

## Computer Science (CS)

### Curriculum Outline

The Computer Science curriculum is designed to prepare students for new trends in software development and frontier informatics. Students will be exposed to a wide range of subjects covering most aspects of Computer Science and its applications. Emphasis is put on large-scale software development methodology and computer applications in multi-disciplinary fields, such as bioinformatics, multimedia processing, and knowledge management.

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 software development methodology that leads to the effective and efficient development of large-scaled software, and
- (3) understand application 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 General CS
- (2) Major in Software Engineering
- (3) Major in Informatics

### Structure and Components

1. General Basic Courses	<b>36 Credits</b>
1.1 Humanities	6 Credits
1.2 Social Sciences	9 Credits
1.3 English Language	9 Credits
1.4 Science and Mathematics	12 Credits
2. Core Courses	<b>108 Credits</b>
2.1 Compulsory Courses	93 Credits
2.2 Compulsory Elective Courses	12 Credits
2.3 Technical Elective Courses	3 Credits
3. Free Elective Courses	<b>6 Credits</b>
<b>Total</b>	<b><u>150</u> Credits</b>

### Details of the Curriculum

1. General Basic Courses	<b>36 Credits</b>
1.1 Humanities (2 courses) TU 110 TU 140	6 Credits
1.2 Social Sciences (3 courses) EC 210 GTS 231 TU 120	9 Credits
1.3 English Language (3 courses) EL 171 EL 172 EL 210	9 Credits
1.4 Science and Mathematics (4 courses) GTS 132 GTS 133 ITS 050 TU 130	12 Credits
2. Core Courses	<b>108 Credits</b>
2.1 Compulsory Courses	93 Credits
2.1.1 Science and Mathematics (6 courses)	18 Credits
GTS 121 GTS 122 GTS 211 MAS 116 MAS 117 MAS 210	
2.1.2 Non-CS Courses (21 courses)	50 Credits
ECS 370 ECS 371 ECS 382 GTS 302 IES 302 ITS 033 ITS 221 ITS 223 ITS 225 ITS 226 ITS 321 ITS 322 ITS 323 ITS 325 ITS 327 ITS 329 ITS 331 ITS 332 ITS 333 ITS 451 MTS 252	
2.1.3 CS Courses (8-10 courses)	25 Credits
CSS 221 CSS 222 CSS 223 CSS 321 CSS 322 CSS 323 CSS 400 (CSS 403 and CSS 300) or (CSS 495 and 496 and CSS 300) or (CSS 499)	
2.2 Compulsory Elective Courses	12 Credits
2.2.1 <i>Option I: General CS</i> Select 4 courses (12 credits) from the following courses:	
CSS 411 CSS 412 CSS 413 CSS 414 CSS 421 CSS 422 CSS 423 CSS 424 ITS 481 ITS 482 ITS 483 ITS 484 ITS 485 ITS 486 ITS 487 ITS 488 ITS 489	
2.2.2 <i>Option II: Software Engineering</i> (4 courses)	4 Credits
CSS 411 CSS 412 CSS 413 CSS 414	
2.2.3 <i>Option III: Informatics</i> (4 courses)	4 Credits
CSS 421 CSS 422 CSS 423 CSS 424	
2.3 Technical Elective Courses	3 Credits
Select 3 credits from the list of courses offered by SIIT, except basic courses. XXS xxx	
3. Free Elective Courses	<b>6 Credits</b>
Select any courses offered by the university, except basic courses. XXX xxx	
<b>Total Credit Requirement</b>	<b><u>150</u> Credits</b>

## CS Curriculum : 150 Credits

### First Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
EC 210	Introductory Economics 3(3-1-5)
EL 171	English Course II 3(3-1-5)
GTS 121	General Science I 3(3-1-5)
ITS 050	Introduction to Computers and Programming 3(2-3-4)
MAS 116	Mathematics I 3(3-1-5)
MTS 252	Materials Science 3(3-0-6)
TU 130	Integrated Sciences and Technology 3(3-0-6)
<b>Sub-Total 21(20-7-36)</b>	

#### *Semester II*

EL 172	English Course III 3(3-1-5)
GTS 122	General Science II 3(3-1-5)
GTS 132	Introduction to Life Science 3(3-1-5)
GTS 133	Environmental Studies 3(2-2-5)
ITS 033	Programming and Algorithms 3(3-0-6)
MAS 117	Mathematics II 3(3-1-5)
<b>Sub-Total 18(17-6-31)</b>	

### Third Year

#### *Semester I*

CSS 321	Theory of Computation 3(3-0-6)
CSS 323	Compiler Design 3(3-0-6)
EL 210	English for Engineers I 3(3-1-5)
GTS 231	Law and Technology 3(3-1-5)
ITS 322	Database Management Systems 3(3-0-6)
ITS 323	Introduction to Data Communications 3(3-0-6)
ITS 331	Information Technology I Laboratory 1(0-3-0)
TU 110	Integrated Humanities 3(3-0-6)
<b>Sub-Total 22(21-5-40)</b>	

#### *Semester II*

CSS 322	Security and Cryptography 3(3-0-6)
GTS 302	Technical Writing 2(2-1-3)
ITS 327	Computer Network Architectures and Protocols 3(3-0-6)
ITS 329	System Analysis and Design 3(3-0-6)
ITS 332	Information Technology II Laboratory 1(0-3-0)
ITS 333	Information Technology III Laboratory 1(0-3-0)
ITS 451	Artificial Intelligence 3(3-0-6)

#### *Option I: General CS*

CSS xxx	Compulsory Elective 3(x-x-x)
CSS xxx	Compulsory Elective 3(x-x-x)
<b>Sub-Total 22(x-x-x)</b>	

#### *Option II: Software Engineering*

CSS 411	Software Process and Quality Assurance 3(3-0-6)
CSS 412	Software Architecture 3(3-0-6)
<b>Sub-Total 22(x-x-x)</b>	

#### *Option III: Informatics*

CSS 421	Pattern Recognition 3(3-0-6)
CSS 422	Knowledge Management and Discovery 3(3-0-6)
<b>Sub-Total 22(x-x-x)</b>	

#### *Summer*

CSS 300	Computer Science Training 0(0-0-0)
(Except students who select to take CSS 499)	

### Second Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
ECS 370	Digital Circuit Laboratory 1(0-3-0)
ECS 371	Digital Circuits 3(3-0-6)
GTS 211	Differential Equations and Numerical Methods 3(3-0-6)
ITS 221	Data Structures and Algorithms 3(3-0-6)
ITS 223	Programming Laboratory I 1(0-3-0)
ITS 321	Discrete Mathematics 3(3-0-6)
ITS 325	Computer Architectures 3(3-0-6)
MAS 210	Mathematics III 3(3-1-5)
<b>Sub-Total 20(18-7-35)</b>	

#### *Semester II*

CSS 221	Computer Graphics and Multimedia 3(2-3-4)
CSS 222	Object-Oriented Programming in JAVA 3(3-0-6)
CSS 223	Principles of Programming Languages 3(3-0-6)
ECS 382	Microprocessors 3(3-0-6)
IES 302	Engineering Statistics 3(3-1-5)
ITS 225	Operating System 3(3-0-6)
ITS 226	Programming Laboratory II 1(0-3-0)
<b>Sub-Total 19(17-7-33)</b>	

### Fourth Year

#### *Semester I*

CSS 400	Project Development 1(0-3-0)
TU 120	Integrated Social Sciences 3(3-0-6)
TU 140	Thai Studies 3(3-0-6)
XXS xxx	Technical Elective 3(x-x-x)

#### *Option I: General CS*

CSS xxx	Compulsory Elective 3(x-x-x)
CSS xxx	Compulsory Elective 3(x-x-x)
<b>Sub-Total 16(x-x-x)</b>	

#### *Option II: Software Engineering*

CSS 413	Software Verification and Validation 3(3-0-6)
CSS 414	Software Project Management 3(3-0-6)
<b>Sub-Total 16(x-x-x)</b>	

#### *Option III: Informatics*

CSS 423	Bioinformatics 3(3-0-6)
CSS 424	Multimedia Processing 3(3-0-6)
<b>Sub-Total 16(x-x-x)</b>	

#### *Semester II*

*XXXxxx	Free Elective 3(x-x-x)
*XXXxxx	Free Elective 3(x-x-x)

and one of the following 3 tracks:

1) Senior Project Track	
CSS 403	Senior Project 6(0-18-0)
<b>Sub-Total 12(x-x-x)</b>	

2) Foreign Exchange Track	
CSS 495	Special Topic in Computer Science I 3(3-0-6)
CSS 496	Special Topic in Computer Science II 3(3-0-6)
<b>Sub-Total 12(x-x-x)</b>	

3) Extended Training Track	
CSS 499	Extended Computer Science Training 6(0-40-0)
<b>Sub-Total 12(x-x-x)</b>	

#### Remark

\*Students who plan to choose the extended training track in the second semester of their 4<sup>th</sup> year are advised to take 6 credits of these Free Elective courses in the summer session of the 3<sup>rd</sup> year and take CSS 499 in the fourth year.