

## Civil Engineering (CE)

### Curriculum Outline

The Civil Engineering Program aims to produce graduates with sufficient fundamental knowledge in broad fields, and at the same time with strong knowledge in a specific area. This will enable graduates to serve the industrial sectors in Thailand where the need for specialists is increasing day by day. In this curriculum, two main areas of study are provided for selection. They are 1) general civil engineering, and 2) infrastructure engineering.

The general civil engineering option gives emphasis to various major fields of civil engineering, which include 1) structural engineering, 2) concrete engineering, 3) soil and foundation engineering, 4) water resources engineering, and 5) transportation engineering. The infrastructure engineering option, though still concentrating on the above major fields, puts more emphasis on knowledge related to infrastructure.

The total credits for major engineering subjects in both options are uniformly distributed to all five major fields, except for the field of structural engineering which has a slightly larger number of credits. For students in the infrastructure engineering option, a few major courses provided in the general civil engineering option are replaced by courses related to the infrastructure engineering field.

Further specialization can be achieved through the elective courses and the project. A practical training course is also provided to let students have a chance to practice civil engineering during their studies. In the practical training course, students will be placed in organizations that are related to their specialty in order to provide them with some practical experiences in their specialized field. In this curriculum, it is possible for students to study their elective courses at other universities, including foreign universities, as exchange students during the final semester. With special arrangements, it will also be possible for students to have thorough practical training during the final semester.

### Structure and Components

<b>1. General Basic Courses</b>	<b>30 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	9 Credits
<b>2. Core Courses</b>	<b>114 Credits</b>
2.1 Compulsory Courses	99 Credits
2.1.1 Science and Mathematics	21 Credits
2.1.2 Civil Engineering Courses	61 Credits
2.1.3 Non-Civil Engineering Courses	17 Credits
2.2 Compulsory Elective Courses	12 Credits
2.3 Technical Elective Courses	3 Credits
<b>3. Free Elective Courses</b>	<b>6 Credits</b>
<b>Total</b>	<b><u>150</u> Credits</b>

### Details of the Curriculum

<b>1. General Basic Courses</b>	<b>30 Credits</b>
1.1 Part I	21 Credits
1.1.1 Humanities TU 110	3 Credits
1.1.2 Social Sciences TU 120	3 Credits
1.1.3 Languages EL 171   EL 172   TU 140	9 Credits
1.1.4 Science and Mathematics ITS 100   TU 130	6 Credits
1.2 Part II	9 Credits
GTS 132   GTS 133   GTS 202	
<b>2. Core Courses</b>	<b>114 Credits</b>
2.1 Compulsory Courses	99 Credits
2.1.1 Science and Mathematics	21 Credits
MAS 116   MAS 117   MAS 210   SCS 126	
SCS 138   SCS 139   SCS 176   SCS 183	
SCS 184	
2.1.2 Civil Engineering Courses	61 Credits
CES 201   CES 215	
[(CES 303 and CES 407) or (CES 303	
and CES 405 and CES 406) or (CES 408)]	
CES 311   CES 312   CES 321   CES 322	
CES 331   CES 332   CES 333   CES 343	
CES 351   CES 352   CES 353   CES 361	
CES 371   CES 381   CES 382   CES 403	
CES 414   CES 426   CES 444	
2.1.3 Non-Civil Engineering Courses	17 Credits
ECS 203   GTS 302   IES 371   MES 211	
MES 300   MES 350	
2.2 Compulsory Elective Courses	12 Credits
Option I: General Civil Engineering	
CES 302   CES 315   CES 323   CES 341	
Option II: Infrastructure Engineering	
CES 305   CES 344   CES 424   CES 450	
2.3 Technical Elective Courses	3 Credits
Select 3 credits from the list of courses	
offered by Civil Engineering Program,	
except basic courses.	
CES xxx	
<b>3. Free Elective Courses</b>	<b>6 Credits</b>
Select any courses offered by the university,	
except basic courses.	
XXX xxx, XXX xxx	
<b>Total Credit Requirement</b>	<b><u>150</u> Credits</b>

## CE 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 132 Introduction to Biological Science	3(3-1-5)
MAS 116 Mathematics I	3(3-1-5)
SCS 126 Chemistry for Engineers	3(3-1-5)
SCS 138 Applied Physics I	3(3-1-5)
SCS 176 Chemistry Laboratory	1(0-3-0)
SCS 183 Physics Laboratory I	1(0-3-0)
TU 130 Integrated Sciences and Technology	3(3-0-6)
<b>Sub-Total</b>	<b>20(18-11-31)</b>

#### *Semester II*

EL 172 English Course III	3(3-1-5)
GTS 133 Environmental Studies	3(2-2-5)
ITS 100 Intro. to Computers and Programming	3(2-3-4)
MAS 117 Mathematics II	3(3-1-5)
SCS 139 Applied Physics II	3(3-1-5)
SCS 184 Physics Laboratory II	1(0-3-0)
TU 140 Thai Studies	3(3-0-6)
<b>Sub-Total</b>	<b>19(16-11-30)</b>

### Third Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
CES 311 Theory of Structures	3(3-0-6)
CES 331 Soil Mechanics	3(3-0-6)
CES 333 Soil Mechanics Laboratory	1(0-3-0)
CES 351 Concrete Technology	3(3-0-6)
CES 381 Hydraulics	3(3-0-6)
CES 382 Hydraulics Laboratory	1(0-3-0)
<i>Option I: General Civil Engineering</i>	
CES 315 Computational Methods in Civil Engineering	3(3-0-6)
CES 341 Transportation Engineering and Planning	3(3-0-6)
<b>Sub-Total</b>	<b>20(18-6-36)</b>
<i>Option II: Infrastructure Engineering</i>	
CES 344 Logistics System Engineering	3(3-0-6)
CES 450 Urban Engineering	3(3-0-6)
<b>Sub-Total</b>	<b>20(18-6-36)</b>

#### *Semester II*

CES 312 Structural Analysis	3(3-0-6)
CES 322 Reinforced Concrete Design	3(3-1-5)
CES 332 Foundation Engineering	3(3-0-6)
CES 343 Highway Engineering	3(3-0-6)
CES 352 Material Testing	1(0-3-0)
CES 353 Construction Engineering and Management	3(3-0-6)
CES 444 Hydraulic Engineering	3(3-0-6)
<b>Sub-Total</b>	<b>19(18-4-35)</b>

#### *Summer*

CES 303 Civil Engineering Training	0(0-0-0)
(Except for students who will select to take CES 408)	

### Second Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
CES 201 Engineering Materials	3(3-0-6)
CES 215 Applied Mathematics in Civil Engineering	3(3-0-6)
CES 361 Surveying	3(2-3-4)
GTS 202 English Language Structures	3(3-1-5)
MAS 210 Mathematics III	3(3-1-5)
MES 300 Engineering Drawing	3(2-3-4)
MES 350 Engineering Statics	3(3-1-5)
<b>Sub-Total</b>	<b>21(19-9-35)</b>

#### *Semester II*

CES 371 Mechanics of Solids I	3(3-1-5)
ECS 203 Basic Electrical Engineering	3(3-1-5)
GTS 302 Technical Writing	2(2-1-3)
IES 371 Engineering Management	3(3-0-6)
MES 211 Thermofluids	3(3-1-5)
TU 110 Integrated Humanities	3(3-0-6)

#### *Option I: General Civil Engineering*

CES 302 Engineering Hydrology	3(3-0-6)
<b>Sub-Total</b>	<b>20(20-4-36)</b>

#### *Option II: Infrastructure Engineering*

CES 305 Urban Hydrology	3(3-0-6)
<b>Sub-Total</b>	<b>20(20-4-36)</b>

### Fourth Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
CES 321 Timber and Steel Design	3(3-1-5)
CES 403 Seminar	1(0-3-0)
CES 414 Finite Element Methods in Engineering	3(3-0-6)
CES 426 Durability of Concrete Structures	3(3-0-6)
CES xxx Technical Elective	3(x-x-x)
TU 120 Integrated Social Sciences	3(3-0-6)
<i>Option I: General Civil Engineering</i>	
CES 323 Advanced Structural Concrete Design	3(3-0-6)
<b>Sub-Total</b>	<b>19(x-x-x)</b>
<i>Option II: Infrastructure Engineering</i>	
CES 424 Bridge Engineering	3(3-0-6)
<b>Sub-Total</b>	<b>19(x-x-x)</b>
<i>Semester II</i>	
XXX xxx Free Elective	3(x-x-x)
XXX xxx Free Elective	3(x-x-x)

and one of the following 3 tracks:

#### 1) Senior Project Track

CES 407 Senior Project	6(0-18-0)
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#### 2) Foreign Exchange Track

CES 405 Special Study in Civil Engineering I	3(3-0-6)
CES 406 Special Study in Civil Engineering II	3(3-0-6)

#### 3) Extended Training Track

CES 408 Extended Civil Engineering Training	6(0-40-0)
<b>Sub-Total</b>	<b>12(x-x-x)</b>

Note: Students who plan to take the Extended Civil Engineering Training are advised to take the two free elective courses in the summer session of the 3<sup>rd</sup> year.