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

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

Details of the Curriculum

1. General Basic Courses and Basic Courses in Science and Mathematics — 48 Credits

1.1 Humanities (2 courses) — 6 Credits
TU 110 TU 140

1.2 Social Sciences (1 course) — 3 Credits
TU 120

1.3 English Language (3 courses) — 9 Credits
EL 171 EL 172 EL 210

1.4 Science and Mathematics (12 courses) — 30 Credits
GTS 132 GTS 133 MAS 116 MAS 117 MAS 210
SCS 126 SCS 138 SCS 139 SCS 176 SCS 183
SCS 184 TU 130

2. Core Courses — 96 Credits

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

3. Free Elective Courses — 6 Credits
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

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

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)
		Sub-Total	**20(17-13-30)**

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)
		Sub-Total	**19(17-9-31)**

Second Year

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

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)
		Sub-Total	**21(19-10-34)**

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)
		Option I: General Civil Engineering	
CES	302	Engineering Hydrology	3(3-0-6)
CES	304	Engineering Geology	3(3-0-6)
		Sub-Total	**20(20-4-36)**
		Option II: Infrastructure Engineering	
CES	302	Engineering Hydrology	3(3-0-6)
TU	120	Integrated Social Science	3(3-0-6)
		Sub-Total	**20(20-4-36)**
		Option III: Construction Management	
CES	304	Engineering Geology	3(3-0-6)
TU	120	Integrated Social Science	3(3-0-6)
		Sub-Total	**20(20-4-36)**
		Option IV: Building Facilities Engineering	
BFS	302	Computer Networking for Buildings	3(3-0-6)
TU	120	Integrated Social Science	3(3-0-6)
		Sub-Total	**20(20-4-36)**

CE Curriculum : 150 Credits

Third Year

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

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)
		Option I: General Civil Engineering	
CES	315	Computational Methods in Civil Engineering	3(3-0-6)
CES	341	Transportation Engineering and Planning	3(3-0-6)
		Sub-Total	**20(18-6-36)**
		Option II: Infrastructure Engineering	
CES	341	Transportation Engineering and Planning	3(3-0-6)
CES	450	Urban Engineering	3(3-0-6)
		Sub-Total	**20(18-6-36)**
		Option III: Construction Management	
CES	315	Computational Methods in Civil Engineering	3(3-0-6)
CES	341	Transportation Engineering and Planning	3(3-0-6)
		Sub-Total	**20(18-6-36)**
		Option IV: Building Facilities Engineering	
BFS	308	Air Conditioning Systems for Buildings	3(3-0-6)
EPS	301	Basic Electromechanical Energy Conversion	3(3-1-5)
		Sub-Total	**20(18-7-35)**

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)
		Option I: General Civil Engineering	
CES	332	Foundation Engineering	3(3-0-6)
CES	444	Hydraulic Engineering	3(3-0-6)
		Sub-Total	**19(18-4-35)**
		Option II: Infrastructure Engineering	
CES	332	Foundation Engineering	3(3-0-6)
CES	444	Hydraulic Engineering	3(3-0-6)
		Sub-Total	**19(18-4-35)**
		Option III: Construction Management	
CES	354	Civil Engineering Project Appraisal	3(3-0-6)
CES	425	Construction Methods and Technologies	3(3-0-6)
		Sub-Total	**19(18-4-35)**
		Option IV: Building Facilities Engineering	
BFS	305	Fluid Machines for Buildings	3(3-0-6)
CES	332	Foundation Engineering	3(3-0-6)
		Sub-Total	**19(18-4-35)**

Summer

CES	303	Civil Engineering Training	0(0-0-0)

(Except for students who will select to take CES 408)

Fourth Year

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

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)
		Option I: General Civil Engineering	
CES	323	Advanced Structural Concrete Design	3(3-0-6)
TU	120	Integrated Social Science	3(3-0-6)
		Sub-Total	**19(x-x-x)**
		Option II: Infrastructure Engineering	
CES	424	Bridge Engineering	3(3-0-6)
CES	425	Construction Methods and Technologies	3(3-0-6)
		Sub-Total	**19(x-x-x)**
		Option III: Construction Management	
CES	355	Construction Estimating and Tendering	3(3-0-6)
CES	424	Bridge Engineering	3(3-0-6)
		Sub-Total	**19(x-x-x)**
		Option IV: Building Facilities Engineering	
BFS	406	Building Protection, Repair and Maintenance	3(3-0-6)
CES	323	Advanced Structural Concrete Design	3(3-0-6)
		Sub-Total	**19(x-x-x)**

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