18-6-36)**
Semester II		
CSS332	Microcontrollers and Applications	3(2-3-4)
CSS333	Parallel and Distributed Computing	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)

Course		Credits (lecture-practice-self study hrs)
	Option I: Intelligent Systems	
CSS431	Machine Learning and Pattern Recognition	3(3-0-6)
CSS432	Information Retrieval	3(3-0-6)
	Sub-Total	**21(19-7-37)**
	Option II: Pervasive Technology	
CSS441	Security and Cryptography	3(3-0-6)
CSS442	Computer Interfacing	3(3-0-6)
	Sub-Total	**21(19-7-37)**
	Option III: General Computer Engineering (CPE)	
CSSxxx	Compulsory Elective	3(x-x-x)
CSSxxx	Compulsory Elective	3(x-x-x)
	Sub-Total	**21(x-x-x)**
Summer		
Select either Senior Project Track, Foreign Exchange Track, or Extended Training Track.		
1) Senior Project Track and Foreign Exchange Track		
CSS300	Computer Engineering Training	0(0-0-0)
	Sub-Total	**0(0-0-0)**
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		
CSS400	Project Development	1(0-3-0)
TU120	Integrated Social Sciences	2(2-0-4)
TU140	Thai Studies	3(3-0-6)
XXSxxx	Technical Elective	3(x-x-x)
	Option I: Intelligent Systems	
CSS433	Computer Vision	3(3-0-6)
CSS434	Knowledge Representation and Reasoning	3(3-0-6)
	Sub-Total	**15(x-x-x)**
	Option II: Pervasive Technology	
CSS443	Real-time and Embedded Systems	3(3-0-6)
CSS444	Wireless Networks	3(3-0-6)
	Sub-Total	**15(x-x-x)**
	Option III: General Computer Engineering (CPE)	
CSSxxx	Compulsory Elective	3(x-x-x)
CSSxxx	Compulsory Elective	3(x-x-x)
	Sub-Total	**15(x-x-x)**
Semester II		
1) Senior Project Track		
CSS403	Computer Engineering Project	6(0-18-0)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
	Sub-Total	**12(x-x-x)**
2) Foreign Exchange Track		
CSS495	Special Studies in Computer Engineering I	3(3-0-6)
CSS496	Special Studies in Computer Engineering II	3(3-0-6)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
	Sub-Total	**12(x-x-x)**
3) Extended Training Track		
CSS499	Extended Computer Engineering Training	6(0-40-0)
	Sub-Total	**6(0-40-0)**