

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 UGC & AICTE- CBCS)

Effective from 2018-19

DEFINITION OF CREDIT

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 credits

COURSE CODE AND DEFINITION

Course Code	Definition
BSC	Basic Science courses
ESC	Engineering Science courses
HSMC	Humanities and Social Sciences including Management courses
PCC-CE	Professional core courses
PEC-CE	Professional Elective courses
OEC	Open Elective Courses
MC	Mandatory Courses
CE-P1	Project stage-I
CE-P2	Project stage-II
CE-P3	Project stage-III

Structure of Civil Engineering (B.TECH.)

(Break up of Credits)

S.No	Category	Credit Breakup
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	45
5	Professional Elective courses relevant to chosen specialization/branch	21
6	Open subjects – Electives from other technical and /or emerging subjects	12
7	Mandatory Courses[Environmental Sciences]	4
8	Project work, seminar and internship in industry or elsewhere	16
	Total Credits	163

CREDITS DISTRIBUTION (SEMESTER-WISE AND COURSE-WISE)

Semester	HSMC	BSC	ESC	PCC	PEC	OEC	PROJECT	MC	Total Credit Semester-wise
1st	0	9.5	8	0	0	0	0	0	17.5
2nd	3	9.5	8	0	0	0	0	0	20.5
3rd	3	4	8	6	0	0	0	0	21
4th	2	0	4	10	0	0	0	4	20
5th	2	0	0	15	0	3	0	0	20
6th	4	0	0	6	6	3	2	0	21
7th	0	0	0	8	6	3	5	0	22
8th	0	0	0	0	9	3	9	0	21
Total Credit Course-wise	14	23	28	45	21	12	16	4	163
Total Credit									163

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 Credits:						23	

ENGINEERING SCIENCE COURSES

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	ESC-099	Basic Electrical Engineering	3	1	0	4	I
2	ESC-100	Basic Electrical 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	Engineering 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 COURSE**

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	VI
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 Credits:						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 Credits:						4	

PROFESSIONAL CORE COURSES (Sem III & IV)**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 Management	1	1	0	2	IV
6	PCC-CE-206	Engineering Geology	2	0	0	2	IV
7	PCC-CE-207	Introduction to Fluid Mechanics	2	0	0	2	IV
8	PCC-CE-208	Fluid Mechanics Lab	0	0	2	1	IV
9	PCC-CE-209	Materials Testing and Evaluation	1	1	0	2	IV
10	PCC-CE-210	Materials Testing and Evaluation Lab	0	0	2	1	IV

Total Credit:**16****PROFESSIONAL CORE COURSES (Sem V & VI)**

Sl. No.	Course Code	Course Title	Hours			Credit	Semester
			L	T	P		
1	PCC-CE-301	Structural Analysis-I	2	1	0	3	V
2	PCC-CE-302	Geotechnical Engineering-I	2	0	0	2	V
3	PCC-CE-303	Geotechnical Engineering Lab-I	0	0	2	1	V
4	PCC-CE-304	Environmental Engineering	2	1	0	3	V
5	PCC-CE-305	Hydraulic Engineering	2	0	0	2	V
6	PCC-CE-306	Hydraulic Engineering Lab	0	0	2	1	V
7	PCC-CE-307	Transportation Engineering	2	0	0	2	V
8	PCC-CE-308	Transportation Engineering Lab	0	0	2	1	V
9	PCC-CE-309	Design of Concrete Structures-I	3	0	0	3	VI
10	PCC-CE-310	Engineering Economics, Estimation & Costing	2	1	0	3	VI

Total Credit**21**

PROFESSIONAL CORE COURSES (Sem VII & VIII)

Sl. No.	Course Code	Course Title	Hours			Credit	Semester
			L	T	P		
1	PCC-CE-401	Construction Engineering & Management	2	1	0	3	VII
2	PCC-CE-402	Hydrology & Water Resources Engineering	2	1	0	3	VII
3	PCC-CE-403	Concrete Structure Lab	0	0	2	1	VII
4	PCC-CE-404	Computer Aided Civil Engg. Drawing.	0	0	2	1	VII
Total Credit						8	

PROFESSIONAL ELECTIVE COURSES (Sem V & VI)

Branch: Civil Engineering

SL No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	PEC-CE-301	Structural Analysis -II	02:00:00	2	V/VI
2	PEC-CE-302	Structural Engineering Lab	00:00:02	1	V/VI
3	PEC-CE-303	Geotechnical Engineering-II	02:00:00	2	V/VI
4	PEC-CE-304	Geotechnical Engineering Lab-II	00:00:02	1	V/VI
5	PEC-CE-305	Instrumentation & Sensor Technologies for Civil Engineering Applications	03:00:00	3	V/VI
6	PEC-CE-306	Design of Concrete Structures-I	03:00:00	3	V/VI
7	PEC-CE-307	Railway Engineering	03:00:00	3	V/VI
8	PEC-CE-308	Open Chanel Flow	03:00:00	3	V/VI
9	PEC-CE-309	Physico-Chemical Processes for Water and Wastewater Treatment	03:00:00	3	V/VI

PROFESSIONAL ELECTIVE COURSES (Sem VII & VIII)

Branch: Civil Engineering

1	PEC-CE-401	Design of Concrete Structures-II	03:00:00	3	VII/VIII
2	PEC-CE-402	Industrial Structures	03:00:00	3	VII/VIII
3	PEC-CE-403	Design of Steel Structures	03:00:00	3	VII/VIII
4	PEC-CE-404	Structural Analysis-III	03:00:00	3	VII/VIII
5	PEC-CE-405	Foundation Engineering & Geotechnical Design	03:00:00	3	VII/VIII
6	PEC-CE-406	Port and Harbour Engineering	03:00:00	3	VII/VIII
7	PEC-CE-407	Prestressed Concrete	03:00:00	3	VII/VIII
8	PEC-CE-408	Bridge Engineering	03:00:00	3	VII/VIII
9	PEC-CE-409	Advanced Structural Analysis	03:00:00	3	VII/VIII
10	PEC-CE-410	Design of Hydraulic Structure	03:00:00	3	VII/VIII

11	PEC-CE-411	Traffic Engineering and Management	03:00:00	3	VII/VIII
12	PEC-CE-412	Solid and Hazardous Waste Management	03:00:00	3	VII/VIII
13	PEC-CE-413	Earthquake Engineering	03:00:00	3	VII/VIII
14	PEC-CE-414	Structural Dynamics	03:00:00	3	VII/VIII
15	PEC-CE-415	Water and Air Quality Modelling	03:00:00	3	VII/VIII
16	PEC-CE-416	Air and Noise Pollution and Control	03:00:00	3	VII/VIII
17	PEC-CE-417	Irrigation Engineering	03:00:00	3	VII/VIII
18	PEC-CE-418	River Engineering	03:00:00	3	VII/VIII
19	PEC-CE-419	Masonry Structures	03:00:00	3	VII/VIII
20	PEC-CE-420	Production & Operation Management	03:00:00	3	VII/VIII

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OPEN ELECTIVE COURSES

Branch: Civil Engineering

Sl. No.	Course Code	Course Title	Credits
1	OEC-CSE-303	Artificial Intelligence	3
2	OEC-CSE-305	Machine Learning	3
3	OEC-ME-408	Wind and Solar Energy Systems	3
4	OEC-EEE-412	Operation Research	3
Total Credit:			12

PROJECT

Branch: Civil Engineering

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	CE-P1	Project Stage-I/ Mini Project/ Industrial Training	00:00:04	2	VI
2	CE-P2	Project Stage-II/Minor Project Work	00:00:10	5	VII
3	CE-P3	Project Stage-III/Major Project Work & Dissertation	00:00:18	9	VIII
Total Credit				16	

COURSE STRUCTURE

SEMESTER I (FIRST YEAR]

Branch: Civil Engineering

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
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-099	Basic Electrical 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-100	Basic Electrical 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	Total
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)							6.5	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	Total
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	Professional Core Courses	PCC-CE-201	Strength Of Material	2	0	0	2	30	70	100
5	Engineering Science Courses	ESC-107	Engineering Mechanics	3	1	0	4	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	Professional Core Courses	PCC-CE-202	Strength Of Material Lab	0	0	2	1	30	20	50
3	Professional Core Courses	PCC-CE-204	Surveying and Geomatics Lab	0	0	2	1	30	20	50
4	Humanities and Social Sciences including Management Courses	HSMC-103	Technical Communication 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

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	Professional Core Courses	PCC-CE-205	Disaster Preparedness & Planning Management	1	1	0	2	30	70	100
3	Professional Core Courses	PCC-CE-206	Engineering Geology	2	0	0	2	30	70	100
4	Professional Core Courses	PCC-CE-207	Introduction to Fluid Mechanics	2	0	0	2	30	70	100
5	Professional Core Courses	PCC-CE-209	Materials Testing and Evaluation	1	1	0	2	30	70	100
6	Humanities and Social Sciences including Management Courses	HSMC-107	Professional Practice, Law & Ethics	2	0	0	2	30	70	100
7	Mandatory Courses	MC-102	Environmental Science	2	0	0	2	30	70	100
8	Mandatory Courses	MC-103	Values & Ethics	2	0	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
<p>L-Lecture, T-Tutorial, P-Practical</p> <p>IA- Internal Assessment, ESE-End Semester Examination</p>										

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 Core Courses	PCC-CE-301	Structural Analysis -I	2	1	0	3	30	70	100
2	Professional Core Courses	PCC-CE-302	Geotechnical Engineering-I	2	0	0	2	30	70	100
3	Professional Core Courses	PCC-CE-304	Environmental Engineering	2	1	0	3	30	70	100
4	Professional Core Courses	PCC-CE-305	Hydraulic Engineering	2	0	0	2	30	70	100
5	Professional Core Courses	PCC-CE-307	Transportation Engineering	2	0	0	2	30	70	100
6	Open Elective Courses	OEC-CSE-303	Artificial Intelligence	3	0	0	3	30	70	100
7	Humanities and Social Sciences including Management Courses	HSMC-105	French Through Communicative Approach I	2	0	0	2	30	70	100
Total(A)							17	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-306	Hydraulic Engineering Lab	0	0	2	1	30	20	50
3	Professional Core Courses	PCC-CE-308	Transportation Engineering Lab	0	0	2	1	30	20	50
Total(B)							3	90	60	150
Grand Total (A+B)							20	300	550	850

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			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Elective courses	PEC-CE-301	Professional Elective courses -I/Structural Analysis -II	2	0	0	2	30	70	100
2	Professional Elective courses	PEC-CE-303	Professional Elective courses -II/ Geotechnical Engineering-II	2	0	0	2	30	70	100
3	Professional Core courses	PCC-CE-309	Design of Concrete Structures-I	3	0	0	3	30	70	100
4	Professional Core courses	PCC-CE-310	Engineering Economics, Estimation & Costing	2	1	0	3	30	70	100
5	Open Elective Courses	OEC-CSE-305	Machine Learning	3	0	0	3	30	70	100
6	Humanities and Social Sciences including Management Courses	HSMC-104	Organisational Behavior	2	0	0	2	30	70	100
7	Humanities and Social Sciences including Management Courses	HSMC-106	French Through Communicative Approach-II	2	0	0	2	30	70	100
Total(A)							17	210	490	700
Practical/Drawing/Design										
1	Professional Elective courses	PEC-CE-302	Structural Engineering Lab	0	0	2	1	30	20	50
2	Professional Elective courses	PEC-CE-304	Geotechnical Engineering Lab -II	0	0	2	1	30	20	50
3	Project Stage-I	CE-P1	Project Stage-I/ Mini Project/ Industrial Training	0	0	4	2	75	25	100
Total(B)							4	135	65	200
Grand Total (A+B)							21	345	555	900

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	Total
1	Professional Core courses	PCC-CE-401	Construction Engineering & Management	2	1	0	3	30	70	100
2	Professional Core courses	PCC-CE-402	Hydrology & Water Resources Engineering	2	1	0	3	30	70	100
3	Professional Elective courses	PEC-CE-404	Structural analysis-III	2	1	0	3	30	70	100
4	Professional Elective courses	PEC-CE-401	Design of Concrete Structures-II	2	1	0	3	30	70	100
5	Open Elective Courses	OEC-ME-408	Wind and Solar Energy Systems	3	0	0	3	30	70	100
Total(A)							15	150	350	500

Practical/Drawing/Design

1	Professional Core courses	PCC-CE-403	Concrete Structure Lab	0	0	2	1	30	20	50
2	Professional Core courses	PCC-CE-404	ComputerAided Civil Engineering Drawing	0	0	2	1	30	20	50
3	Project Stage II	CE-P2	Project Stage-II/Minor Project Work	0	0	10	5	75	25	100
Total(B)							7	135	65	200
Grand Total (A+B)							22	285	415	700

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

SEMESTER VIII (FOURTH 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	PEC-CE-413	Earthquake Engineering	3	0	0	3	30	70	100
2	Professional Elective courses	PEC-CE-411	Traffic Engineering and Management	3	0	0	3	30	70	100
3	Professional Elective courses	PEC-CE-408	Bridge Engineering	3	0	0	3	30	70	100
4	Open Elective Courses	OEC-EEE-412	Operation Research	3	0	0	3	30	70	100
Total(A)							12	120	280	400
Practical/Drawing/Design										
1	Project Stage-III	CE-P3	Project Stage-III/Major Project Work & Dissertation	0	0	18	9	75	25	100
Total(B)							9	75	25	100
Grand Total (A+B)							21	195	305	500

L-Lecture, T-Tutorial, P-Practical**ESE-End Semester Examination**