



Tulsiramji Gaikwad-Patil College of Engineering and Technology

Wardha Road, Nagpur-441 108

NAAC A+ Accredited

Approved by AICTE, New Delhi, Govt. of Maharashtra

(An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)



Department of Civil Engineering

DEPARTMENT OF CIVIL ENGINEERING

Structure & Curriculum

From

Academic Year 2022-23

Vision of Institute

To emerge as a learning Center of Excellence in the National Ethos in domains of Science, Technology and Management.

Mission of Institute

- To strive for rearing standard and stature of the students by practicing high standards of professional ethics , transparency and accountability.
- To provide facilities and services to meet the challenges of Industry and Society.
- To facilitate socially responsive research, innovation and entrepreneurship.
- To ascertain holistic development of the students and staff members by inculcating knowledge and profession as work practices.

Vision of the Department

To forge learning Center of Excellence in the field of Civil Engineering

Mission of the Department

- To promote academic and ethical development while upholding high standards.
- To provide advance facilities with the skills needed to face Industry and societal challenges.
- To promote socially responsible research, innovation, and entrepreneurship in the field of Civil Engineering.
- To foster the holistic development of both students and faculty members by inculcating a blend of knowledge and professional work methods for overall progress.

Program Education Objectives (PEO)

Graduates will be able to

- PEO1 : Analyse and design civil engineering structures while keeping social awareness and ethical responsibilities in mind.
- PEO2 : Demonstrate leadership abilities in supporting sustainable practices in Civil Engineering
- PEO3 : Exhibit a commitment to lifelong learning, staying updated on developing technologies and industry trends, and adjusting to the evolving world of Civil Engineering.
- PEO4 : Executing Proficiency in creative problem-solving and innovation, demonstrating an entrepreneurial attitude within the context of Civil Engineering.

Program Outcomes (PO)

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Tulsiramji Gaikwad-Patil College of Engineering & Technology, Nagpur

SCHEME OF INSTRUCTION & SYLLABI

Programme: Civil Engineering

Scheme of Instructions: Second Year B. TECH in Civil Engineering

Semester – III

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME				
									CT-1	CT-2	TA/CA	ESE	TOTAL
1	BSC	BCE2301	Mathematics-III (Transform & Discrete Mathematics)	3	1	-	4	4	15	15	10	60	100
2	ESC	BCE2302	Computer-aided Civil Engineering Drawing	1	1	-	2	2	7	7	6	30	50
3	BSC	BCE2303	Mechanics of Solids	3	1	-	4	4	15	15	10	60	100
4	PCC	BCE2304	Concrete Technology	3	-	-	3	3	15	15	10	60	100
5	PCC	BCE2305	Fluid Mechanics	3	-	-	3	3	15	15	10	60	100
6	ESC	BCE2306	Energy Science & Engineering	2	-	-	2	2	7	7	6	30	50
7	BSC	BCE2307	Mechanics of Solids Lab	-	-	2	2	1	-	-	25	25	50
8	PCC	BCE2308	Concrete Technology Lab	-	-	2	2	1	-	-	25	25	50
9	PCC	BCE2309	Fluid Mechanics Lab	-	-	2	2	1	-	-	25	25	50
10	MCC	BAU2303	Environmental Science	2	-	-	2	Audit	-	-	-	-	-
Total				17	3	6	26	21	74	74	127	375	650

L- Lecture

T-Tutorial

P-Practical

CT1- Class Test 1

TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Eng. Sc.)	PCC (Programme Core Courses)	PEC (Programme Elective Courses)	OEC (Open Elective courses from other discipline)	Project / Seminar / Industrial Training	MCC (Mandatory Courses)
Credits	-	09	04	08	--	--	--	Yes
Cumulative Sum	03	27	18	08	--	--	--	--

PROGRESSIVE TOTAL CREDITS :35+21 =56

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SCHEME OF INSTRUCTION & SYLLABI

Programme: Civil Engineering

Scheme of Instructions: Second Year B. TECH in Civil Engineering

Semester – IV

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME				
									CT-1	CT-2	TA/CA	ESE	TOTAL
1	PCC	BCE2401	Hydrology and Water Resources	3	-	-	3	3	15	15	10	60	100
2	PCC	BCE2402	Surveying	3	-	-	3	3	15	15	10	60	100
3	PCC	BCE2403	Transportation Engineering	3	-	-	3	3	15	15	10	60	100
4	PCC	BCE2404	Structural Analysis	3	1	-	4	4	15	15	10	60	100
5	PCC	BCE2405	Environmental Engineering	3	-	-	3	3	15	15	10	60	100
6	PCC	BCE2406	Surveying Lab	-	-	2	2	1	-	-	25	25	50
7	PCC	BCE2407	Transportation Engineering Lab	-	-	2	2	1	-	-	25	25	50
8	PCC	BCE2408	Structural Analysis Lab	-	-	2	2	1	-	-	25	25	50
9	PCC	BCE2409	Environmental Engineering Lab	-	-	2	2	1	-	-	25	25	50
10	PROJ	BCE2410	Micro Project	-	-	2	2	1	-	-	25	25	50
11	HSMC	BSH2401	Human Values for Professional Society	3	-	-	3	3	15	15	10	60	100
12	MCC	BAU2404	Group Reading of Classics	2	-	-	2	Audit	-	-	-	-	-
Total				20	1	10	31	24	90	90	185	485	850

L- Lecture

T-Tutorial

P-Practical

CT1- Class Test 1

TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses from other discipline)	Project / Seminar / Industrial Training	MCC (Mandatory Courses)
Credits	3	--	--	20	--	--	01	Yes
Cumulative Sum	6	27	18	28	--	--	01	--

PROGRESSIVE TOTAL CREDITS :56+24 =80

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SCHEME OF INSTRUCTION & SYLLABI

Programme: Civil Engineering

Scheme of Instructions: Third Year B. TECH in Civil Engineering

Semester – V

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs./Wk	Credits	EXAM SCHEME				
									CT1	CT2	TA/CA	ESE	TOTAL
1	PCC	BCE3501	Reinforced Cement Concrete Structures	3	-	-	3	3	15	15	10	60	100
2	PCC	BCE3502	Advanced Structural Analysis	3	1	-	4	4	15	15	10	60	100
3	PCC	BCE3503	Advanced Surveying	3	-	-	3	3	15	15	10	60	100
4	PEC	BCE3504-07	Program Elective-I	3	-	-	3	3	15	15	10	60	100
5	PEC	BCE3508-11	Program Elective-II	3	-	-	3	3	15	15	10	60	100
6	OEC	BCEXX01-14	Open Elective-I	3	-	-	3	3	15	15	10	60	100
7	PCC	BCE3516	Reinforced Cement Concrete Structures Lab	-	-	2	2	1	-	-	25	25	50
8	PCC	BCE3517	Advanced Structural Analysis Lab	-	-	2	2	1	-	-	25	25	50
9	PCC	BCE3518	Advanced Surveying Lab	-	-	2	2	1	-	-	25	25	50
10	PROJ	BCE3519	Micro Project	-	-	2	2	1	-	-	25	25	50
11	MCC	BAU3505	Heritage	2	-	-	2	Audit	-	-	-	-	-
Total				20	1	8	29	23	90	90	160	460	800

L- Lecture

T-Tutorial

P-Practical

CT1- Class Test 1

TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses from other discipline)	Project / Seminar / Industrial Training	MCC (Mandatory Courses)
Credits	--	--	-	13	06	03	01	Yes
Cumulative Sum	06	27	18	41	06	03	02	--

PROGRESSIVE TOTAL CREDITS :80+23 =103

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SCHEME OF INSTRUCTION & SYLLABI

Programme: Civil Engineering

Scheme of Instructions: Third Year B. TECH in Civil Engineering

Semester – VI

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs./Wk	Credits	EXAM SCHEME				
									CT1	CT2	TA/CA	ESE	TOTAL
1	PCC	BCE3601	Advanced Fluid Mechanics	3	-	-	3	3	15	15	10	60	100
2	PCC	BCE3602	Design of Steel Structures	3	-	-	3	3	15	15	10	60	100
3	PCC	BCE3603	Geotechnical Engineering	3	-	-	3	3	15	15	10	60	100
4	PEC	BCE3604-07	Program Elective-III	3	-	-	3	3	15	15	10	60	100
5	PEC	BCE3608-11	Program Elective-IV	3	-	-	3	3	15	15	10	60	100
6	OEC	BCEXX01-14	Open Elective -II	3	-	-	3	3	15	15	10	60	100
7	PCC	BCE3616	Geotechnical Engineering Lab	-	-	2	2	1	-	-	25	25	50
8	PCC	BCE3617	Steel Structures Lab	-	-	2	2	1	-	-	25	25	50
9	PCC	BCE3618	Advanced Fluid Mechanics Lab	-	-	2	2	1	-	-	25	25	50
10	PROJ	BCE3619	Mini Project#	-	-	2	2	1+1#	-	-	25	25	50
11	MCC	BAU3606	Social Awareness	2	-	-	2	Audit	-	-	-	-	-
Total				20	-	8	28	23	90	90	160	460	800

Every Student will undergo Industrial Training/Internship of Two weeks in summer vacation after B. TECH VI Sem. Examinations, upon successful completion of industrial training/internship 01 credit will be awarded after submission of the report in prescribed format.

L- Lecture

T-Tutorial

P-Practical

CT1- Class Test 1

TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses from other discipline)	Project / Seminar / Industrial Training	MCC (Mandatory Courses)
Credits	--	--	--	12	06	03	02	Yes
Cumulative Sum	06	27	18	53	12	06	04	--

PROGRESSIVE TOTAL CREDITS: 103+ 23 = 126

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SCHEME OF INSTRUCTION & SYLLABI

Programme: Civil Engineering

Scheme of Instructions: Final Year B. TECH in Civil Engineering

Semester – VII (Group-A)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs./Wk	Credits	EXAM SCHEME				
									CT1	CT2	TA/CA	ESE	TOTAL
1	PCC	BCE4701	Estimating & Costing	3	1	-	4	4	15	15	10	60	100
2	PCC	BCE4702	Advanced Design of Reinforced Concrete Structure.	3	1	-	4	4	15	15	10	60	100
3	PEC	BCE4703-06	Program Elective-V	3	-	-	3	3	15	15	10	60	100
4	PEC	BCE4707-10	Program Elective-VI	3	-	-	3	3	15	15	10	60	100
5	OEC	B\$\$\$XX01-14	Open Elective-III	3	-	-	3	3	15	15	10	60	100
6	PEC	BCE4715-18	Program Elective-VII	3	-	-	3	3	15	15	10	60	100
7	PCC	BCE4719	Estimating & Costing Lab	-	-	2	2	1	-	-	25	25	50
8	PCC	BCE4720	Advanced Concrete Structure Lab	-	-	2	2	1	-	-	25	25	50
9	PROJ	BCE4721	Seminar based on Emerging Courses*	-	-	2	2	2	-	-	25	25	50
10	MCC	BAU4707	Behavioral and Interpersonal Skills	2	-	-	2	Audit	-	-	-	-	-
Total				20	2	6	28	24	90	90	135	435	750

*There will be two presentations, based on seminar topic to be selected in consultation with a guide preferably based on emerging trends.

L- Lecture

CT1- Class Test 1

CT2- Class Test 2

T-Tutorial

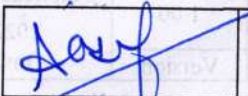
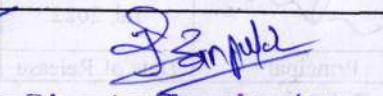


P-Practical

TA/CA- Teacher Assessment/Continuous Assessment

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses from other discipline)	Project / Seminar / Industrial Training	MCC (Mandatory Courses)
Credits	--	--	--	10	09	03	02	Yes
Cumulative Sum	06	27	18	63	21	09	06	--

PROGRESSIVE TOTAL CREDITS :126+24 = 150

				Jul, 2022	1.00	Applicable for AY 2022-23 Onwards
Chairperson H.O.D.	Vice Principal/ Director Academics Tulsiramji Gaikwad-Patil	Director Administration	Principal	Date of Release	Version	

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SCHEME OF INSTRUCTION & SYLLABI

Programme: Civil Engineering

Scheme of Instructions: Final Year B. TECH in Civil Engineering

Semester – VIII (Group-A)

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs./Wk	Credits	EXAM SCHEME				
									CT1	CT2	TA/CA	ESE	TOTAL
1	PROJ	BCE4801	Project	-	-	16	16	8	-	-	50	50	100
2	PCC	BCE4802	Comprehensive Viva-voce	-	-	-	-	3	-	-	-	100	100
3	HSMC	BCE4803	Extra-Curricular Activities / Competitive Exam	-	-	-	-	2	-	-	100	-	100
4	PCC	BCE4804	Sustainable Development Goals	2	-	-	2	2	-	-	20	30	50
5	MCC	BAU4808	Project based Science, Technology, Social, Design and Innovation	2	-	-	2	Audit	-	-	-	-	-
Total				4	-	16	20	15	-	-	170	180	350

L- Lecture

CT1- Class Test 1

CT2- Class Test 2

T-Tutorial

TA/CA- Teacher Assessment/Continuous Assessment

ESE- End Semester Examination (For Laboratory End Semester performance)

P-Practical

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses from other discipline)	Project / Seminar / Industrial Training	MCC (Mandatory Courses)
Credits	02	--	--	05	--	--	08	Yes
Cumulative Sum	08	27	18	68	21	09	14	--

PROGRESSIVE TOTAL CREDITS :150+15 = 165

				Jul, 2022	1.00	Applicable for AY 2022-23 Onwards
Chairperson	Vice Principal/ Director Academics	Director Administration	Principal	Date of Release	Version	

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Principal
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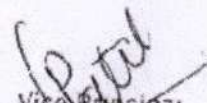
Program: Civil Engineering
List of Electives offered by Civil Engineering Department

Program Elective- I	Program Elective- II	Program Elective- III	Program Elective- IV
Semester V Environmental Engineering	Semester V Hydrology & Water Resources Engineering	Semester VI Hydraulics	Semester VI Construction Engineering & Management
BCE3504 -Rural Water Supply and Sanitation	BCE3508 -Water Resources Engineering	BCE3604 -Design of hydraulic structures	BCE3608 -Building Construction Practice
BCE3505 -Environmental Laws and Policy	BCE3509 -Water Quality Engineering	BCE3605 -Hydraulic modelling	BCE3609 - Advanced Building Construction Methods
BCE3506 -Solid and Hazardous Waste Management	BCE3510 -Surface Hydrology	BCE3606 -Urban Hydrology and Hydraulics	BCE3610 -Structural Audit & Retrofitting of Structures
BCE3507 -Air and Noise Pollution Control	BCE3511 -Flood Control & Drainage Engineering	BCE3607 -River Engineering	BCE3611 -Construction Equipment & Automation

Program Elective- V	Program Elective- VI	Program Elective- VII	Open Elective- I	Open Elective- II
Semester VII Transportation Engineering	Semester VII Structural Engineering	Semester VII Geotechnical Engineering	Semester V	Semester VI
BCE4703 -Pavement Design	BCE4707 -High Rise Structures	BCE4715 -Foundation Engineering	BCEXX07 -Introduction to art and Aesthetics	BCEXX08 -Metro Systems & Engineering
BCE4704 -Urban Transportation Planning	BCE4708 - Industrial Structures	BCE4716 -Geotechnical Design		
BCE4705 -Airport Planning and Design	BCE4709 -Prestressed Concrete	BCE4717 -Structural Geology		
BCE4706 -High Speed Rail Engineering	BCE4710 -Earthquake Engineering	BCE4718 -Rock Mechanics		


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