NETAJI SUBHAS UNIVERSITY

JAMSHEDPUR, JHARKHAND

Established under the **Jharkhand State Private University Act, 2018**

Approved by AICTE, PCI, BCI, NCTE, INC & JNRC

COURSE STRUCTURE & DETAILED SYLLABUS

OF

CIVIL ENGINEERING

FOR

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2025-2026)

DEPARTMENT OF CIVIL ENGINEEERING

NETAJI SUBHAS UNIVERSITY, JAMSHEDPUR

Pokhari, Near Bhilai Pahadi, Jamshedpur,Jharkhand

PREAMBLE

Civil engineering

It comprises of basic science and engineering courses, having focus on fundamentals, significant discipline level courses and ample electives both from the disciplines and cross disciplines including emerging areas all within a cumulative structure of 160 credits. Summer Internships have been embedded to make the student understand the industry requirements and have hands on experience. Virtual Labs has been introduced for few experiments. These features will allow students to develop a problem-solving approach to face the challenges in the future and develop outcome based learning approach.

The idea behind this is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

It focuses on the design, construction, and maintenance of infrastructure. Students will learn about structural analysis, geotechnical engineering, transportation planning, and environmental considerations. This program prepares students for career in areas like building construction, bridge design, and urban planning.

VISION

To become and stay as a center of excellence in the field of Civil Engineering and contribute for the building up of a better living environment, infrastructural facilities and the protection of natural resources.

MISSION

- To contribute to the society by successfully training high quality Civil Engineering graduates.
- To impart high quality education to enable students face challenges in the fields of Civil Engineering.
- To provide facilities, infrastructure, environment to develop the spirit of innovation, creativity, and research among students and faculty.
- To inculcate ethical, moral values and lifelong learning skills in students to address the societal needs.
- To transform the students as leaders in Civil Engineering to achieve professional excellence in the challenging world.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO-1	Become successful civil engineering professionals either in government agencies or in private companies
PEO-2	Become responsible Civil Engineers with good leadership qualities to respond and contribute to the society in solving problems.
PEO-3	Engage in lifelong learning with good computational skills and work with multi-disciplinary approach and team spirit.
PEO-4	Equip the graduates with strong knowledge, competence and soft skills that allows them to contribute ethically to the needs of society and become successful entrepreneurs.

PROGRAM OUTCOMES (POs)

PO-1	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO-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.
PO-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.

PO-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.
PO-5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO-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.
PO-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.
PO-8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO-9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO-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.
PO-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.
PO-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.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO-1	Analyze and design of civil engineering structures.
PSO-2	Should be able to clearly understand the concepts and applications in the field of survey
PSO-3	Should have the capability to comprehend the use of modern design tools to analyze and design the structures.

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B. TECH IN CIVIL ENGINEERING COURSE STRUCTURE

GENERAL COURSE STRUCTURE & THEME

A. 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 (P) per week	1 Credit

B. Range of Credits: In the light of the fact that a typical Model Four-year Under Graduate degree program in Engineering has about 160 credits, the total number of credits proposed for the four-year B. Tech/B.E. in Civil Engineering (Engineering & Technology) is kept as 160.

C. Structure of UG Program in CE: The structure of UG program in Civil Engineering shall have essentially the following categories of courses with the breakup of credits as given:

Sl.	Category	Suggested Breakup of Credits (Total 168)
1	Humanities and Social Sciences including Management Courses	06
2	Basic Science Courses	24
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	20
4	Professional core courses	62
5	Professional Elective courses relevant to chosen specialization/branch	26
6	Indian Knowledge System	02
7	Multidisciplinary Open Electives Courses	12
8	Project work, seminar and internship in industry or appropriate work place/ academic and research institutions in India/abroad	16
9	Mandatory Non Credit Courses – Audit Course	(non-credit)
Total		**168***

**Minor variation is allowed as per need of the respective disciplines.*

D. Course code and definition:

Course code	Definitions
L	Lecture
T	Tutorial
P	Practical
C	Credits

BSC	Basic Science Courses
ESC	Engineering Science Courses
HSMC	Humanities and Social Sciences including Management courses
PCC	Professional core courses
PEC	Professional Elective courses
MOPEC	Multidisciplinary Open Electives Courses
LC	Laboratory course
MNC- AU	Mandatory Non-Credit Courses – Audit Course
EEC	Employment Enhancement Courses (Project/Summer Internship/Seminar)

Category-wise Courses

HUMANITIES & SOCIAL SCIENCES COURSES [HS] & MANAGEMENT COURSES

(2 compulsory + 2 others)

Number of Humanities & Social Science Courses: 4
Credits: 12

Sl.	Code No.	Subject	Semester	Credits
1	HSMC 01	Communication Skills / English (Compulsory	2	2:0:2=3
2	HSMC 02	Universal Human Values-2 (Compulsory course)	2	2:1:0=3
			Total Credits:	**06**

BASIC SCIENCE COURSE [BSC] (Total 8)

Sl.	Code No.	Subject	Semester	Credits
1	BSC 101	Physics-1 (Electromagnetism)	1	3:1:2=5
3	BSC 102	Mathematics-1 (Calculus & Linear Algebra)	1	3:1:0=4
4	BSC 103	Chemistry-1	2	3:0:2=4
5	BSC 104	Mathematics-2 (ODE, Complex variables)	2	3:1:0=4
7	BSC 203	Biology for Engineers	3	3:0:0=3
6	BSC 202	Mathematics for Civil Engineering	3	3:1:0=4
7	BSC 204	Environment Science (Audit)	3	2:0:0=0
			Total Credits:	**29**

ENGINEERING SCIENCE COURSE [ESC] (Total 8)

Sl.	Code No.	Subject	Semester	Credits
1	ESC 101	Basic Electrical Engineering	1	2:1:2=4
2	ESC 102	Engineering Graphics & Design	1	1:0:4=3
3	ESC 103	Design Thinking + Idea Lab (Audit)	1	0:0:2=1
4	ESC 104	Programming for Problem Solving	2	2:0:4=4
5	ESC 105	Manufacturing Practice Workshop	2	0:0:4=2
6	ESC 201	Civil Engineering Materials, Testing & Evaluation	3	3:1:2=5
7	ESC 202	Solid Mechanics	3	3:1:0=4
			Total Credits:	**23**

PROFESSIONAL CORE COURSES [PCC] (Total 16)

Sl.	Code No.	Subject	Semester	Credits
1	PCC- CE 201	Building Planning and Computer-aided Civil Engineering Drawing	4	3:1:0=4
2	PCC- CE 202	Concrete Technology	4	3:1:0=4
3	PCC- CE 203	Fluid Mechanics	4	3:1:0=4
4	PCC- CE 204	Transportation Engineering	4	3:1:0=4
5	PCC- CE 205	Surveying and Geomatics	4	3:1:0=4
6	PCC- CE 206	Geotechnical Engineering	4	0:1:2=2
7	PCC- CE 301	Hydraulic Engineering	5	3:1:0=4
8	PCC- CE 302	Structural Analysis	5	3:0:2=4
9	PCC- CE 303	Construction Engineering & Management	5	3:1:0=4
10	PCC- CE 304	Structural Design-I	5	3:0:2=4
11	PCC- CE 305	Environmental Engineering	5	0:1:2=2
12	PCC- CE 306	Engineering Economics, Estimation & Costing	6	3:0:2=4
13	PCC- CE 307	Hydrology & Water Resources Engineering	6	3:0:2=4
14	PCC- CE 308	Structural Design -II	6	3:1:0=4
15	PCC- CE 309	Intelligent Transportation Systems	6	3:1:0=4
16	PCC- CE 310	Sustainable and Green Construction	6	0:1:2=2
			Total Credits:	**58**

PROFESSIONAL ELECTIVE [PEC]

(Total 3 to be taken, at least one from each group)

Sl.	Code No.	Subject	Semester	Credits
		TECHNOLOGY GROUP		
1	PEC –CE 401	Plumbing (Water & Sanitation)	7 / 8	3:0:0=3
2	PEC –CE 402	Contract Management	7 / 8	3:0:0=3
3	PEC –CE 403	Pre-stressed Concrete	7 / 8	3:0:0=3
4	PEC –CE 404	Environmental Health & Safety	7 / 8	3:0:0=3
5	PEC –CE 405	Soil dynamics & Machine Foundation	7 / 8	3:0:0=3
6	PEC –CE 406	Port Harbor Engineering	7 / 8	3:0:0=3
7	PEC –CE 407	Total Station & GPS Survey	7 / 8	3:0:0=3
8	PEC –CE 408	Intelligent Transportation System	7 / 8	3:0:0=3
		INDUSTRY SECTOR GROUP		
1	PEC –CE 401	Environmental Engineering	7 / 8	3:0:0=3
2	PEC –CE 402	Estimation Engineering	7 / 8	3:0:0=3
3	PEC –CE 403	Concrete Design Engineering	7 / 8	3:0:0=3
4	PEC –CE 404	Environmental Engineering	7 / 8	3:0:0=3
5	PEC –CE 405	Geotechnical Engineering	7 / 8	3:0:0=3
6	PEC –CE 406	Marine Engineering	7 / 8	3:0:0=3
7	PEC –CE 407	Survey Engineering	7 / 8	3:0:0=3
8	PEC –CE 408	Transportation Engineering	7 / 8	3:0:0=3
			Total Credits:	**24**

MOPEC(Multidisciplinary Open Elective Courses

Sl.	Code No.	Subject	Semester	Credits
1	MOPEC-01	Earth Retaining Structures	5	3:0:0=3
2	MOPEC-02	Ground Improvement Technique	6	3:0:0=3
3	MOPEC-03	Water Quality & Management	7	3:0:0=3
4	MOPEC-04	Earthquake Engineering	8	3:0:0=3
			Total Credits:	**12**

ENGINEERING PROJECT (3 Stages)

Sl.	Code No.	Subject	Semester	Credits
1	PROJ- CE 311	Engineering Project-1 (Literature Review)	6	0:0:4=2
2	PROJ- CE 401	Engineering Project-2 (Design & Analysis)	7	0:0:10=5
3	SEM- CE 402	Seminar	7	0:0:2=1
4	PROJ- CE 403	Engineering Project-3 (Prototype & Testing)	8	0:0:16=8
			Total Credits:	**16**

TOTAL = 168 credits | BSC = 18%, ESC = 15%, PCC = 36%, PEL+HSM+OEL = 9%, PROJ = 12% || LABS = 10%

NEW AND ELECTRONICS/IT-ORIENTED CORE COURSES

Sl.	Code No.	Subject	Semester	Credits
1	ESC 103	Design Thinking & Idea Lab (New)	1	0:0:2=1
2	ESC 103	Programming for Problem Solving	2	3:0:4=5
3	ESC 201	Basic Electronics Engineering	3	3:1:2=5
4	PCC CE 302	Robotics and Automation (New)	5	3:1:0=4
5	PCC CE 306	Computer-Aided Design and Analysis (New)	6	3:1:0=4
6	PCC CE 307	STaad-Pro(Updated)	6	3:1:0=4
7	PCC CE 309	Product Innovation and Entrepreneurship (New)	7	3:1:0=4
			Total Credits:	**27**

INDUCTION PROGRAM

The Essence and Details of Induction program can also be understood from the „Detailed Guide on Student Induction program", as available on AICTE Portal, (Link:https://www.aicteindia.org/sites/default/files/Detailed%20Guide%20on%20Student%20Induc tion%20program.pdf).

Induction program (mandatory)	Three-week 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

Mandatory Visits/ Workshop/Expert Lectures:

a. It is mandatory to arrange one industrial visit every semester for the students of each branch.

b. It is mandatory to conduct a One-week workshop during the winter break after fifth semester on professional/ industry/ entrepreneurial orientation.

c. It is mandatory to organize at least one expert lecture per semester for each branch by inviting resource persons from domain specific industry.

Evaluation Scheme (Suggestive only):

a. **For Theory Courses**:

(The weightage of Internal assessment is 40% and for End Semester Exam is 60%)

b. For Practical Courses:

(The weightage of Internal assessment is 60% and for End Semester Exam is 40%)

c. For Summer Internship / Projects / Seminar etc.

Evaluation is based on work done, quality of report, performance in viva-voce, presentation etc.

Note: The internal assessment is based on the student‟s performance in mid semester tests (two best out of three), quizzes, assignments, class performance, attendance, viva-voce in practical, lab record etc.

Mapping of Marks to Grades

Each course (Theory/Practical) is to be assigned 100 marks, irrespective of the number of credits, and the mapping of marks to grades may be done as per the following table:

Range of Marks	**Assigned Grade**
91-100	A^+
81-90	A
71-80	B^+
61-70	B
51-60	C^+
46-50	C
40-45	D
< 40	F (Fail due to less marks)

Semester wise Structure

SEMESTER-I

Sl.	Code No.	Category	Name of the Subjects	Periods			Credits	Marks		
				L	T	P		IA	TE	TM
1	BTBSC101	BSC	Engineering Mathematics- I	3	1	0	4	40	60	100
2	BTBSC102	BSC	Engineering Physics-1	3	1	-	4	40	60	100
3	BTESC103	ESC	Basics of Electrical Engineering	3	0	-	3	40	60	100
4	BTESC104	ESC	Engineering Drawing	1	0	-	1	40	60	100
5	BTMC105	MC	Indian Knowledge System	3	0	-	3	40	60	100
			Practical							
6	BTBSC102P	BSC	Engineering Physics Lab	-	-	2	1	20	30	50
7	BTESC 103P	ESC	Basics of Electrical Engineering Lab	-	-	2	1	20	30	50
8	BTESC 104P	ESC	Engineering Drawing & Computer Graphics Lab	-	-	4	2	20	30	50
9	BTESC107P	ESC	Design Thinking & IDEA Lab	-	-	2	1	20	30	50
10	BTAU 106	AU	Sports/NSS/NCC/YOGA/Painting/Music/Classical dance		-	2	0	-	-	-
Total				**13**	**2**	**12**	**20**	**320**	**380**	**700**

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SEMESTER-II

Sl.	Code No.	Category	Name of the Subjects	Periods			Credits	Marks		
				L	T	P		IA	TE	TM
1	BTBSC201	BSC	Engineering Mathematics -II	3	1	-	4	40	60	100
2	BTBSC202	BSC	Engineering Chemistry	3	0	-	3	40	60	100
3	BTHSMC203	HSMC	English for technical writing	2	0	0	2	40	60	100
4	BTESC 204	ESC	Programming for Problem Solving	2	0	-	2	40	60	100
5	BTHSMC205	HSMC	Universal Human Values	2	1	0	3	40	60	100
Practical										
6	BTBSC202P	BSC	Engineering Chemistry Lab	-	-	2	1	20	30	50
7	BTHSMC203P	HSMC	English for technical writing	0	0	2	1	20	30	50
8	BTESC204P	ESC	Programming for Problem Solving Lab	-	-	4	2	20	30	50
9	BTESC206P	ESC	Manufacturing Practices Workshop			4	2	20	30	50
Total				**12**	**2**	**12**	**20**	**320**	**380**	**700**

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SEMESTER-III

Sl.	Code No.	Category	Name of the Subjects	Periods			Credits	Marks		
				L	T	P		IA	TE	TM
1	BTESC301	ESC	Solid Mechanics	3	0	0	3	40	60	100
2	BTBSC302	BSC	Mathematics to Civil Engineering -I	3	1	0	4	40	60	100
3	BTESC303	ESC	Civil Engineering Materials, Testing & Evaluation	1	0	0	1	20	30	50
4	BTCE304	PCC	Building Planning and Computer Aided Civil Engineering Drawing	2	0	0	2	40	60	100
5	BTCE305	PCC	Concrete Technology	2	0	0	2	40	60	100
6	BTCE306	PCC	Fluid Mechanics	3	0	0	3	40	60	100
7	BTCE307	IKS	From Basket	2	0	0	2	40	60	100
Practical										
8	BTCE305P	PCC	Concrete Technology Lab	0	0	2	1	20	30	50
9	BTCE306P	PCC	Fluid Mechanics Lab	0	0	2	1	20	30	50
10	BTESC301P	ESC	Solid Mechanics Lab	0	0	2	1	20	30	50
11	BTESC303P	ESC	Civil Engineering Materials, Testing & Evaluation Lab	0	0	2	1	20	30	50

12	BTCE304P	PCC	Building Planning and Computer Aided Civil Engineering Drawing Lab	0	0	2	1	20	30	50
Total				**16**	**1**	**4**	**22**	**360**	**540**	**900**

SEMESTER-IV

Sl.	Code No.	Category	Name of the Subjects	Periods			Credits	Marks		
				L	T	P		IA	TE	TM
1	BTCE401	PCC	Transportation Engineering	2	0	0	2	40	60	100
2	BTCE402	PCC	Surveying and Geomatics	3	0	0	3	40	60	100
3	BTCE403	PCC	Geotechnical Engineering	3	0	0	3	40	60	100
4	BTCE404	PCC	Hydraulic Engineering	3	0	0	3	40	60	100
5	BTCE405	PCC	Structural Analysis	3	1	0	4	40	60	100
6	BTCE406	PCC	Construction Engineering & Management	3	0	0	3	40	60	100
Practical										
7	BTCE404P	PCC	Hydraulic Engineering Lab	0	0	2	1	20	30	50
8	BTCE401P	PCC	Transportation Engineering Lab	0	0	2	1	20	30	50
9	BTCE402P	PCC	Surveying and Geomatics Lab	0	0	2	1	20	30	50
10	BTCE406P	PCC	Geotechnical Engineering Lab	0	0	2	1	20	30	50
Total				**17**	**1**	**4**	**22**	**320**	**480**	**800**

SEMESTER-V

Sl.	Code No	Category	Name of the subjects	Periods			Credits	Marks		
				L	T	P		IA	TE	TM
1	BTCE501	PCC	Structural Design -I	3	0	0	3	40	60	100
2	BTCE502	PCC	Environmental Engineering	3	0	0	3	40	60	100
3	BTCE503	PCC	Engineering Economics, Estimation & Costing	3	0	0	3	40	60	100
4	BTCE504	PCC	Hydrology & Water Resources Engineering	3	0	0	3	40	60	100
5	BTCE505	PEC - 01	Plumbing (Water and Sanitation)	3	0	0	3	40	60	100
6	BTEEC506	MOPEC-01	Earth retaining Structures	3	0	0	3	40	60	100
			Practical							
7	BTCE502P	PCC	Environmental Engineering Lab	0	0	2	1	20	30	50
8	BTCE504P	PCC	Structural design Lab	0	0	2	1	20	30	50
9	BTCE503P	PCC	Engineering Economics, Estimation & Costing Lab	0	0	2	1	20	30	50
10	BTCE505P	PEC - 01	Plumbing (Water and Sanitation) Lab	0	0	2	1	20	30	50
11	BTEEC507P	EEC	Internship / Summer Industrial Training/ Semminar (4-6 Week)	0	0	4	2	20	30	50
TOTAL				**18**	**3**	**6**	**24**	**340**	**510**	**850**

SEMESTER-VI

Sl.	Code No	Category	Name of the subjects	Periods			Credits	Marks		
				L	T	P		IA	TE	TM
1	BTCE601	PCC	Structural Design- II	3	0	0	3	40	60	100
2	BTCE602	PCC	Intelligent Transportation System	3	0	0	3	40	60	100
3	BTCE603	PCC	Sustainable and Green construction	3	1	0	4	40	60	100
4	BTCE604	PEC - 02	Contract Management	3	0	0	4	40	60	100
5	BTCE605	PEC- 03	Pre-stressed Concrete	3	0	0	3	40	60	100
6	BTCE606	MOPEC -02	Ground Improvement Techniques	3	0	0	3	40	60	100
			Practical							
7	BTCE601P	PCC	Structural Design Lab- II	0	0	2	1	20	30	50
8	BTCE602P	PCC	Pre-stressed Concrete lab	0	0	2	1	20	30	50
9	BTCE607P	EEC	Engg Project – I (Literature Review)	0	0	4	2	20	30	50
TOTAL				**18**	**1**	**12**	**24**	**300**	**450**	**750**

SEMESTER-VII

Sl.	Code No	Category	Name of the subjects	Periods			Credits	Marks		
				L	T	P		IA	TE	TM
1	BTCE701	PEC-04	Environmental Health and Safety	2	0	0	3	40	60	100
2	BTCE702	PEC-05	Soil dynamics and Machine foundation	3	0	0	3	40	60	100
3	BTCE703	MOPEC -03	Water Quality and Management	3	0	0	3	40	60	100
			Practical							
7	BTCE705P	EEC	Engg. Project – 2 (Design & Analysis)	0	0	10	5	40	60	100
10	BTEEC706P	EEC	Internship /Summer Industrial Training/ Seminar (4-6 Week)	0	0	4	2	30	20	50
TOTAL				**08**	**0**	**14**	**16**	**190**	**260**	**450**

SEMESTER -VIII

Sl.	Code No.	Category	Name of the Subjects	Periods			Credits	Marks		
				L	T	P		IA	TE	TM
1	BTCE801	PEC-06	Port Harbor Engineering	3	0	0	3	40	60	100
2	BTCE802	MOPEC -04	Earthquake Engineering	3	0	0	3	40	60	100
3	BTCE803	PEC-07	Total station and GPS surveying	2	0	0	2	40	60	100
4	BTCE804	PEC-08	Intelligent Transportation Systems	3	0	0	3	40	60	100
Practical										
3	BTCE803P	EEC	Engineering Project-3 (Prototype & Testing)	-	-	16	8	80	120	200
	BTCE803P	PEC-07	Total station and GPS surveying Lab	0	0	2	1	20	30	50
TOTAL				**11**	**0**	**18**	**20**	**260**	**390**	**650**

PROFESSIONAL ELECTIVE COURSES

CATEGORY	TECHNOLOGY GROUP	INDUSTRY SECTOR GROUP	CEDITS
PEC	Plumbing (Water and Sanitation)	Environmental Engineering	3
PEC	Contract Management	Estimation Engineering	3
PEC	Pre-stressed Concrete	Concrete Design Engineering	3
PEC	Environmental Health and Safety	Environmental Engineering	3
PEC	Soil dynamics and Machine foundation	Geotechnical Engineering	3
PEC	Port Harbor Engineering	Marine Engineering	3
PEC	Total station and GPS surveying	Geotechnical Engineering	3
PEC	Intelligent Transportation Systems	Geotechnical Engineering	3

MULTIDISCIPLINARY OPEN ELECTIVE COURSES & AUDIT COURSES

Sl.	Category	Name of the Subject	Semester	Credits
1	MOPEC	Earth retaining Structures	5/8	3
2	MOPEC	Ground Improvement Techniques	6/8	3
3	MOPEC	Water Quality and Management	7/8	3
4	MOPEC	Rainwater harvesting	7/8	3
5	MOPEC	Earthquake Engineering	8/8	3
6	AU	Instrumentation & Sensor Technologies For Civil Engineering Applications	6/8	3

HUMANITIES & SOCIAL SCIENCES COURSES [HS] & MANAGEMENT COURSES

Humanities & Social Sciences & Mgt. Electives (HSM): Any 2 courses from the list of those offered.

Sl.	Category	Subject	Semester	Credits
1	HSMC	Communication Skills / English (Compulsory	2	3
2	HSMC	Universal Human Values-2 (Compulsory course)	2	3

Employment Enhancement Courses

Sl.	Category	Subject	Semester	Credits
1	EEC	Employment Enhancement Course-I	5	**01**
2	EEC	Employment Enhancement Course-II	6	**01**
3	EEC	Internship / Summer Industrial Training/ Semminar (4-6 Week)	5/7	**04**
4	EEC	Engg Project – I/II/III	6/7/8	**15**