

## 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 the graduates to serve the industrial sectors in Thailand where the need for specialists is increasing day by day. In this curriculum, four main areas of study are provided for selection. They are 1) general civil engineering, 2) infrastructure engineering, 3) construction management, and 4) building facilities 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 other three options, though still concentrating on the above major fields, put more emphasis on different groups of civil engineering works related to infrastructure, construction management and building facilities.

The total credits for major engineering subjects in all 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, construction management, and building facilities engineering options, a few major courses provided in the general civil engineering option will be replaced by courses related to their respective fields. The differences between the four options of study will be from the second years of the curriculum.

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 experience 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 and Basic Courses in Science and Mathematics</b>	<b>48 Credits</b>
1.1 Humanities	6 Credits
1.2 Social Sciences	3 Credits
1.3 English Language	9 Credits
1.4 Science and Mathematics	30 Credits
<b>2. Core Courses</b>	<b>96 Credits</b>
2.1 Compulsory Courses	72 Credits
2.2 Compulsory Elective Courses	21 Credits
2.3 Technical Elective Course	3 Credits
<b>3. Free Elective Courses</b>	<b>6 Credits</b>
<b>Total</b>	<b><u>150 Credits</u></b>

### Details of the Curriculum

<b>1. General Basic Courses and Basic Courses in Science and Mathematics</b>	<b>48 Credits</b>
1.1 Humanities (2 courses) TU 110 TU 140	6 Credits
1.2 Social Sciences (1 course) TU 120	3 Credits
1.3 English Language (3 courses) EL 171 EL 172 EL 210	9 Credits
1.4 Science and Mathematics (12 courses) GTS 132 GTS 133 MAS 116 MAS 117 MAS 210 SCS 126 SCS 138 SCS 139 SCS 176 SCS 183 SCS 184 TU 130	30 Credits
<b>2. Core Courses</b>	<b>96 Credits</b>
2.1 Compulsory Courses (26-28 courses)	72 Credits
BFS 307 BFS 309 CES 215 CES 311 CES 312 CES 321 CES 322 CES 331 CES 333 CES 343 CES 351 CES 352 CES 353 CES 361 CES 371 CES 381 CES 382 CES 403 [(CES 303 & CES 407) or (CES 303 & CES 405 & CES 406) or (CES 408)] CES 414 ECS 303 EMS 211 GTS 302 ITS 050 MES 231 MES 300	
2.2 Compulsory Elective Courses	21 Credits
2.2.1 Option I: General Civil Engineering (7 courses) CES 302 CES 304 CES 315 CES 323 CES 332 CES 341 CES 444	
2.2.2 Option II: Infrastructure Engineering (7 courses) CES 302 CES 332 CES 341 CES 424 CES 425 CES 444 CES 450	
2.2.3 Option III: Construction Management (7 courses) CES 304 CES 315 CES 341 CES 354 CES 355 CES 424 CES 425	
2.2.4 Option IV: Building Facilities Engineering (7 courses) BFS 302 BFS 305 BFS 308 BFS 406 CES 323 CES 332 EPS 301	
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	

**Total Credit Requirement** **150 Credits**

## 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)
ITS 050 Intro. to Computers and Programming	3(2-3-4)
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 Science and Technology	3(3-0-6)
<b>Sub-Total</b>	<b>20(17-13-30)</b>

### *Semester II*

EL 172 English Course III	3(3-1-5)
GTS 132 Introduction to Life Sciences	3(3-1-5)
GTS 133 Environmental Studies	3(2-2-5)
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(17-9-31)</b>

### Second Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
BFS 307 Engineering Materials	3(3-1-5)
CES 215 Applied Mathematics in Civil Engineering	3(3-0-6)
CES 361 Surveying	3(2-3-4)
EL 210 English for Engineering I	3(3-1-5)
MAS 210 Mathematics III	3(3-1-5)
MES 231 Engineering Mechanics	3(3-1-5)
MES 300 Engineering Drawing	3(2-3-4)
<b>Sub-Total</b>	<b>21(19-10-34)</b>

### *Semester II*

CES 371 Mechanics of Solids I	3(3-1-5)
ECS 303 Basic Electrical Engineering	3(3-1-5)
EMS 211 Thermofluids	3(3-1-5)
GTS 302 Technical Writing	2(2-1-3)
TU 110 Integrated Humanities	3(3-0-6)
<b>Option I: General Civil Engineering</b>	
CES 302 Engineering Hydrology	3(3-0-6)
CES 304 Engineering Geology	3(3-0-6)
<b>Sub-Total</b>	<b>20(20-4-36)</b>
<b>Option II: Infrastructure Engineering</b>	
CES 302 Engineering Hydrology	3(3-0-6)
TU 120 Integrated Social Science	3(3-0-6)
<b>Sub-Total</b>	<b>20(20-4-36)</b>
<b>Option III: Construction Management</b>	
CES 304 Engineering Geology	3(3-0-6)
TU 120 Integrated Social Science	3(3-0-6)
<b>Sub-Total</b>	<b>20(20-4-36)</b>
<b>Option IV: Building Facilities Engineering</b>	
BFS 302 Computer Networking for Buildings	3(3-0-6)
TU 120 Integrated Social Science	3(3-0-6)
<b>Sub-Total</b>	<b>20(20-4-36)</b>

## CE Curriculum : 150 Credits

### 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)
<b>Option I: General Civil Engineering</b>	
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>
<b>Option II: Infrastructure Engineering</b>	
CES 341 Transportation Engineering and Planning	3(3-0-6)
CES 450 Urban Engineering	3(3-0-6)
<b>Sub-Total</b>	<b>20(18-6-36)</b>
<b>Option III: Construction Management</b>	
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>
<b>Option IV: Building Facilities Engineering</b>	
BFS 308 Air Conditioning Systems for Buildings	3(3-0-6)
EPS 301 Basic Electromechanical Energy Conversion	3(3-1-5)
<b>Sub-Total</b>	<b>20(18-7-35)</b>

### *Semester II*

CES 312 Structural Analysis	3(3-0-6)
CES 322 Reinforced Concrete Design	3(3-1-5)
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)
<b>Option I: General Civil Engineering</b>	
CES 332 Foundation Engineering	3(3-0-6)
CES 444 Hydraulic Engineering	3(3-0-6)
<b>Sub-Total</b>	<b>19(18-4-35)</b>
<b>Option II: Infrastructure Engineering</b>	
CES 332 Foundation Engineering	3(3-0-6)
CES 444 Hydraulic Engineering	3(3-0-6)
<b>Sub-Total</b>	<b>19(18-4-35)</b>
<b>Option III: Construction Management</b>	
CES 354 Civil Engineering Project Appraisal	3(3-0-6)
CES 425 Construction Methods and Technologies	3(3-0-6)
<b>Sub-Total</b>	<b>19(18-4-35)</b>
<b>Option IV: Building Facilities Engineering</b>	
BFS 305 Fluid Machines for Buildings	3(3-0-6)
CES 332 Foundation 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)
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(Except for students who will select to take CES 408)

### Fourth Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
BFS 309 Durability of Construction Materials	3(3-0-6)
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 xxx Technical Elective	3(x-x-x)
<b>Option I: General Civil Engineering</b>	
CES 323 Advanced Structural Concrete Design	3(3-0-6)
TU 120 Integrated Social Science	3(3-0-6)
<b>Sub-Total</b>	<b>19(x-x-x)</b>
<b>Option II: Infrastructure Engineering</b>	
CES 424 Bridge Engineering	3(3-0-6)
CES 425 Construction Methods and Technologies	3(3-0-6)
<b>Sub-Total</b>	<b>19(x-x-x)</b>
<b>Option III: Construction Management</b>	
CES 355 Construction Estimating and Tendering	3(3-0-6)
CES 424 Bridge Engineering	3(3-0-6)
<b>Sub-Total</b>	<b>19(x-x-x)</b>
<b>Option IV: Building Facilities Engineering</b>	
BFS 406 Building Protection, Repair and Maintenance	3(3-0-6)
CES 323 Advanced Structural Concrete Design	3(3-0-6)
<b>Sub-Total</b>	<b>19(x-x-x)</b>

### *Semester II*

XXX xxx Free Elective	3(x-x-x)
XXX xxx Free Elective	3(x-x-x)
CES 407 Senior Project	6(0-18-0)
or	
(CES 405 Special Study in Civil Engineering I	3(3-0-6)
CES 406 Special Study in Civil Engineering II	3(3-0-6)
or	
CES 408 Extended Civil Engineering Training	6(0-40-0)
<b>Sub-Total</b>	<b>12(x-x-x)</b>