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Late Sau. Kantabai Bhavarlalji Jain

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Shri Neminath Jain Brahmacharyashram (SNJB) (Jain Gurukul)

Neminagar, Chandwad - 423101, Dist. Nashik (MS, India).

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ESTD - 1928

Curriculum Structure and Evaluation Scheme for B. Tech.

in Civil Engineering with Multidisciplinary Minor

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To be implemented for 2024-28 Batch
(With Effect from Academic Year 2024-25)

Vision of the Institute

Transform young aspirant learners towards creativity and professionalism for societal growth through quality technical education.

Mission of the Institute

1. To transfer the suitable technology, particularly for rural development.
2. To enhance diverse career opportunities among students for building a nation.
3. To acquire the environment of learning to bridge the gap between industry and academics.
4. To share values, ideas, beliefs by encouraging faculties and students for welfare of society.

The vision of the Civil Engineering Department

To empower students to get knowledge and excellence in civil engineering and to cultivate a sense of commitment to society.

Mission of the Civil Engineering Department

1. To develop outstanding Civil Engineering graduates with Highest ethics.
2. To provide advanced skills of learning which helps to travel the journey from academics to industry.
3. To impart basic knowledge to serve the society.

Program Outcomes (POs) for an engineering graduate:

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 public health and safety, and 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 for complex problems.
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.

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6. **The Engineer and Society:** Apply reasoning informed by 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 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 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 lifelong learning in the broadest context of technological change.

Program Specific Outcomes
1. To offer engineering services with professional and ethical responsibility.
2. To demonstrate knowledge in analysis, design, laboratory investigation with high proficiency in mathematics,science.
3. Interact with stakeholders effectively and execute quality construction work applying necessary tools.

Abbreviations:

Table 1: Abbreviations

Abbreviation	Meaning
CIE	Continuous Internal Evaluation
MSE	Mid Semester Examination
SEE	Semester End Examination
BSC	Basic Science Courses
ESC	Engineering Science Courses
VSEC/VSC	Vocational and Skill Enhancement Courses
VEC	Value Education Courses
AEC	Ability Enhancement Courses
PCC	Program Core Courses

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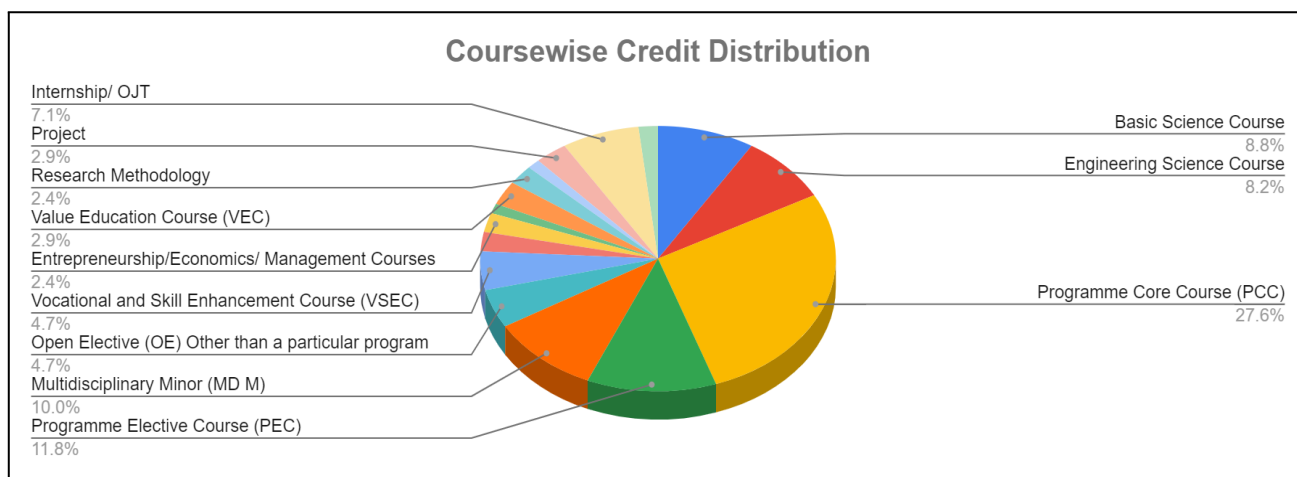LSKBJ COLLEGE OF ENGINEERING
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Abbreviation	Meaning
PEC	Program Elective Courses
MDM	Multidisciplinary Minor
OE/OEC	Open Elective - other than a particular program
EEM	Entrepreneurship/Economics/ Management Courses (HSSM)
ELC	Research Methodology
	Computer Engineering Project (CEP)/ Field Project (FP)
	Project
	Internship/ On Job Training (OJT)
IKS	Indian Knowledge System
CC/CCC	Co-Curricular Courses
HOC	Honor Courses
EXT	Exit Courses
DMC	Double Minor Courses
HRC	Honor with Research Courses
AC	Audit Courses
SIP	Student Induction Program
L	Lecture
T	Tutorial
P/PR	Practical
TH	Theory
Lab	Laboratory
TW	Term Work
OR	Oral
CE	Civil Engineering
CS	Computer Engineering
ME	Mechanical Engineering
AD	Artificial Intelligence and Data Science Engineering
ET	Electronics and Telecommunication Engineering

GENERAL COURSE STRUCTURE

A. Definition of Credit:

Table 2: Credit Definition

1 Hour Lecture (L) per week	1 Credit
1 Hour Tutorial (T) per week	1 Credit
2 Hours Practical (P) per week	1 Credit

B. Range of Credits: (B.Tech. or Equivalent) in Tech. with Multidisciplinary Minor: In the light of the fact that a typical NEP Compliant Model Four-year Undergraduate degree program in Technology has about 176 credits, the total number of credits proposed for the four-year B.Tech. in **Civil Engineering** with Multidisciplinary minor degree is kept as **170.**

Table 3: Range of Credits

Course Category		Credits As PER NEP Guidelines	Proposed Credits
Basic Science Course	BSC/ESC	14-18	15
Engineering Science Course		16-12	14
Programme Core Course (PCC)	Program Courses	44-56	47
Programme Elective Course (PEC)		20	20
Multidisciplinary Minor (MD M)	Multidisciplinary Courses	14	17
Open Elective (OE) Other than a particular program		8	8
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	8	8
Ability Enhancement Course (AEC)	Humanities Social Science and Management (HSSM)	4	4
Entrepreneurship/Economics/ Management Courses		2	4
Indian Knowledge System (IKS)		2	2
Value Education Course (VEC)		4	5
Research Methodology(RM)	Experiential Learning Courses	4	4
Community Engagement Project (CEP)/ Field Project (FP)		2	2
Project		4	5
Internship/ OJT		12	12
Co-curricular Courses (CC)	Liberal Learning Courses	4	3
Total Credits		**160-176**	**170**

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C. Semester wise Credit Distribution Structure for Four Year B. Tech in Civil Engineering with Multidisciplinary Minor:

Table 4: Semester-wise Credit Distribution Structure

Semester		I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC/ESC	8	7	-	-	-	-	-	-	15
Engineering Science Course		7	7	-	-	-	-	-	-	14
Programme Core Course (PCC)	Program Courses	-	3	11	8	9	4	9	3	47
Programme Elective Course (PEC)		-	-	-	-	6	5	6	3	20
Multidisciplinary Minor (MD M)	Multidisciplinary Courses	-	-	3	3	3	2	3	3	17
Open Elective (OE) Other than a particular program		-	-	-	3	3	2	-	-	8
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	2	2	-	2	-	2	-	-	8
Ability Enhancement Course (AEC)	Humanities Social Science and Management (HSSM)	1	-	1	2	-	-	-	-	4
Entrepreneurship/Economics/ Management Courses		-	-	2	2	-	-	-	-	4
Indian Knowledge System (IKS)		2	-	-	-	-	-	-	-	2
Value Education Course (VEC)		-	-	3	2	-	-	-	-	5
Research Methodology	Experiential Learning Courses	-	-	-	-	-	4	-	-	4
Community Engagement Project (CEP)/ Field Project (FP)		-	-	2	-	-	-	-	-	2
Project		-	-	-	-	-	2	3	-	5
Internship / OJT		-	-	-	-	-	-	-	12	12
Co-curricular Courses (CC)	Liberal Learning Courses	1	2	-	-	-	-	-	-	3
Total Credits (Major)		**21**	**21**	**22**	**22**	**21**	**21**	**21**	**21**	**170**

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Coursewise Credit Distribution

- Internship/ OJT 7.1%
- Project 2.9%
- Research Methodology 2.4%
- Value Education Course (VEC) 2.9%
- Entrepreneurship/Economics/ Management Courses 2.4%
- Vocational and Skill Enhancement Course (VSEC) 4.7%
- Open Elective (OE) Other than a particular program 4.7%
- Multidisciplinary Minor (MD M) 10.0%
- Programme Elective Course (PEC) 11.8%
- Basic Science Course 8.8%
- Engineering Science Course 8.2%
- Programme Core Course (PCC) 27.6%

Students can opt for any of the following as per the rules and regulations given by institute:

1. B. Tech with Multidisciplinary Minor = Total 170 Credits
2. B. Tech with Multidisciplinary Minor and Honor = Total 188 Credits
3. B. Tech with Multidisciplinary Minor and Honor by Research = Total 188 Credits
4. B. Tech with Multidisciplinary Minors (Double Minor) = Total 188 Credits

Students will have the flexibility to enter a program in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs. Students exiting will be awarded provided they secure additional EIGHT credits in skill-based vocational courses.

The credit structure for different levels under the Four-year Bachelor's Multidisciplinary B. Tech Programme with multiple entry and multiple exit options are as given below:

Table 5: Credit Requirements

Level	Qualification Title	Credit Requirements	Semester	Year
4.5	One Year UG Certificate in Tech.	42	2	1
5.0	Two Years UG Diploma in Tech.	86	4	2
5.5	Three Years Bachelor's Degree in Vocation (B. Voc.) or B. Sc. (Tech.)	128	6	3
6.0	4-Years Bachelor's degree (B.Tech. or Equivalent) in Tech. with Multidisciplinary Minor	170	8	4

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D. Category-wise Courses

1. MULTIDISCIPLINARY MINOR (MD M)

- List of Multidisciplinary Minor Courses from other departments: Total 17 Credits
- The Minor courses may be from the different disciplines of the Engineering faculty, or they can be from different faculty altogether.
- Students have to choose the MD M in the Second Year AND once opted then students can not change it throughout the semesters.

Table 6: Multidisciplinary Minors

Offered By Department	Sr. No.	Course Code	Course Name	Semester
Artificial Intelligence and Data Science	1	24-MDM-AD-2-01	Artificial Intelligence	III
		24-MDM-AD-2-02	Artificial Intelligence Lab	
	2	24-MDM-AD-2-03	Artificial Neural Network	IV
	3	24-MDM-AD-3-01	Machine Learning	V
		24-MDM-AD-3-02	Machine Learning Lab	
	4	24-MDM-AD-3-03	Deep Learning	VI
	5	24-MDM-AD-4-01	Generative AI	VII
		24-MDM-AD-4-02	Generative AI Lab	
	6	24-MDM-AD-4-03	Reinforcement Learning	VIII
Civil Engineering	1	24-MDM-CE-2-01	Construction Materials, Quality and Safety in Construction	III
		24-MDM-CE-2-02	Construction Materials, Quality and Safety in Construction Lab	
	2	24-MDM-CE-2-03	Management Techniques for Urban Systems	IV
	3	24-MDM-CE-3-01	Concrete Technology	V
		24-MDM-CE-3-02	Concrete Technology Lab	
	4	24-MDM-CE-3-03	Construction Planning & Management	VI
	5	24-MDM-CE-4-01	Building cost estimation and valuation	VII
		24-MDM-CE-4-02	Building cost estimation and valuation Lab	
	6	24-MDM-CE-4-03	Construction Contracts,Construction Costing and Financial Management	VIII
Computer Engineering	1	24-MDM-CS-2-01	Data Structure	III
		24-MDM-CS-2-02	Data Structure Lab	
	2	24-MDM-CS-2-03	Database Management System	IV
	3	24-MDM-CS-3-01	Object Oriented Programming in Java	V

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Offered By Department	Sr. No.	Course Code	Course Name	Semester
		24-MDM-CS-3-02	Java Programming Lab	
	4	24-MDM-CS-3-03	Cloud Computing	VI
	5	24-MDM-CS-4-01	Data Science and Machine Learning	VII
		24-MDM-CS-4-02	Data Science and Machine Learning Lab	
	6	24-MDM-CS-4-03	Blockchain Technologies	VIII
Electronics & Telecommunication Engineering	1	24-MDM-ET-2-01	Internet of Things	III
		24-MDM-ET-2-02	Internet of Things Laboratory	
	2	24-MDM-ET-2-03	Digital Electronics and Microprocessor	IV
	3	24-MDM-ET-3-01	Drone Technology	V
		24-MDM-ET-3-02	Drone Technology Laboratory	
	4	24-MDM-ET-3-03	Robotics	VI
	5	24-MDM-ET-4-01	Mobile Computing	VII
		24-MDM-ET-4-02	Mobile Computing Laboratory	
	6	24-MDM-ET-4-03	Wireless Sensor Networks	VIII
Mechanical Engineering	1	24-MDM-ME-2-01	e-Vehicle Technology	III
	2	24-MDM-ME-2-02	EV Power Systems and Battery Technology	IV
	3	24-MDM-ME-3-01	Electric Drive Train and Propulsion Systems	V
		24-MDM-ME-3-02	Electric Vehicle Lab-I	
	4	24-MDM-ME-3-03	EV Charging Infrastructure	VI
	5	24-MDM-ME-4-01	Vehicle Dynamics and Control in EVs	VII
		24-MDM-ME-4-02	Electric Vehicle Lab-II	
	6	24-MDM-ME-4-03	e-Mobility: Sustainability and the Future	VIII

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2. THE FOLLOWING COURSES ARE OFFERED AS OPEN ELECTIVES

- A student can opt for any one course out of available institute-wide courses defined in the following list as Open Elective – provided he/she has not taken that particular course in his/her Programme core, Programme elective, Multidisciplinary Minor, other Open elective, and Vocational and Skill Enhancement courses, etc. throughout his/her four years of B. Tech Programme.
- The student must opt for a course that is compulsory from another discipline/branch, not from the same Major discipline/branch and also the course must be not related to his/her major degree/branch courses.
- For Open Electives (OE) 8 credits are offered from semester IV to semester VI.
- Two courses of 3 credits and one course of 2 credits.

Table 7: Open Electives

Sr. No	Course Code	Course Name
Open Elective I (SEM-IV)		
1	24-OEC-2-4-01	Precision Agriculture
2	24-OEC-2-4-02	Soil and Water Conservation for Agriculture
3	24-OEC-2-4-03	Business Development, Marketing and Finance
4	24-OEC-2-4-04	Financial Accounting and Management
5	24-OEC-2-4-05	Information Technology Laws and Policies
Open Elective II (SEM-V)		
1	24-OEC-3-5-01	Agronics
2	24-OEC-3-5-02	Digital Marketing
3	24-OEC-3-5-03	Estimation and Costing
4	24-OEC-3-5-04	Sustainable Energy Engineering
5	24-OEC-3-5-05	Occupational Health and Safety
Open Elective III (SEM-VI)		
1	24-OEC-3-6-01	E-Governance in Agriculture
2	24-OEC-3-6-02	Agro Entrepreneurship
3	24-OEC-3-6-03	Start-up and new Venture Development
4	24-OEC-3-6-04	Rural Finance Management and Budgeting
5	24-OEC-3-6-05	Green Energy

3. HONORS

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- In addition to 170 credits of B. Tech Programmes (Bachelor of Technology) i.e. Major in which the student has taken admission, a student may opt for Honors in the same Tech. discipline/branch / Emerging Areas.
- A student is required to study an additional 18 credits in the same Tech. discipline/ branch / Emerging Areas for Honors distributed over semesters III to VIII.
- The total number of credits required to complete the Honors in the same Tech. discipline/ Emerging Areas is 18 credits, in addition to 170 credits in Major.
- Students will have to compulsorily choose Honors from the same Tech. discipline/branch.
- Honors Degree in the Bachelor of Engineering programme shall be awarded to students earning additional total credits of all six semesters from the second year to final year, i.e., 18 Credits, in addition to 170 credits or 128 credits respectively. The student admitted in the first year must earn 170 credits and 128 credits admitted in lateral entry (admitted after Diploma or B.Sc.) in the second year.

The student has to choose One Honor out of the Two Honor groups provided below

Honors offered by Civil Engineering Department are as follows.

Table 8: Honors Courses

Sr No	Name of Honors Offered by Department
A.	Construction Management
B.	Sustainability Engineering

The detailed syllabus structure for the same is as follows.

Specialization Honors in Construction Management
Table 8 A : Honors Courses (A)

Sr. No	Category	SEM	Course Code	Course Name	Teaching Scheme				Credits
					Hours				
					L	T	P	Total Hours	
01	HOC	III	24-HOC-CE-2-01A	Project Planning and Control	3	-	-	3	3
02	HOC	IV	24-HOC-CE-2-02A	Principal of Construction Management	3	-	-	3	3
03	HOC	V	24-HOC-CE-3-03A	Admixtures and Special Concretes	3	-	-	3	3
04	HOC	VI	24-HOC-CE-3-04A	Sustainable Engineering Concepts and life Cycle Analysis	3	-	-	3	3
05	HOC	VII	24-HOC-CE-4-05A	Safety in Construction	3	-	-	3	3
06	HOC	VIII	24-HOC-CE-4-06A	Bridge Engineering	3	-	-	3	3
Total					18	-	-	18	18

Specialization Honors in Sustainability Engineering

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Table 8 B : Honors Courses (B)

Sr. No	Category	SEM	Course Code	Course Name	Teaching Scheme				
					Hours				Credits
					L	T	P	Total Hours	
01	HOC	III	24-HOC-CE-2-01B	Environmental legislation in India	3	-	-	3	3
02	HOC	IV	24-HOC-CE-2-02B	Sustainable Construction Materials	3	-	-	3	3
03	HOC	V	24-HOC-CE-3-03B	Smart Cities and Smart Villages	3	-	-	3	3
04	HOC	VI	24-HOC-CE-3-04B	Flood Mitigation and Hazard Management	3	-	-	3	3
05	HOC	VII	24-HOC-CE-4-05B	Green Buildings	3	-	-	3	3
06	HOC	VIII	24-HOC-CE-4-06B	Environment Sustainability and Climate Change	3	-	-	3	3
Total					18	-	-	18	18

4. **DOUBLE MINORS (MULTIDISCIPLINARY AND SPECIALIZATION MINORS) OFFERED BY CIVIL ENGINEERING DEPARTMENT FOR STUDENTS OF OTHER BRANCH OF ENGINEERING**

- In addition to 170 credits of B. Tech Programmes (Bachelor of Technology) i.e. Major in which the student has taken admission, a student may opt for Specialization Minor in another discipline/branch/emerging areas, not in Major discipline/branch.
- A student is required to study an additional 18 credits in another discipline/branch/emerging areas for Specialization Minor distributed over semesters III to VIII.
- The total number of credits required to complete the Specialization Minor in another discipline/ Emerging Areas is 18 credits, in addition to 170 credits in Major.

Table 9 : Double Minors

Name of Department	Double Minor Basket Name	Sr No	Course Code	Course Name	Semester
Artificial Intelligence & Data Science Engineering	High Performance Computing	1	24-DMC-AD-2-01	Advance Computer Network	III
		2	24-DMC-AD-2-02	Cloud Computing	IV
		3	24-DMC-AD-3-03	Distributed Computing	V
		4	24-DMC-AD-3-04	Blockchain Technology	VI
		5	24-DMC-AD-4-05	High Performance Computing	VII
		6	24-DMC-AD-4-06	Mastering in Cloud Architecture	VIII

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Name of Department	Double Minor Basket Name	Sr No	Course Code	Course Name	Semester
Civil Engineering	Infrastructure Engineering	1	24-DMC-CE-2-01	Infrastructure Planning and Management	III
		2	24-DMC-CE-2-02	Infrastructure Economics	IV
		3	24-DMC-CE-3-03	Project Formulation and Appraisal	V
		4	24-DMC-CE-3-04	Advanced and Sustainable Materials in Infrastructure	VI
		5	24-DMC-CE-4-05	Management Information Systems	VII
		6	24-DMC-CE-4-06	Computational Methods in Infrastructure Engineering	VIII
Computer Engineering	Data Science	1	24-DMC-CS-2-01	Foundation of Data Science	III
		2	24-DMC-CS-2-02	Principles of Artificial Intelligence and Machine Learning	IV
		3	24-DMC-CS-3-03	Computational Data analytics	V
		4	24-DMC-CS-3-04	Python for Data Science	VI
		5	24-DMC-CS-4-05	Data Mining and Warehousing	VII
		6	24-DMC-CS-4-06	Business Intelligence & Analytics	VIII
Electronics & Telecommunication Engineering	Embedded System	1	24-DMC-ET-2-01	Digital Electronics	III
		2	24-DMC-ET-2-02	Microcontrollers	IV
		3	24-DMC-ET-3-03	Sensors & Actuators	V
		4	24-DMC-ET-3-04	Mechatronics	VI
		5	24-DMC-ET-4-05	Embedded System	VII
		6	24-DMC-ET-4-06	Internet of Things	VIII
Mechanical Engineering	3D Printing	1	24-DMC-ME-2-01	Additive Manufacturing	III
		2	24-DMC-ME-2-02	3D Printers & Scanners	IV
		3	24-DMC-ME-3-03	Materials for 3D Printing	V
		4	24-DMC-ME-3-04	Design for Additive Manufacturing	VI
		5	24-DMC-ME-4-05	Biofabrication and 3D Bioprinting	VII
		6	24-DMC-ME-4-06	3D Printing Applications & Future	VIII

5. HONORS WITH RESEARCH AND MULTIDISCIPLINARY MINOR

- The Student will work on a Research Project or Dissertation for 18 Credits in the Fourth Year in the respective discipline.
- The distribution of 18 Credits for Research projects in Sem-VII and Sem-VIII is given below.
- To get a B. Tech in Civil Engineering-Honors with Research and Multidisciplinary Minor degree Students need to earn a total of 188 Credits which consist of 170 credits of regular

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Multidisciplinary Minor courses, 18 Credits of Honor courses, 18 credits of Research courses.

Table 10: Honors with Research and Multidisciplinary Minor (Sem-VII)

Course Code	Course Name	Teaching Scheme				Evaluation Scheme							Total Marks
		Hours			Credit	Theory Course				Lab Course			
		L	T	P	Total	CIE	MSE	SEE	TH Marks	TW	PR	OR	
24-HRC-4-01	Intellectual Property Right (IPR)	2	-	-	2	-	50	50	100	-	-	-	100
24-HRC-4-02	Research Project (Synopsis) Phase-I	-	-	4	2	-	-	-	-	50	50	-	100
24-HRC-4-03	Research Specific Core Course-I (Online NPTEL Course)*	3	-	-	3	-	50	50	100	-	-	-	100
Total		**5**	**-**	**4**	**7**	**-**	**100**	**100**	**200**	**50**	**50**	**-**	**300**

Online NPTEL Courses can be offered as per availability on portals like NPTEL/SWAYAM.

Table 11 : Honors with Research and Multidisciplinary Minor (Sem-VIII)

Course Code	Course Name	Teaching Scheme				Evaluation Scheme							Total Marks
		Hours			Credit	Theory Course				Lab Course			
		L	T	P	Total	CIE	MSE	SEE	TH Marks	TW	PR	OR	
24-HRC-4-04	Research Project Phase-II	-	-	22	11	-	-	-	-	50	50	-	100
Total		**-**	**-**	**22**	**11**	**-**	**-**	**-**	**-**	**50**	**50**	**-**	**100**

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TEACHING AND EVALUATION SCHEME FOR FIRST YEAR B-TECH
Semester – I

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme								
				Hours				Credits	Theory Course				Lab Course			Total Marks
				L	T	P	Total Hours		CIE	MSE	SEE	TH Marks	TW	PR	OR	
1	BSC	24-BSC-1-02	Engineering Chemistry	3	-	-	3	3	20	20	60	100	-	-	-	100
2	BSC	24-BSC-1-03	Linear Algebra And Differential Calculus	3	1	-	4	4	20	20	60	100	-	-	-	100
3	ESC	24-ESC-1-03	Engineering Graphics	3	-	-	3	3	20	20	60	100	-	-	-	100
4	ESC	24-ESC-1-04	Smart Building & Materials	2	-	-	2	2	20	20	60	100	-	-	-	100
5	BSC	24-BSC-1-06	Engineering Chemistry Laboratory	-	-	2	2	1	-	-	-	-	25	-	-	25
6	ESC	24-ESC-1-08	Engineering Graphics Lab	-	-	2	2	1	-	-	-	-	25	-	-	25
7	ESC	24-ESC-1-09	Smart Building & Materials Lab	-	-	2	2	1	-	-	-	-	25	-	-	25
8	VSEC	24-VSC-1-02	TechShop	-	-	4	4	2	-	-	-	-	50	-	-	50
9	CCC		Co-curricular Course -I	-	-	2	2	1	-	-	-	-	50	-	-	50
10	IKS	24-IKS-1-01	Indian Knowledge System	-	2	-	2	2	-	-	-	-	50	-	-	50
11	AEC	24-AEC-1-01	Professional Communication Skills	-	1	-	1	1	-	-	-	-	25	-	-	25
Total				11	4	12	27	21	80	80	240	400	250	-	-	650

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Course Code	Bucket of Co-curricular Course
24-CCC-1-A	Yoga
24-CCC-1-B	Sports
24-CCC-1-C	NSS (National Service Scheme)
24-CCC-1-D	Cultural

Note: Students have to select any one course from the above basket.

Induction Program (Mandatory)	3 Weeks Duration
The induction program (as per AICTE guidelines) is to be completed at the start of the first year.	- SIP Module 1: UHV 1 - SIP Module 2: Physical Health and Related Activities - SIP Module 3: Familiarization of Department/ Branch and Innovation - SIP Module 4: Visit to a Local Area - SIP Module 5: Lectures by Eminent People - SIP Module 6: Proficiency Modules - SIP Module 7: Literature / Literary Activities - SIP Module 8: Creative Practices - SIP Module 9: Extra Curricular Activities

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Semester – II

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme							Total Marks
				Hours			Total Hours	Credits	Theory Course				Lab Course			
				L	T	P			CIE	MSE	SEE	TH Marks	TW	PR	OR	
1	BSC	24-BSC-1-01	Engineering Physics	3	-	-	3	3	20	20	60	100	-	-	-	100
2	BSC	24-BSC-1-04	Statistics and Integral Calculus	3	-	-	3	3	20	20	60	100	-	-	-	100
3	ESC	24-ESC-1-01	Basic Electrical and Electronics Engineering	3	-	-	3	3	20	20	60	100	-	-	-	100
4	ESC	24-ESC-1-06	Programming and Problem Solving using Python	2	-	-	2	2	20	20	60	100	-	-	-	100
5	PCC	24-PCC-CE-1-01	Engineering Mechanics	2	-	-	2	2	20		30	50	-	-	-	50
6	BSC	24-BSC-1-05	Engineering Physics Laboratory	-	-	2	2	1	-	-	-	-	25	-	-	25
7	ESC	24-ESC-1-05	Basic Electrical and Electronics Engineering Lab	-	-	2	2	1	-	-	-	-	25	-	-	25
8	ESC	24-ESC-1-10	Python Programming Lab	-	-	2	2	1	-	-	-	-	25	-	-	25
9	PCC	24-PCC-CE-1-02	Engineering Mechanics Lab	-	-	2	2	1	-	-	-	-	25	25	-	50
10	VSEC	24-VSC-1-01	TechSkill	-	-	4	4	2	-	-	-	-	50	-	-	50
11	CCC	24-CCC-1-05	Co-curricular Course -II	-	-	4	4	2	-	-	-	-	25	-	-	25
Total				**13**	**-**	**16**	**29**	**21**	**100**	**80**	**270**	**450**	**175**	**25**	**-**	**650**

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Level 4.5 Exit Criteria: Mandatory Courses to be completed after first year for obtaining One Year UG Certificate in Civil Engineering

Sr. No	Category	Course Code	Course Name	Teaching Scheme				Cred its	Evaluation Scheme								Total Marks
				Hours					Theory Course				Lab Course				
				L	T	P	Total Hours		CIE	MSE	SEE	TH Marks	TW	PR	OR		
1	EXT	24-EXT-1-01	Internship / Fieldwork/OJT	-	-	8	8	4	-	-	-	-	100	-	-	100
2	EXT	24-EXT-1-02	Mini Project	-	-	8	8	4	-	-	-	-	50	-	50	100
Total				-	-	16	16	8	-	-	-	-	150	-	50	200

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TEACHING AND EVALUATION SCHEME FOR SECOND YEAR B-TECH

Semester – III

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme							Total Marks
				Hours				Credits	Theory Course				Lab Course			
				L	T	P	Total Hours		CIE	MSE	SEE	TH Marks	TW	PR	OR	
1	PCC	24-PCC-CE-2-01	Numerical Methods & Statistics	3	-	-	3	3	20	20	60	100	-	-	-	100
2	PCC	24-PCC-CE-2-02	Strength of Materials	3	-	-	3	3	20	20	60	100	-	-	-	100
3	PCC	24-PCC-CE-2-03	Surveying	3	-	-	3	3	20	20	60	100	-	-	-	100
4	MD M		Multi Disciplinary Minor-I	2	-	-	2	2	20	-	30	50	-	-	-	50
5	MD M		Multi Disciplinary Minor-I Lab	-	-	2	2	1	-	-	-	-	25	-	25	50
6	PCC	24-PCC-CE-2-04	Strength of Materials Lab	-	-	2	2	1	-	-	-	-	25	25	-	50
7	PCC	24-PCC-CE-2-05	Surveying Lab	-	-	2	2	1	-	-	-	-	25	25	-	50
8	EEM	24-EEM-2-01	Engineering Economics	1	-	2	3	2	-	-	-	-	25	-	-	25
9	AEC	24-AEC-2-01	Business Communication Skill	-	-	2	2	1	-	-	-	-	25	-	-	25
10	VEC	24-VEC-2-01	Universal Human Values-II	3	-	-	3	3	-	-	-	-	50	-	-	50
11	ELC (CEP/FP)	24-ELC-CE-2-01	Mini Project	-	-	4	4	2	-	-	-	-	25	-	25	50
12	VEC	24-VEC-2-02	Environmental Science	1	-	-	1	-	-	-	-	-	-	-	-	-
Total				16	-	14	30	22	80	60	210	350	200	50	50	650

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Semester – IV

Sr. No	Category	Course Code	Course Name	Hours L	T	P	Total Hours	Credits	CIE	MSE	SEE	TH Marks	TW	PR	OR	Total Marks
1	PCC	24-PCC-CE-2-06	Structural Analysis	3	-	-	3	3	20	20	60	100	-	-	-	100
2	PCC	24-PCC-CE-2-07	Geotechnical Engineering	3	-	-	3	3	20	20	60	100	-	-	-	100
3	MD M		Multi Disciplinary Minor-II	3	-	-	3	3	20	20	60	100	-	-	-	100
4	OE/OEC		Open Elective-I	3	-	-	3	3	20	20	60	100	-	-	-	100
5	PCC	24-PCC-CE-2-08	Structural Analysis Lab	-	-	2	2	1	-	-	-	-	25	25	-	50
6	PCC	24-PCC-CE-2-09	Geotechnical Engineering Lab	-	-	2	2	1	-	-	-	-	25	25	-	50
7	AEC		Modern Language	1	-	2	3	2	-	-	-	-	-	-	25	25
8	EEM	24-EEM-2-02	Entrepreneurship Development	1	-	2	3	2	-	-	-	-	50	-	-	50
9	VSEC	24-VSEC-CE-2-01	Drawing Assessment & calculation	-	-	4	4	2	-	-	-	-	25	25	-	50
10	VEC	24-VEC-2-03	Digital and Technological Solutions	1		2	3	2	-	-	-	-	25	-	-	25
Total				15	-	14	29	22	80	80	240	400	150	75	25	650

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AEC- Modern Language Basket		
Course Code	**Course Name**	**Course Category**
24-AEC-2-02-A	Marathi	Modern Indian Languages
24-AEC-2-02-B	Hindi	
24-AEC-2-02-C	Sanskrit	
24-AEC-2-02-D	Japanese	Foreign Languages
24-AEC-2-02-E	German	
24-AEC-2-02-F	French	

Note: Students have to select any one course from the above basket.

Level 5.0 Exit Criteria
Mandatory Courses to be completed after Second Year for obtaining Two Years UG Diploma in Civil Engineering

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme							
				Hours				Credits	Theory Course				Lab Course			Total Marks
				L	T	P	Total Hours		CIE	MSE	SEE	TH Marks	TW	PR	OR	
1	EXT	24-EXT-2-01	Internship / Fieldwork/OJT	-	-	8	8	4	-	-	-	-	100	-	-	100
2	EXT	24-EXT-2-02	Mini Project	-	-	8	8	4	-	-	-	-	50	-	50	100
Total				-	-	16	16	8	-	-	-	-	150	-	50	200

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TEACHING AND EVALUATION SCHEME FOR THIRD YEAR B-TECH
Semester – V

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme								Total Marks
				Hours				Credits	Theory Course				Lab Course				
				L	T	P	Total Hours		CIE	MSE	SEE	TH Marks	TW	PR	OR	
1	PCC	24-PCC-CE-3-01	Reinforced Concrete Structures	3	-	-	3	3	20	20	60	100	-	-	-	100
2	PCC	24-PCC-CE-3-02	Fluid Mechanics	3	-	-	3	3	20	20	60	100	-	-	-	100
3	PEC		Program Elective Course –I	4	-	-	4	4	20	20	60	100	-	-	-	100
4	MD M		Multi Disciplinary Minor-III	2	-	-	2	2	20	-	30	50	-	-	-	50
5	MD M		Multi Disciplinary Minor-III Lab	-	-	2	2	1	-	-	-	-	25	-	25	50
6	OE/OEC		Open Elective-II	3	-	-	3	3	20	20	60	100	-	-	-	100
7	PCC	24-PCC-CE-3-03	Reinforced Concrete Structures Lab	-	-	4	4	2	-	-	-	-	25	25	-	50
8	PCC	24-PCC-CE-3-04	Fluid Mechanics Lab	-	-	2	2	1	-	-	-	-	25	25	-	50
9	PEC		Program Elective Course –I Lab	-	-	4	4	2	-	-	-	-	25	-	25	50
Total				15	0	12	27	21	100	80	270	450	100	50	50	650

	Program Elective Course – I			
	Course Code-TH	Name of the Course- TH	Course Code-PR	Name of the Course(PR/OR)
A	24-PEC-CE-3-01A	Air Pollution and Control	24-PEC-CE-3-02A	Air Pollution and Control Lab
B	24-PEC-CE-3-01B	Advanced Mechanics of Structures	24-PEC-CE-3-02B	Advanced Mechanics of Structures Lab
C	24-PEC-CE-3-01C	Hydrology & Water Resources Engineering	24-PEC-CE-3-02C	Hydrology & Water Resources Engineering Lab
D	24-PEC-CE-3-01D	Introduction to Multimodal Urban Transportation Systems	24-PEC-CE-3-02D	Introduction to Multimodal Urban Transportation Systems Lab

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Semester – VI

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme								Total Marks
				Hours				Cred its	Theory Course				Lab Course			
				L	T	P	Total Hours		CIE	MSE	SEE	TH Marks	TW	PR	OR	
1	PCC	24-PCC-CE-3-05	Design of Steel Structures	3	-	-	3	3	20	20	60	100	-	-	-	100
2	PEC		Program Elective Course–II	3	-	-	3	3	20	20	60	100	-	-	-	100
3	MD M		Multi Disciplinary Minor-IV	2	-	-	2	2	20		30	50	-	-	-	50
4	OE/OEC		Open Elective-III	2	-	-	2	2	20	20	60	100	-	-	-	100
5	PCC	24-PCC-CE-3-06	Design of Steel Structures Lab	-	-	2	2	1	-	-	-	-	25	25	-	50
6	PEC		Program Elective Course–II Lab	-	-	2	2	2	-	-	-	-	25	-	25	50
7	VSEC	24-VSEC-CE-3-01	Computer Aided Design in Civil Engineering	-	-	4	4	2	-	-	-	-	25	25	-	50
8	ELC	24-ELC-CE-3-01	Research Methodology	4	-	-	4	4	20	20	60	100	-	-	-	100
9	ELC	24-ELC-CE-3-02	Project-stage-I	-	-	4	4	2	-	-	-	-	25	-	25	50
Total				14	-	12	26	21	100	80	270	450	100	50	50	650

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Program Elective Courses For SEM VI				
	Course Code-TH	Name of the Course- TH	Course Code-PR	Name of the Course(PR/OR)
A	24-PEC-CE-3-03A	Solid and Hazardous Waste Management	24-PEC-CE-3-04A	Solid and Hazardous Waste Management Lab
B	24-PEC-CE-3-03B	Advanced Design of Reinforced Concrete Structures	24-PEC-CE-3-04B	Advanced Design of Reinforced Concrete Structures Lab
C	24-PEC-CE-3-03C	Dams and Hydraulic Structures	24-PEC-CE-3-04C	Dams and Hydraulic Structures Lab
D	24-PEC-CE-3-03D	Traffic Systems and Engineering	24-PEC-CE-3-04D	Traffic Systems and Engineering Lab

Level 5.5 Exit Criteria
Mandatory Courses to be completed after Third Year for obtaining Three Year Bachelor's Degree in Vocation (B. Voc.) in Civil Engineering

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme							Total Marks
				Hours				Credits	Theory Course				Lab Course			
				L	T	P	Total Hours		CIE	MSE	SEE	TH Marks	TW	PR	OR	
1	EXT	24-EXT-3-01	Internship / Fieldwork/OJT	-	-	8	8	4	-	-	-	-	100	-	-	100
2	EXT	24-EXT-3-02	Mini Project	-	-	8	8	4	-	-	-	-	50	-	50	100
Total				-	-	16	16	8	-	-	-	-	150	-	50	200

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TEACHING AND EVALUATION SCHEME FOR FINAL YEAR B-TECH
Semester – VII

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme								
				Hours			Total Hours	Credits	Theory Course				Lab Course			Total Marks
				L	T	P			CIE	MSE	SEE	TH Marks	TW	PR	OR	
1	PCC	24-PCC-CE-4-01	Transportation Engineering	3	-	-	3	3	20	20	60	100	-	-	-	100
2	PCC	24-PCC-CE-4-02	Environmental Engineering	3	-	-	3	3	20	20	60	100	-	-	-	100
3	PEC		Program Elective Course –III	4	-	-	4	4	20	20	60	100	-	-	-	100
4	MD M		Multi Disciplinary Minor-V	2	-	-	2	2	20	-	30	50	-	-	-	50
5	MD M		Multi Disciplinary Minor -V Lab	-	-	2	2	1	-	-	-	-	25	-	25	50
6	PCC	24-PCC-CE-4-03	Transportation Engineering Lab	-	-	2	2	1	-	-	-	-	25	25	-	50
7	PCC	24-PCC-CE-4-04	Environmental Engineering Lab	-	-	4	4	2	-	-	-	-	25	-	25	50
8	PEC		Program Elective Course –III Lab	-	-	4	4	2	-	-	-	-	25	25	-	50
9	ELC	24-ELC-CE-4-01	Project-stage -II	-	-	6	6	3	-	-	-	-	50	-	50	100
Total				12	-	18	30	21	80	60	210	350	150	50	100	650

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	Program Elective Course For SEM VII			
	Course Code-TH	**Name of the Course- TH**	**Course Code-PR**	**Name of the Course(PR/OR)**
A	24-PEC-CE-4-05A	Industrial Waste Water Treatment	24-PEC-CE-4-06A	Industrial Waste Water Treatment Lab
B	24-PEC-CE-4-05B	Design of Pre-stressed Concrete Structures	24-PEC-CE-4-06B	Design of Pre-stressed Concrete Structures Lab
C	24-PEC-CE-4-05C	Hydropower Engineering	24-PEC-CE-4-06C	Hydropower Engineering Lab
D	24-PEC-CE-4-05D	Intelligent Transport System	24-PEC-CE-4-06D	Intelligent Transport System Lab

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Semester – VIII

Sr. No	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme								Total Marks
				Hours				Credits	Theory Course				Lab Course				
				L	T	P	Total Hours		CIE	MSE	SEE	TH Marks	TW	PR	OR		
1	PCC	24-PCC-CE-4-05	Hydraulic Engineering	3	-	-	3	3	40	-	60	100	-	-	-		100
2	PEC		Program Elective Course –IV	3	-	-	3	3	40	-	60	100	-	-	-		100
3	MD M		Multi Disciplinary Minor-VI	3	-	-	3	3	40	-	60	100	-	-	-		100
4	ELC	24-ELC-CE-4-02	Internship	-	-	24	24	12	-	-	-	-	200	-	150		350
Total				9	-	24	33	21	120	-	180	300	200	-	150		650

Program Elective Course For SEM VIII		
	Course Code-TH	Name of the Course- TH
A	24-PEC-CE-4-07A	Sanitation Engineering
B	24-PEC-CE-4-07B	Finite Element Analysis
C	24-PEC-CE-4-07C	Watershed Management
D	24-PEC-CE-4-07D	Pavement Design & Economics