

## 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 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 General CS
- (2) Major in Software Engineering
- (3) Major in Informatics

### Structure and Components

<b>1. General Basic Courses</b>	<b>36</b>	<b>Credits</b>
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
<b>2. Core Courses</b>	<b>108</b>	<b>Credits</b>
2.1 Compulsory Courses	93	Credits
2.2 Compulsory Elective Courses	12	Credits
2.3 Technical Elective Courses	3	Credits
<b>3. Free Elective Courses</b>	<b>6</b>	<b>Credits</b>
<b>Total</b>	<b>150</b>	<b>Credits</b>

### Details of the Curriculum

<b>1. General Basic Courses</b>	<b>36</b>	<b>Credits</b>
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		
<b>2. Core Courses</b>	<b>108</b>	<b>Credits</b>
2.1 Compulsory Courses	93	Credits
2.1.1 Science and Mathematics (6 courses) GTS 116 GTS 117 GTS 121 GTS 122 GTS 210 GTS 211	18	Credits
2.1.2 Non CS Courses (20 courses) 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	47	Credits
2.1.3 CS Courses (8-10 courses) CSS 221 CSS 223 CSS 224 CSS 225 CSS 321 CSS 322 CSS 323 CSS 400 (CSS 300 and CSS 403) or (CSS 300, CSS 495 and CSS 496) or (CSS 499)	28	Credits
2.2 Compulsory Elective Courses	12	Credits
<b>2.2.1 Option I: General CS</b> 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		
<b>2.2.2 Option II: Software Engineering (4 courses)</b> CSS 411 CSS 412 CSS 413 CSS 414		
<b>2.2.3 Option III: Informatics (4 courses)</b> 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		
<b>3. Free Elective Courses</b>	<b>6</b>	<b>Credits</b>
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>150</b>	<b>Credits</b>

## CS CURRICULUM : 150 CREDITS

### First Year

#### **Semester I Credits (lecture-practice-self study hrs)**

EL	171	English Course II	3(3-0-6)
GTS	101	Skills Development for Technical Studies	3(3-1-5)
GTS	116	Mathematics for Technologists I	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)

**Sub-Total 21(19-8-36)**

#### **Semester II**

EC	210	Introductory Economics	3(3-0-6)
EL	172	English Course III	3(3-0-6)
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)

**Sub-Total 19(18-5-34)**

### Second Year

#### **Semester I Credits (lecture-practice-self study hrs)**

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)

**Sub-Total 19(18-4-35)**

#### **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)

**Sub-Total 19(17-8-32)**

### Third Year

#### **Semester I Credits (lecture-practice-self study hrs)**

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)

**Sub-Total 22(21-5-40)**

#### **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)

**Sub-Total 22(x-x-x)**

#### **Option II: Software Engineering**

CSS	411	Software Process and Quality Assurance	3(3-0-6)
CSS	412	Software Architecture	3(3-0-6)

**Sub-Total 22(20-7-39)**

#### **Option III: Informatics**

CSS	421	Pattern Recognition	3(3-0-6)
CSS	422	Knowledge Management and Discovery	3(3-0-6)

**Sub-Total 22(20-7-39)**

#### **Summer**

Select either Senior Project Track, Foreign Exchange Track, or Extended Training Track.

#### **For Senior Project Track and Foreign Exchange Track**

CSS	300	Computer Science Training	0(0-0-0)
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**Sub-Total 0(0-0-0)**

#### **For Extended Training Track**

XXX	xxx	Free Elective	3(x-x-x)
XXX	xxx	Free Elective	3(x-x-x)

**Sub-Total 6(x-x-x)**

### Fourth Year

#### **Semester I Credits (lecture-practice-self study hrs)**

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)

**Sub-Total 16(x-x-x)**

#### **Option II: Software Engineering**

CSS	413	Software Verification and Validation	3(3-0-6)
CSS	414	Software Project Management	3(3-0-6)

**Sub-Total 16(x-x-x)**

#### **Option III: Informatics**

CSS	423	Bioinformatics	3(3-0-6)
CSS	424	Multimedia Processing	3(3-0-6)

**Sub-Total 16(x-x-x)**

#### **Semester II**

##### **1) Senior Project Track**

CSS	403	Senior Project	6(0-18-0)
XXX	xxx	Free Elective	3(x-x-x)
XXX	xxx	Free Elective	3(x-x-x)

**Sub-Total 12(x-x-x)**

##### **2) Foreign Exchange Track**

CSS	495	Special Topics in Computer Science I	3(3-0-6)
CSS	496	Special Topics in Computer Science II	3(3-0-6)
XXX	xxx	Free Elective	3(x-x-x)
XXX	xxx	FreeElective	3(x-x-x)

**Sub-Total 12(x-x-x)**

##### **3) Extended Training Track**

CSS	499	Extended Computer Science Training	6(0-40-0)
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**Sub-Total 6(0-40-0)**