

# **SARALA BIRLA UNIVERSITY RANCHI**



Established under the Sarala Birla University Act 2017 Govt. of Jharkhand as per  
Section 2(f) of UGC Act. 1956

## **CURRICULUM FOR**

**B.Tech.**

**In**

**Civil Engineering**

**(Based on AICTE- CBCS)**

**Effective from 2019-20**

## DEFINATION OF CREDITS

1 Hr. Lecture (L) per week	1 credit
1 Hr. Tutorial (T) per week	1 credit
1 Hr. Practical (P) per week	0.5 credit
2 Hours Practical (Lab)/week	1 credit
4 Hours Practical (Lab)/week	2 credit

## COURSE CODE DEFINATIONS

Course code	Definitions
<b>BSC</b>	Basic Science Courses
<b>ESC</b>	Engineering Science Courses
<b>HSMC</b>	Humanities, Social Science including Management Courses
<b>MC</b>	Mandatory Courses
<b>PCC-CE</b>	Professional Core Courses
<b>PEC-CE</b>	Professional Elective Courses
<b>OEC</b>	Open Elective Courses
<b>CE-P1</b>	Project Stage-I
<b>CE-P2</b>	Project Stage-II
<b>CE-P3</b>	Project Stage-III

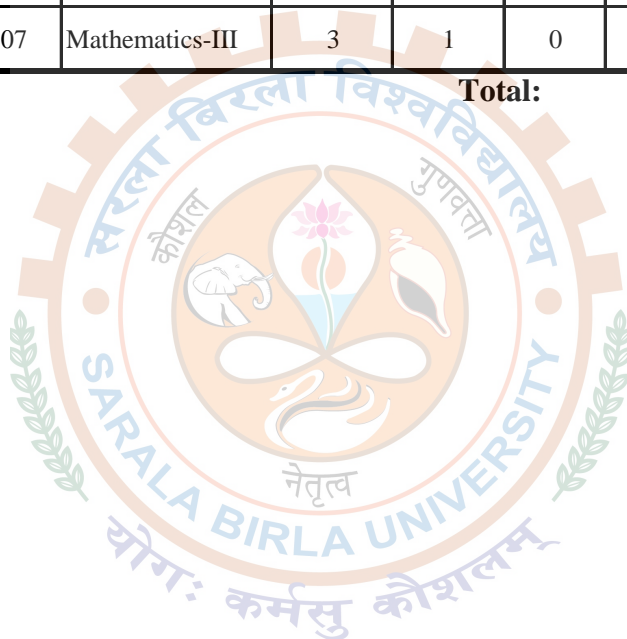
## STRUCTURE OF CIVIL ENGINEERING

Sl. No.	Category	Breakup of Credits
1	Humanities and Social Sciences including Management Courses	14
2	Basic Science Courses	23
3	Engineering Science Courses including workshop, drawing, basics of electrical/mechanical/computer etc	28
4	Professional Core Courses	56
5	Professional Elective Courses relevant to chosen specialization/branch	21
6	Open subjects – Electives from other technical and /or emerging subjects	6
7	Project work, seminar and internship in industry or elsewhere	13
8	Mandatory Courses [Environmental Sciences, Induction Programme, Essence of Indian Traditional Knowledge]	4
<b>Total:</b>		<b>165</b>

## BASIC SCIENCE COURSES

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	BSC-101	Physics	3	1	0	4	I
2	BSC-102	Physics Lab	0	0	3	1.5	I
3	BSC-103	Chemistry	3	1	0	4	II
4	BSC-104	Chemistry Lab	0	0	3	1.5	II
5	BSC-105	Mathematics-I	3	1	0	4	I
6	BSC-106	Mathematics-II	3	1	0	4	II
7	BSC-107	Mathematics-III	3	1	0	4	III

**Total: 23**



## ENGINEERING SCIENCE COURSES

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	ESC-101	Basic Electrical & Electronics Engineering	3	1	0	4	I
2	ESC-102	Basic Electrical & Electronics Engineering Lab	0	0	2	1	I
3	ESC-103	Engineering Graphics & Design	1	0	4	3	I
4	ESC-104	Programming for Problem Solving	3	0	0	3	II
5	ESC-105	Programming for Problem Solving Lab	0	0	4	2	II
6	ESC-106	Workshop/ Manufacturing Practices	1	0	4	3	II
7	ESC-107	Engg. Mechanics	3	1	0	4	III
9	ESC-108	Electronics Devices	3	0	0	3	III
10	ESC-109	Electronics Devices Lab	0	0	2	1	III
11	ESC-110	Digital Electronics	3	0	0	3	IV
12	ESC-111	Digital Electronics Lab	0	0	2	1	IV

**Total**

**28**

## HUMANITIES & SOCIAL SCIENCES INCLUDING MANAGEMENT COURSES

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	HSMC-101	English	3	0	0	3	II
2	HSMC-102	Technical Communication	2	0	0	2	III
3	HSMC-103	Technical Communication Lab	0	0	2	1	III
4	HSMC-104	Organisational Behaviour	2	0	0	2	VII
5	HSMC-105	French Through Communicative Approach-I	2	0	0	2	V
6	HSMC-106	French Through Communicative Approach-II	2	0	0	2	VI
7	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	IV

**Total 14**

## MANDATORY COURSES

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	MC-101	Induction Program	0	0	0	0	I
2	MC-102	Environmental Science	2	0	0	2	IV
3	MC-103	Values & Ethics	2	0	0	2	IV

**Total: 4**

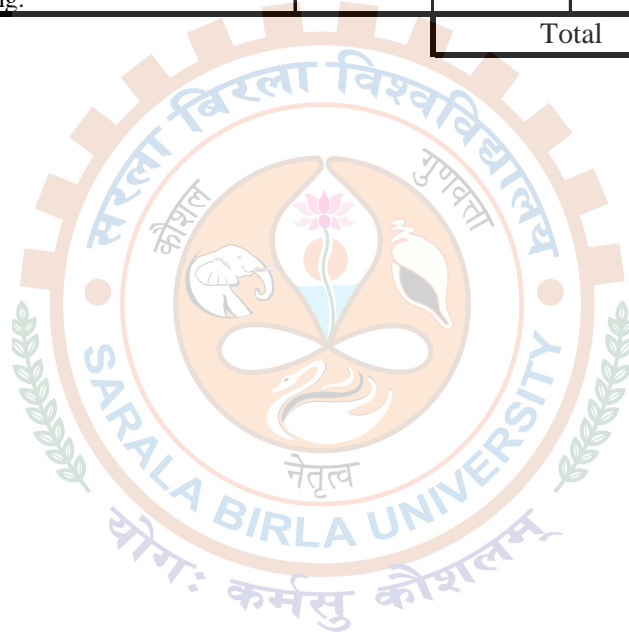


## PROFESSIONAL CORE COURSES

**Branch: Civil Engineering**

Sl. No.	Course Code	Course Title	Hours			Credit	Semester
			L	T	P		
1	PCC-CE-201	Strength Of Material	2	0	0	2	III
2	PCC-CE-202	Strength Of Material Lab	0	0	2	1	III
3	PCC-CE-203	Surveying and Geomatics	1	1	0	2	III
4	PCC-CE-204	Surveying and Geomatics Lab	0	0	2	1	III
5	PCC-CE-205	Disaster Preparedness & Planning	1	1	0	2	IV
6	PCC-CE-206	Engineering Geology	2	0	0	2	IV
8	PCC-CE-207	Introduction to Fluid Mechanics	2	0	0	2	IV
9	PCC-CE-208	Fluid Mechanics Lab	0	0	2	1	IV
10	PCC-CE-209	Materials Testing and Evaluation	1	1	0	2	IV
11	PCC-CE-210	Materials Testing and Evaluation Lab	0	0	2	1	IV
12	PCC-CE-301	Structural Analysis-I	2	1	0	3	V
13	PCC-CE-302	Geotechnical Engineering-I	2	1	0	3	V
14	PCC-CE-303	Geotechnical Engineering Lab-I	0	0	2	1	V
15	PCC-CE-304	Environmental Engineering	2	1	0	3	V
16	PCC-CE-305	Environmental Engineering Lab	0	0	2	1	V
17	PCC-CE-306	Hydraulic Engineering	2	0	0	2	V
18	PCC-CE-307	Hydraulic Engineering Lab	0	0	2	1	V
19	PCC-CE-308	Transportation Engineering	2	0	0	2	V
20	PCC-CE-309	Transportation Engineering Lab	0	0	2	1	V
21	PCC-CE-310	Structural Analysis-II	2	1	0	3	VI
22	PCC-CE-311	Structural Engineering Lab	0	0	2	1	VI
23	PCC-CE-312	Geotechnical Engineering-II	2	1	0	3	VI

24	PCC-CE-313	Geotechnical Engineering Lab-II	0	0	2	1	VI
25	PCC-CE-314	Construction Engineering & Management	2	1	0	3	VI
26	PCC-CE-315	Engineering Economics, Estimation & Costing	2	1	0	3	VI
27	PCC-CE-316	Engineering Economics, Estimation & Costing Lab	0	0	4	2	VI
28	PCC-CE-401	Hydrology & Water Resources Engineering	2	1	0	3	VII
29	PCC-CE-402	Water Resource Engineering Lab	0	0	2	1	VII
30	PCC-CE-403	Concrete Structure Lab	0	0	2	1	VII
31	PCC-CE-404	Computer Aided Civil Engg. Drawing.	1	0	2	2	VIII
Total						56	



# PROFESSIONAL ELECTIVE COURSES

Branch: Civil Engineering

SL No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	PEC-CE-301	Concrete Technology	03:00:00	3	V/VI
2	PEC-CE-302	Instrumentation & Sensor Technologies for Civil Engineering Applications	03:00:00	3	V/VI
3	PEC-CE-303	Design of Concrete Structures-I	03:00:00	3	V/VI
4	PEC-CE-304	Railway Engineering	03:00:00	3	V/VI
5	PEC-CE-305	Open Chanel Flow	03:00:00	3	V/VI
6	PEC-CE-306	Physico-Chemical Processes for Water and Wastewater Treatment	03:00:00	3	V/VI
7	PEC-CE-401	Design of Concrete Structures-II	03:00:00	3	VII/VIII
8	PEC-CE-402	Industrial Structures	03:00:00	3	VII/VIII
9	PEC-CE-403	Design of Steel Structures	03:00:00	3	VII/VIII
10	PEC-CE-404	Structural Analysis-III	03:00:00	3	VII/VIII
11	PEC-CE-405	Foundation Engineering & Geotechnical Design	03:00:00	3	VII/VIII
12	PEC-CE-406	Port and Harbour Engineering	03:00:00	3	VII/VIII
13	PEC-CE-407	Prestressed Concrete	03:00:00	3	VII/VIII
14	PEC-CE-408	Bridge Engineering	03:00:00	3	VII/VIII
15	PEC-CE-409	Advanced Structural Analysis	03:00:00	3	VII/VIII
16	PEC-CE-410	Design of Hydraulic Structure	03:00:00	3	VII/VIII
17	PEC-CE-411	Traffic Engineering and Management	03:00:00	3	VII/VIII

18	PEC-CE-412	Solid and Hazardous Waste Management	03:00:00	3	VII/VIII
19	PEC-CE-413	Earthquake Engineering	03:00:00	3	VII/VIII
20	PEC-CE-414	Structural Dynamics	03:00:00	3	VII/VIII
21	PEC-CE-415	Water and Air Quality Modelling	03:00:00	3	VII/VIII
22	PEC-CE-416	Air and Noise Pollution and Control	03:00:00	3	VII/VIII
23	PEC-CE-417	Irrigation Engineering	03:00:00	3	VII/VIII
24	PEC-CE-418	River Engineering	03:00:00	3	VII/VIII
25	PEC-CE-419	Masonry Structures	03:00:00	3	VII/VIII



## OPEN ELECTIVE COURSES

**Branch: Civil Engineering**

Sl. No.	Course Code	Course Title	Credits
1	OEC-ME-201	Thermodynamics	3
2	OEC-ME-203	Materials Engineering	3
3	OEC-ME-208	Applied Thermodynamics	3
4	OEC-ME-402	Finite Element Analysis	3
5	OEC-ME-406	Principles of Management	3
6	OEC-CSE-311	Computer Graphics	3



# PROJECT

**Branch: Civil Engineering**

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	CE-P1	Project Stage-I	00:00:04	2	VI
2	CE-P2	Project Stage-II	00:00:10	5	VII
3	CE-P3	Project Stage-III	00:00:12	6	VIII

**Total 13**



# COURSE STRUCTURE

## SEMESTER I (FIRST YEAR)

Branch: Civil Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P			IA	ESE
Theory										
1	Basic Science Course	BSC-101	Physics	3	1	0	4	30	70	100
2	Basic Science Course	BSC-105	Mathematics – I	3	1	0	4	30	70	100
3	Engineering Science Course	ESC-101	Basic Electrical & Electronics Engineering	3	1	0	4	30	70	100
Total(A)							12	90	210	300
Practical/Drawing/Design										
1	Engineering Science Course	ESC-103	Engineering Graphics & Design	1	0	4	3	30	20	50
2	Basic Science Course	BSC-102	Physics Lab	0	0	3	1.5	30	20	50
3	Engineering Science Course	ESC-102	Basic Electrical & Electronics Engineering Lab	0	0	2	1	30	20	50
Total(B)							5.5	90	60	150
Grand Total (A+B)							17.5	180	270	450

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

# COURSE STRUCTURE

## SEMESTER II (FIRST YEAR]

Branch: Civil Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P			IA	ESE
Theory										
1	Basic Science Course	BSC-103	Chemistry	3	1	0	4	30	70	100
2	Basic Science Course	BSC-106	Mathematics –II	3	1	0	4	30	70	100
3	Engineering Science Course	ESC-104	Programming for Problem Solving	3	0	0	3	30	70	100
4	Humanities and Social Sciences including Management Courses	HSMC-101	English	3	0	0	3	30	70	100
Total(A)							14	120	280	400
Practical/Drawing/Design										
1	Engineering Science Course	ESC-106	Workshop/ Manufacturing Practices	1	0	4	3	30	20	50
2	Basic Science Course	BSC-104	Chemistry Lab	0	0	3	1.5	30	20	50
3	Engineering Science Course	ESC-105	Programming for Problem Solving Lab	0	0	4	2	30	20	50
Total(B)							5.5	90	60	150
Grand Total (A+B)							20.5	210	340	550

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

# COURSE STRUCTURE

## SEMESTER III (SECOND YEAR)

Branch: Civil Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P			IA	ESE
Theory										
1	Basic Science Course	BSC-107	Mathematics-III	3	1	0	4	30	70	100
2	Engineering Science Courses	ESC-108	Electronic Devices	3	0	0	3	30	70	100
3	Humanities and Social Sciences including Management Courses	HSMC-102	Technical Communication	2	0	0	2	30	70	100
4	Engineering Science Courses	ESC-107	Engineering Mechanics	3	1	0	4	30	70	100
5	Professional Core Courses	PCC-CE-201	Strength Of Material	2	0	0	2	30	70	100
6	Professional Core Courses	PCC-CE-203	Surveying and Geomatics	1	1	0	2	30	70	100
Total(A)							17	180	420	600
Practical/Drawing/Design										
1	Engineering Science Courses	ESC-109	Electronic Devices Lab	0	0	2	1	30	20	50
2	Humanities and Social Sciences including Management	HSMC-103	Technical Communication Lab	0	0	2	1	30	20	50
3	Professional Core Courses	PCC-CE-202	Strength Of Material Lab	0	0	2	1	30	20	50
4	Professional Core Courses	PCC-CE-204	Surveying and Geomatics Lab	0	0	2	1	30	20	50
Total(B)							4	120	80	200
Grand Total (A+B)							21	300	500	800

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

# COURSE STRUCTURE

## SEMESTER IV (SECOND YEAR)

**Branch: Civil Engineering**

B.Tech. CSE Engineering										
Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Engineering Science Courses	ESC-110	Digital Electronics	3	0	0	3	30	70	100
2	Humanities and Social Sciences including	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	30	70	100
3	Mandatory Courses	MC-102	Environmetal Science	2	0	0	2	30	70	100
4	Mandatory Courses	MC-103	Values & Ethics	2	0	0	2	30	70	100
5	Professional Core Courses	PCC-CE-205	Disaster Preparedness & Planning	1	1	0	2	30	70	100
6	Professional Core Courses	PCC-CE-206	Engineering Geology	2	0	0	2	30	70	100
7	Professional Core Courses	PCC-CE-207	Introduction to Fluid Mechanics	2	0	0	2	30	70	100
8	Professional Core Courses	PCC-CE-209	Materials Testing and Evaluation	1	1	0	2	30	70	100
Total(A)							17	240	560	800
Practical/Drawing/Design										
1	Engineering Science Courses	ESC-111	Digital Electronics Lab	0	0	2	1	30	20	50
2	Professional Core Courses	PCC-CE-208	Fluid Mechanics Lab	0	0	2	1	30	20	50
3	Professional Core Courses	PCC-CE-210	Materials Testing and Evaluation Lab	0	0	2	1	30	20	50
Total(B)							3	90	60	150
Grand Total (A+B)							20	330	620	950

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

## SEMESTER V (THIRD YEAR)

**Branch: Civil Engineering**

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Elective Courses		Professional Elective Courses-I	3	0	0	3	30	70	100
2	Professional Core Courses	PCC-CE-301	Structural Analysis -I	2	1	0	3	30	70	100
3	Professional Core Courses	PCC-CE-302	Geotechnical Engineering-I	2	1	0	3	30	70	100
4	Professional Core Courses	PCC-CE-304	Environmental Engineering	2	1	0	3	30	70	100
5	Professional Core Courses	PCC-CE-306	Hydraulic Engineering	2	0	0	2	30	70	100
6	Professional Core Courses	PCC-CE-308	Transportation Engineering	2	0	0	2	30	70	100
7	Humanities and Social Sciences including Management Courses		Foreign Language-I	2	0	0	2	30	70	100
Total(A)							18	210	490	700
Practical/Drawing/Design										
1	Professional Core Courses	PCC-CE-303	Geotechnical Engineering Lab-I	0	0	2	1	30	20	50
2	Professional Core Courses	PCC-CE-305	Environmental Engineering Lab	0	0	2	1	30	20	50
3	Professional Core Courses	PCC-CE-307	Hydraulic Engineering Lab	0	0	2	1	30	20	50
4	Professional Core Courses	PCC-CE-309	Transportation Engineering Lab	0	0	2	1	30	20	50
Total(B)							4	120	80	200
Grand Total (A+B)							22	330	570	900

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

**SEMESTER VI (THIRD YEAR)**

**Branch: Civil Engineering**

Sl. No.	Category	Course Code	Course Title	Hours			Cred it	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Core courses	PCC-CE-310	Structural Analysis -II	2	1	0	3	30	70	100
2	Professional Core courses	PCC-CE-312	Geotechnical Engineering-II	2	1	0	3	30	70	100
3	Professional Core courses	PCC-CE-314	Construction Engineering & Management	2	1	0	3	30	70	100
4	Professional Core courses	PCC-CE-315	Engineering Economics, Estimation & Costing	2	1	0	3	30	70	100
5	Professional Elective courses		Professional Elective-Courses-II	2	1	0	3	30	70	100
6	Humanities and Social Sciences including Management Courses		Foreign Language-II	2	0	0	2	30	70	100
Total(A)							17	240	560	700
Practical/Drawing/Design										
1	Professional Core courses	PCC-CE-311	Structural Engineering Lab	0	0	2	1	30	20	50
2	Professional Core courses	PCC-CE-313	Geotechnical Engineering Lab -II	0	0	2	1	30	20	50
3	Professional Core courses	PCC-CE-316	Engineering Economics, Estimation & Costing	0	0	4	2	30	20	50
4	Project Stage-I	CE-P1	Mini Project/ Workshop	0	0	4	2	75	25	100
Total(B)							6	165	80	250
Grand Total (A+B)							23	405	645	950

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

**SEMESTER VII (FOURTH YEAR]**

**Branch: Civil Engineering**

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P			IA	ESE
Theory										
1	Professional Core courses	PCC-CE-401	Hydrology & Water Resources Engineering	2	1	0	3	30	70	100
2	Professional Elective courses		Professional Elective-Courses-III	2	1	0	3	30	70	100
3	Professional Elective courses		Professional Elective Courses-IV	3	0	0	3	30	70	100
4	Professional Elective courses		Professional Elective Courses-V	2	1	0	3	30	70	100
5	Humanities and Social Sciences including Management Courses	HSMC-104	Organisational Behavior	2	0	0	2	30	70	100
Total(A)							14	150	350	500
Practical/Drawing/Design										
1	Professional Core courses	PCC-CE-402	Water Resource Engineering Lab	0	0	2	1	30	20	50
2	Professional Core courses	PCC-CE-403	Concrete Structure Lab	0	0	2	1	30	20	50
3	Project Stage II	CE-P2	Project Work	0	0	10	5	150	50	200
Total(B)							7	210	90	300
Grand Total (A+B)							21	360	440	800

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

**SEMESTER VIII (FOURTH YEAR]**

**Branch: Civil Engineering**

Sl. No.	Category	Course Code	Course Title	Hours		P	Credit	Marks		
				L	T			IA	ESE	Total
Theory										
1	Professional Elective courses		Professional Elective Courses-VI	2	1	0	3	30	70	100
2	Professional Elective courses		Professional Elective Courses-VII	3	0	0	3	30	70	100
3	Open Elective Courses		Open Elective-I	3	0	0	3	30	70	100
4	Open Elective Courses		Open Elective-II	3	0	0	3	30	70	100
Total(A)							12	120	280	400
Practical/Drawing/Design										
1	Professional Core courses	PCC-CE-404	Computer Aided Civil Engineering Drawing	1	0	2	2	30	20	50
2	Project Stage-III	CE-P3	Project Work & Dissertation	0	0	12	6	300	100	400
Total(B)							8	330	120	450
Grand Total (A+B)							20	450	400	850

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**