

## 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 all aspects of Computer Science and its applications. Emphasis is put on large-scaled 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	36 Credits
1.1 Part I	21 Credits
1.1.1 Humanities	3 Credits
1.1.2 Social Sciences	3 Credits
1.1.3 Languages	9 Credits
1.1.4 Science and Mathematics	6 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
<b>Total</b>	<b><u>150</u> Credits</b>

### Details of the Curriculum

1. General Basic Courses	36 Credits
1.1 Part I	21 Credits
1.1.1 Humanities (1 course) TU 110	3 Credits
1.1.2 Social Sciences (1 course) TU 120	3 Credits
1.1.3 Languages (3 courses) EL 171 EL 172 TU 140	9 Credits
1.1.4 Science and Mathematics (2 courses) ITS 100 TU 130	6 Credits
1.2 Part II	15 Credits
EC 210 GTS 101 GTS 133 GTS 202 GTS 231	
2. Core Courses	108 Credits
2.1 Compulsory Courses	93 Credits
2.1.1 Science and Mathematics (6 courses)	18 Credits
GTS 116 GTS 117 GTS 121 GTS 122 GTS 210 GTS 211	
2.1.2 Non CS Courses (20 courses)	47 Credits
ECS 370 ECS 371 ECS 382 GTS 302 IES 302 ITS 102 ITS 103 ITS 201 ITS 221 ITS 227 ITS 231 ITS 322 ITS 323 ITS 327 ITS 329 ITS 331 ITS 332 ITS 333 ITS 336 MTS 252	
2.1.3 CS Courses (8-10 courses)	28 Credits
CSS 221 CSS 223 CSS 224 CSS 225 CSS 321 CSS 322 CSS 323 CSS 400 (CSS 300 and CSS 403) or (CSS 300 and CSS 495 and CSS 496) 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	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	
<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>
EL 171 English Course II	3(3-1-5)
GTS 101 Skills Development for Technical Studies	3(3-1-5)
GTS 116 Mathematics for Technologists	3(3-1-5)
GTS 121 General Science I	3(3-1-5)
GTS 133 Environmental Studies	3(2-2-5)
ITS 100 Introduction to Computers and Programming	3(2-3-4)
MTS 252 Materials Science	3(3-0-6)
<b>Sub-Total</b>	<b>21(19-9-35)</b>

#### *Semester II*

EC 210 Introductory Economics	3(3-1-5)
EL 172 English Course III	3(3-1-5)
GTS 117 Mathematics for Technologists II	3(3-1-5)
GTS 122 General Science II	3(3-1-5)
ITS 102 Object-Oriented Programming	3(3-0-6)
ITS 103 Object-Oriented Programming Laboratory	1(0-3-0)
TU 130 Integrated Sciences and Technology	3(3-0-6)
<b>Sub-Total</b>	<b>19(18-7-32)</b>

### Third Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
CSS 321 Theory of Computation	3(3-0-6)
CSS 323 Compiler Design	3(3-0-6)
GTS 202 English Language Structures	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</b>	<b>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 336 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</b>	<b>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</b>	<b>22(20-7-39)</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</b>	<b>22(20-7-39)</b>

#### *Summer*

CSS 300 Computer Science Training (Except students who select to take Extended Training Track)	0(0-0-0)
<b>Sub-Total</b>	<b>0(0-0-0)</b>

### Second Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
CSS 224 Computer Architectures	3(3-0-6)
ECS 371 Digital Circuits	3(3-0-6)
GTS 210 Mathematics for Technologists III	3(3-1-5)
GTS 211 Differential Equations and Numerical Methods	3(3-0-6)
ITS 201 Discrete Mathematics	3(3-0-6)
ITS 221 Data Structures and Algorithms	3(3-0-6)
ITS 231 Data Structures and Algorithms Laboratory	1(0-3-0)
<b>Sub-Total</b>	<b>19(18-4-35)</b>

#### *Semester II*

CSS 221 Computer Graphics and Applications	3(2-3-4)
CSS 223 Principles of Programming Languages	3(3-0-6)
CSS 225 Operating System	3(3-0-6)
ECS 370 Digital Circuit Laboratory	1(0-3-0)
ECS 382 Microprocessors	3(3-0-6)
IES 302 Engineering Statistics	3(3-1-5)
ITS 227 Algorithm Design	3(3-1-5)
<b>Sub-Total</b>	<b>19(17-8-32)</b>

### Fourth Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</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</b>	<b>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</b>	<b>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</b>	<b>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</b>	<b>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</b>	<b>12(x-x-x)</b>

#### 3) Extended Training Track

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

#### Remark

\*Students who plan to take 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.