Curriculum (2018-19 Batches onwards)

Department of Civil & Structural Engineering

1. Definition of Credit:

1 Hr. Lecture (L) per week 1 credit

1 Hr. Tutorial (T) per week 1 credit

2 Hr. Practical (P) per week 1 credit

2. Credits:

A Credits of **168** for a student to be eligible to get Under Graduate degree in Engineering. A student will be eligible to get Under Graduate degree with Honors, if he/she completes an additional 20 credits. These could be acquired through MOOCs.

3. Structure of Undergraduate Engineering program:

S.No.	Category	Breakup of Credits (Total 168)
1	Humanities and Social Sciences including Management courses	**06**
2	Basic Science courses	**26**
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	**20**
4	Professional core courses	**83**
5	Professional Elective courses relevant to chosen specialization/branch	**12**
6	Open subjects – Electives from other technical and /or emerging subjects	**06**
7	Project work, seminar and internship in industry or elsewhere	**15**
8	Mandatory Courses	**08*(Non-Credit)**

4. Course code and definition:

BSC: Basic Science Courses **ESC:** Engineering Science Courses **HSMC:** Humanities and Social Sciences including Management courses **PCC:** Professional core courses **PEC**: Professional Elective courses **OEC:** Open Elective courses **LC**: Laboratory course **MC:** Mandatory courses

1. HUMANITIES & SOCIAL SCIENCES INCLUDING MANAGEMENT

Semester	Course Title	Hours/Week			Credit
		L	T	P	
2	English	2	1	0	3
7	Professional Practice, Law & Ethics	3	0	0	3
Total Learning Credits					**6**

2. BASIC SCIENCE COURSES

Semester	Course Title	Hours/Week			Credit
		L	T	P	
1	Mathematics –I (Calculus, Multivariable Calculus and Linear Algebra)	3	1	0	4
1	Engineering Chemistry	3	1	2	5
2	Physics (Mechanics & Mechanics of Solids)	3	1	2	5
2	Mathematics –II (Differential Equations & Numerical Methods)	3	1	0	4
3	Mathematics – III ((Transform & Discrete Mathematics)	3	1	0	4
4	Mathematics – IV (Probability Theory and Statistics)	3	1	0	4
Total Learning Credits					**26**

3. ENGINEERING SCIENCE COURSE

Semester	Course Title	Hours/Week			Credit
		L	T	P	
1	Basic Electrical Engineering	3	0	4	5
1	Workshop Manufacturing Practices	0	0	3	2
1	Engineering Graphics & Design	1	0	4	3
2	Programming for Problem Solving	3	0	4	5
3	Engineering Mechanics	2	1	0	3
5	CADD Lab –I Revit Architecture and BIM	0	0	4	2
Total Learning Credits					**20**

4. PROFESSIONAL CORE COURSES

Semester	Course Title	Hours/Week			Credit
		L	T	P	
3	Engineering Geology	3	0	0	3
3	Fluid Mechanics	2	1	0	3
3	Construction Materials	3	0	0	3
3	Solid Mechanics	2	1	0	3
3	Construction Materials Laboratory	0	0	4	2
3	Solid Mechanics Laboratory	0	0	4	2
4	Surveying	3	0	0	3
4	Concrete Technology	3	0	0	3
4	Hydraulic Engineering	2	1	0	3
4	Geotechnical Engineering	3	0	0	3
4	Structural Mechanics - I	2	1	0	3
4	Surveying Laboratory	0	0	4	2
4	Fluid Mechanics & Hydraulic Engineering Laboratory	0	0	4	2
4	Geotechnical Engineering Laboratory	0	0	4	2
5	Hydrology & Water Resources Engineering	3	0	0	3
5	Environmental Engineering - I	3	0	0	3
5	Transportation Engineering	3	0	0	3
5	Structural Mechanics - II	2	1	0	3
5	Remote Sensing & GIS	3	0	0	3
5	Transportation Engineering Laboratory	0	0	4	2
5	Remote Sensing & GIS Laboratory	0	0	4	2
6	Design of Steel Structures	2	1	0	3
6	Design of Concrete Structures - I	2	1	0	3
6	Environmental Engineering - II	3	0	0	3
6	Estimation, Costing & Valuation	2	1	0	3
6	STADD Pro lab	0	0	4	2
6	Environmental Engineering Laboratory	0	0	4	2
7	Bridge Engineering	3	0	0	3
7	Design of Concrete Structures - II	2	1	0	3
7	Cadd Lab – II Design	0	0	4	2
8	Structural Dynamics	3	0	0	3
Total Learning Credits					**83**

5. PROFESSIONAL ELECTIVE COURSES

Semester	Course Title	Hours/Week			Credit
		L	T	P	
6	Foundation Engineering	3	0	0	3
	Geotechnical Design				
	Offshore Engineering				
	Rock Mechanics				
	Environmental Geo-technology				
	Ground improvement techniques				
7	Pavement Design	3	0	0	3
	Public Transportation Systems				
	Traffic Engineering and Management				
	Urban Transportation Planning				
	Geometric Design of Highways				
	Highway Construction and Management				
	Railway Engineering				
8	Ecological Engineering	3	0	0	3
	Rural Water Supply and Onsite Sanitation Systems				
	Water and Air Quality Modeling				
	Solid and Hazardous Waste Management				
	Air and Noise Pollution and Control				
	Environmental Impact Assessment and Life Cycle Analyses				
8	Wood Structures	3	0	0	3
	Masonry Structures				
	Structural Analysis by Matrix Methods				
	Pre stressed Concrete				
	Industrial Structures				
	Earthquake Engineering				
Total Learning Credits					**12**

6. OPEN ELECTIVE COURSES

Semester	Course Title	Hours/Week			Credit
		L	T	P	
6	Cloud Computing	3	0	0	3
	Web Design				
	Digital Image Processing				
	Data Analysis				
	German Primer				
	Astro – Physics				
	Business Administration				
	Chemistry in Crime Investigation				
	French Primer				
	Japanese				
	Bioinformatics				
	Communication Skills				
	Finance for Non Finance Managers				
	Fuel Cell and Batteries				
	Basic of Hindi				
7	Autotronics	3	0	0	3
	Artificial Intelligence and Machine Learning				
	Nana Technology and Surface Engineering				
	Disaster Preparedness & Planning				
	Engineering Economics				
	HR Management				
	Nuclear and Particle Physics				
	Internet of Things (IOT)				
	Psychology				
	Statistical Methods with Excel				
	Key Board				
	Logistics and Supply Chain				
	Panini Grammar				
	Violin				
	Vocal Music				
Total Learning Credits					**6**

7. PROJECT AND INTERNSHIP

Semester	Course Title	Hours/Week			Credit
		L	T	P	
7	Project work Phase –I	0	0	0	2
3-6	Survey Camp, In-plant Training & Internship**	0	0	0	3
8	Project work Phase – II	0	0	0	10
Total Learning Credits					**15**

****Evaluated 7 semester only.**

8. MANDATORY COURSES*:

Semester	Course Title	Hours/Week			Credit
		L	T	P	
2	Environmental Sciences and Engineering	2	0	0	2*
4	Sanskrit and Indian Culture	2	0	0	2*
3to6	Soft Skill	-	-	-	4*
Total Learning Credits					**8***

(* For mandatory non-credit courses, these will be graded as Pass or Fail (P/F). Thus the grades obtained will not affect the grade point average. However, they will appear on the grade sheet.)

INDUCTION PROGRAM

Induction program (mandatory)	3 weeks duration
Induction program for students to be offered right at the start of the first year.	Physical activity Creative Arts• Universal Human Values• Literary• Proficiency Modules• Lectures by Eminent People• Visits to local Areas• Familiarization to Dept./Branch• & Innovations

Semester-wise structure of curriculum

[L= Lecture, T = Tutorials, P = Practical & C = Credits]

Semester I (First year]

Sl.No	Category	Code	Course Title	Hours/ Week			Credit
				L	T	P	
1	BSC	CBSMAC8T10	Mathematics - I(Calculus, Multivariable Calculus and Linear Algebra)	3	1	0	4
2	BSC	CBSCH18T20	Engineering Chemistry	3	0	0	3
3	ESC	CESEE18T30	Basic Electrical Engineering	3	0	0	3
4	ESC	CESME18P50	Engineering Graphics & Design	2	0	2	3
5	BSC	CBSCH18P60	Chemistry Lab	0	0	3	2
6	ESC	CESEE18P70	Basic Electrical Engineering Lab	0	0	3	2
Total Credits							**17**

Semester II (First year]

Sl.No	Category	Code	Course Title	Hours/Week			Credit Points
				L	T	P	
1	HSMC	CHSEN18T10	English	2	1	0	3
2	BSC	CBSMAE8T20	Mathematics - II (Differential Equations & Numerical Methods)	3	1	0	4
3	BSC	CBSPH28T30	Applied Physics For Engineers	3	0	0	3
4	ESC	CESCS18T40	Programming For Problem Solving	2	1	0	3
5	MC*	CMCCH28T50	Environmental Sciences and Engineering*	2	0	0	2*
6	BSC	CBSPH28P60	Applied Engineering Physics Lab	0	0	3	2
7	ESC	CESCE18P60	Programming For Problem Solving Lab	0	0	4	2
8	ESC	CESME18P70	Workshop/Manufacturing Practices	0	0	3	2
Total Credits							**19+2***

Semester III (Second year]

Sl.No	Category	Code	Course Title	Hours/Week			Credit
				L	T	P	
1	BSC	BSEF183T10	Mathematics-III (Transform & Discrete Mathematics)	3	1	0	4
2	ESC	BSEF183T20	Engineering Mechanics	2	1	0	3
3	PCC	BSEF183T30	Engineering Geology	3	0	0	3
4	PCC	BSEF183T40	Fluid Mechanics	2	1	0	3
5	PCC	BSEF183T50	Construction Materials	2	1	0	3
6	PCC	BSEF183T60	Solid Mechanics	2	1	0	3
7	PCC	BSEF183P70	Construction Materials Laboratory	0	0	3	2
8	PCC	BSEF183P80	Solid Mechanics Laboratory	0	0	3	2
9	MC*	BETF183MC3	Soft Skill-I	0	0	0	1*
Total Credits							**23+1***

Semester IV (Second year]

Sl.No	Category	Code	Course Title	Hours/Week			Credit
				L	T	P	
1	BSC	CBSMAD8T10	Mathematics-IV (Probability Theory and Statistics)	3	1	0	4
2	PCC	BSEF184T20	Hydraulic Engineering	2	1	0	3
3	PCC	BSEF184T30	Structural Mechanics - I	2	1	0	3
4	PCC	BSEF184T40	Geotechnical Engineering	2	1	0	3
5	PCC	BSEF184T50	Surveying	3	0	0	3
6	PCC	BSEF184T60	Concrete Technology	3	0	0	3
7	PCC	BSEF184P70	Surveying Laboratory	0	0	3	2
8	PCC	BSEF184P80	Geotechnical Engineering Laboratory	0	0	3	2
9	PCC	BSEF184P90	Fluid Mechanics & Hydraulic Engineering Laboratory	0	0	3	2
10	MC*	BETF18MC02	Sanskrit and Indian Culture	2	0	0	2*
11	MC*	BETF18MC04	Soft Skill-II	0	0	0	1*
Total Credits							**25+3***

Semester V (Third year]

Sl.No	Category	Code	Course Title	Hours/Week			Credit
				L	T	P	
1	PCC	BSEF185T10	Hydrology & Water Resources Engineering	3	0	0	3
2	PCC	BSEF185T20	Environmental Engineering I	3	0	0	3
3	PCC	BSEF185T30	Transportation Engineering	3	0	0	3
4	PCC	BSEF185T40	Structural Mechanics - II	2	1	0	3
5	PCC	BSEF185T50	Remote Sensing& GIS	3	0	0	3
6	PCC	BSEF185P60	Transportation Engineering Laboratory	0	0	3	2
7	PCC	BSEF185P70	Remote Sensing& GIS Laboratory	0	0	3	2
8	ESC	BCEF185P80	CADD Lab – I (Revit Architecture and BIM)	0	0	3	2
9	MC*	BETF18MC05	Soft Skill-III	0	0	0	1*
Total Credits							**21+1***

Semester VI (Third year]

Sl.No	Category	Code	Course Title	Hours/Week			Credit
				L	T	P	
1	PCC	BSEF186T10	Design of Steel Structures	2	1	0	3
2	PCC	BSEF186T20	Design of Concrete Structures -I	2	1	0	3
3	PCC	BSEF186T30	Environmental Engineering II	3	0	0	3
4	PCC	BSEF186T40	Estimation ,Costing & Valuation	2	1	0	3
5	PEC	BSEF186EA0-EF0	Elective-I	3	0	0	3
7	OEC	BSEF186OEA-OEO	Open Elective-I	3	0	0	3
7	PCC	BSEF186P70	STADD PRO lab	0	0	3	2
8	PCC	BSEF186P80	Environmental Engineering Laboratory	0	0	3	2
9	MC*	BETF18MC06	Soft Skill-IV	0	0	0	1*
Total Credits							**22+1***

Semester VII (Final year]

Sl. No	Category	Code	Course Title	Hours/Week			Credit
				L	T	P	
1	HSCM	BSEF187T10	Professional Practice, Law & Ethics	3	0	0	3
2	PCC	BSEF187T20	Bridge Engineering	3	0	0	3
3	PCC	BSEF187T30	Design of Concrete Structures -II	2	1	0	3
4	PEC	BSEF187EG0 -EM0	Elective-II	3	0	0	3
5	OEC	BSEF187OEP -OE4	Open Elective – II	3	0	0	3
6	PCC	BSEF187P60	CADD Lab –II Design	0	0	3	2
7	PROJ	BSEF187Z70	Project work Phase–I	0	0	4	2
8	PROJ	BSEF187P80	Extensive Survey, In-plant Training & Internship**	0	0	0	3
Total Credits							**22**

Semester VIII (Final year]

Sl.No	Category	Code	Course Title	Hours/Week			Credit
				L	T	P	
1	PCC	BSEF188T10	Structural Dynamics	3	0	0	3
2	PEC	BSEF188EN0-ES0	Elective-III	3	0	0	3
3	PEC	BSEF188ET0-EY0	Elective-IV	3	0	0	3
4	PROJ	BSEF188Z40	Project work Phase-II	0	0	12	10
Total Credits							**19**

PROFESSIONAL ELECTIVE COURSES

Sl.No	Category	Code	Course Title	Hours/Week			Credit
				L	T	P	
PEC - I Geotechnical Engineering							
1	PEC	BSEF186EA0	Foundation Engineering	3	0	0	3
2		BSEF186EB0	Geotechnical Design	3	0	0	3
3		BSEF186EC0	Offshore Engineering	3	0	0	3
4		BSEF186ED0	Rock Mechanics	3	0	0	3
5		BSEF186EE0	Environmental Geo-technology	3	0	0	3
6		BSEF186EF0	Ground improvement techniques	3	0	0	3
	PEC - II Transportation Engineering						
7	PEC	BSEF187EG0	Railway Engineering	3	0	0	3
8		BSEF187EH0	Pavement Design	3	0	0	3
9		BSEF187EI0	Public Transportation Systems	3	0	0	3
10		BSEF187EJ0	Traffic Engineering and Management	3	0	0	3
11		BSEF187EK0	Urban Transportation Planning	3	0	0	3
12		BSEF187EL0	Geometric Design of Highways	3	0	0	3
13		BSEF187EM0	Highway Construction and Management	3	0	0	3
PEC – III Environmental Engineering							
18	PEC	BSEF188EN0	Ecological Engineering	3	0	0	3
19		BSEF188EO0	Rural Water Supply and Onsite Sanitation Systems	3	0	0	3
20		BSEF188EP0	Water and Air Quality Modeling	3	0	0	3
21		BSEF188EQ0	Solid and Hazardous Waste Management	3	0	0	3
22		BSEF188ER0	Air and Noise Pollution and Control	3	0	0	3
23		BSEF188ES0	Environmental Impact Assessment and Life Cycle Analyses	3	0	0	3
	PEC – IV Structural Engineering						
24	PEC	BSEF188ET0	Wood Structures	3	0	0	3
25		BSEF188EU0	Masonry Structures	3	0	0	3
26		BSEF188EV0	Structural Analysis by Matrix Methods	3	0	0	3
27		BSEF188EW0	Pre stressed Concrete	3	0	0	3
28		BSEF188EX0	Industrial Structures	3	0	0	3
29		BSEF188EY0	Earthquake Engineering	3	0	0	3

OPEN ELECTIVE COURSES

Sl.No	Category	Code	Course Title	Hours/Week			Credit
				L	T	P	
1	OEC-I	BSEF186OEA	Cloud Computing	3	0	0	3
2		BSEF186OEB	Web Design	3	0	0	3
3		BSEF186OEC	Digital Image Processing	3	0	0	3
4		BSEF186OED	Data Analysis	3	0	0	3
5		BSEF186OEE	German Primer	3	0	0	3
6		BSEF186OEF	Astro – Physics	3	0	0	3
7		BSEF186OEG	Business Administration	3	0	0	3
8		BSEF186OEH	Chemistry in Crime Investigation	3	0	0	3
9		BSEF186OEI	French Primer	3	0	0	3
10		BSEF186OEJ	Japanese	3	0	0	3
11		BSEF186OEK	Bioinformatics	3	0	0	3
12		BSEF186OEL	Communication Skills	3	0	0	3
13		BSEF186OEM	Finance for Non Finance Managers	3	0	0	3
14		BSEF186OEN	Fuel Cell and Batteries	3	0	0	3
15		BSEF186OEO	Basic of Hindi	3	0	0	3
16	OEC - II	BSEF187OEP	Disaster Preparedness & Planning	3	0	0	3
17		BSEF187OEQ	Autotronics	3	0	0	3
18		BSEF187OER	Artificial Intelligence and Machine Learning	3	0	0	3
19		BSEF187OES	Nana Technology and Surface Engineering	3	0	0	3
20		BSEF187OET	Engineering Economics	3	0	0	3
21		BSEF187OEU	HR Management	3	0	0	3
22		BSEF187OEV	Nuclear and Particle Physics	3	0	0	3
23		BSEF187OEW	Internet of Things (IOT)	3	0	0	3
24		BSEF187OEX	Psychology	3	0	0	3
25		BSEF187OEY	Statistical Methods with Excel	3	0	0	3
26		BSEF187OEZ	Key Board	3	0	0	3
27		BSEF187OE1	Logistics and Supply Chain	3	0	0	3
28		BSEF187OE2	Panini Grammar	3	0	0	3
29		BSEF187OE3	Violin	3	0	0	3
30		BSEF187OE4	Vocal Music	3	0	0	3