



NANDHA ENGINEERING COLLEGE

(Autonomous)

Affiliated to Anna University Chennai + Approved by AICTE + Accredited by NBA-NewDelhi

Pitchandampalayam, (P.O), Vaikkalmedu, Erode - Perundurai Road, Erode - 638 052

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1.1.2 Details of Courses where syllabus revision was carried out in

B.E - Civil Engineering

Course Code	Course Name	% of Change
17MYB01	Calculus and Solid Geometry	50
17CYB01	Applied Chemistry	30
17MYB02	Complex Analysis and Laplace Transforms	50
17MYB03	Fourier Series and Partial Differential Equations	20
17CEC05	Building Materials	70
17CEC06	Surveying	20
17CEC10	Applied Hydraulics Engineering	70
17CEC15	Water Resources and Irrigation Engineering	30
17CEC12	Structural Analysis - I	20
17CEC14	Foundation Engineering	20
17CEP05	Concrete and Highway Engineering Laboratory	50
17CEC18	Design of Reinforced Concrete Structures	20
17CEP08	Survey Camp	30
17GED06	Comprehension	80
17CEX23	Pre-fabricated Structures	80
Average		42.67 %



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B.E. CIVIL ENGINEERING

CURRICULUM & SYLLABUS: I - VIII SEMESTERS

SEMESTER: I									
SL.NO	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C
THEORY									
1.	17EYA01	Professional English - I	HS	NIL	4	2	0	2	3
2.	17MYB01	Calculus and Solid Geometry	BS	NIL	5	3	2	0	4
3.	17PYB01	Physics for Engineers	BS	NIL	3	3	0	0	3
4.	17CYB01	Applied Chemistry	BS	NIL	3	3	0	0	3
5.	17MEC01	Engineering Graphics	ES	NIL	4	2	2	0	3
6.	17CEC01	Fundamentals of Engineering Mechanics	ES	NIL	5	3	2	0	4
PRACTICALS									
7.	17GYP01	Physics and Chemistry Laboratory	BS	NIL	4	0	0	4	2
8.	17GYP02	Engineering Practices Laboratory	ES	NIL	4	0	0	4	2
9.	17GEP01	Personal Values	HS	NIL	2	0	0	2	0
TOTAL					34	16	6	12	24

SEMESTER: II									
SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C
THEORY									
1.	17EYA02	Professional English – II	HS	17EYA01	4	2	0	2	3
2.	17MYB02	Complex Analysis and Laplace Transforms	BS	17MYB01	5	3	2	0	4
3.	17PYB03	Materials Physics	BS	17PYB01	3	3	0	0	3
4.	17CYB03	Environmental Science	BS	NIL	3	3	0	0	3
5.	17EEC01	Basic Electrical and Electronics Engineering	ES	NIL	3	3	0	0	3
6.	17CSC01	Problem Solving and Python Programming	ES	NIL	3	3	0	0	3
PRACTICALS									
7.	17CSP01	Problem Solving and Python Programming Laboratory	ES	NIL	4	0	0	4	2
8.	17CEP01	Building Drawing – I	ES	NIL	4	0	0	4	2
9.	17GEP02	Inter Personal Values	HS	17GEP01	2	0	0	2	0
TOTAL					31	17	2	12	23



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SEMESTER: III									
SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C
THEORY									
1.	17MYB03	Fourier Series and Partial Differential Equations	BS	NIL	4	2	2	0	3
2.	17CEC02	Engineering Geology	PC	NIL	3	3	0	0	3
3.	17CEC03	Mechanics of Solids – I	ES	17CEC01	5	3	2	0	4
4.	17CEC04	Mechanics of Fluids	PC	NIL	3	3	0	0	3
5.	17CEC05	Building Materials#	PC	NIL	5	3	0	2	4
6.	17CEC06	Surveying	PC	NIL	3	3	0	0	3
PRACTICALS									
7.	17CEP02	Surveying Laboratory	PC	NIL	4	0	0	4	2
8.	17GED01	Soft Skills-Listening and Speaking	EEC	NIL	2	0	0	2	0
TOTAL					29	17	4	8	22

SEMESTER: IV									
SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C
THEORY									
1.	17MYB07	Numerical Methods	BS	NIL	4	2	2	0	3
2.	17CEC07	Mechanics of Solids – II	ES	17CEC03	5	3	2	0	4
3.	17CEC08	Soil Mechanics#	PC	17CEC02	5	3	0	2	4
4.	17CEC09	Highway Engineering	PC	NIL	3	3	0	0	3
5.	17CEC10	Applied Hydraulics Engineering	PC	17CEC04	3	3	0	0	3
6.	17CEC11	Concrete Technology	PC	17CEC05	3	3	0	0	3
PRACTICALS									
7.	17CEP03	Building Drawing –II	ES	17CEP01	4	0	0	4	2
8.	17CEP04	Hydraulics Engineering Laboratory	PC	17CEC04	4	0	0	4	2
9.	17GED02	Soft Skills- Reading and Writing	EEC	NIL	2	0	0	2	0
10.	17GED03	Personality and Character Development	EEC	NIL	2	0	0	1	0
TOTAL					35	17	4	13	24




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SEMESTER: V									
SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C
THEORY									
1.	17CEC12	Structural Analysis – I	PC	17CEC07	5	3	2	0	4
2.	17CEC13	Design of Reinforced Concrete Elements	PC	NIL	5	3	2	0	4
3.	17CEC14	Foundation Engineering	PC	17CEC08	3	3	0	0	3
4.	17CEC15	Water Resources and Irrigation Engineering	PC	NIL	3	3	0	0	3
5.	E1	Elective - I (PSE)	PSE	--	3	3	0	0	3
6.	E2	Elective - II (PSE)	PSE	--	3	3	0	0	3
PRACTICALS									
7.	17CEP05	Concrete and Highway Engineering Laboratory	PC	17CEC11	4	0	0	4	2
8.	17CEP06	Employability Skills – I	EEC	NIL	2	0	0	2	0
9.	17GED07	Constitution of India	EEC	NIL	2	2	0	0	0
TOTAL					30	20	4	6	22

SEMESTER: VI									
SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C
THEORY									
1.	17CEC16	Structural Analysis – II	PC	17CEC12	5	3	2	0	4
2.	17CEC17	Design of Steel Structures	PC	17CEC03	5	3	2	0	4
3.	17CEC18	Design of Reinforced Concrete Structures	PC	17CEC13	3	3	0	0	3
4.	17CEC19	Environmental Engineering#	PC	NIL	5	3	0	2	4
5.	E3	Elective – III (PSE)	PSE	--	3	3	0	0	3
6.	E4	Elective – IV (PSE)	PSE	--	3	3	0	0	3
PRACTICALS									
7.	17CEP07	Design and Drawing Laboratory	PC	17CEC13	4	0	0	4	2
8.	17CEP08	Survey Camp*	PC	17CEC06	2	0	0	2	1
9.	17GED06	Comprehension	EEC	NIL	2	0	0	2	0
10.	17GED08	Essence of Indian Traditional Knowledge	EEC	NIL	2	2	0	0	0
TOTAL					34	20	4	10	24

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SEMESTER: VII									
SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C
THEORY									
1.	17CEC20	Estimating ,Costing and Valuation#	PC	17CEP07	5	3	0	2	4
2.	17CEC21	Construction Techniques, Equipment and Practice	PC	NIL	3	3	0	0	3
3.	E5	Elective - V (PSE)	PSE	--	3	3	0	0	3
4.	E6	Elective - VI (PSE/ OE)	PSE/OE	--	3	3	0	0	3
5.	E7	Elective - VII (OE)	OE	--	3	3	0	0	3
PRACTICALS									
6.	17CED01	Design Project	EEC	--	8	0	0	8	4
7.	17CEP09	Industrial Training**	EEC	NIL	2	0	0	2	0
8.	17CEP10	Employability Skills – II	EEC	--	2	0	0	2	0
TOTAL					29	15	0	14	20

SEMESTER: VIII									
SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C
THEORY									
1.	E8	Elective – VIII (PSE / OE)	PSE / OE	--	3	3	0	0	3
2.	E9	Elective – IX (OE)	OE	NIL	3	3	0	0	3
PRACTICALS									
3.	17CED02	Project Work	EEC	--	16	0	0	16	8
TOTAL					22	6	0	16	14

Theory cum Practical Component

*Ten Days Survey Camp will be conducted during 5th semester winter vacation

** Industrial Training to be undergone during 3rd to 6th Semester Vacation – Minimum of 15 days duration

TOTAL CREDITS: 24 + 23 + 22 + 24 + 22 + 24+ 20 + 14 = 173



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B.E. CIVIL ENGINEERING

(A) HS,BS, and ES Courses										
(a) Humanities and Social Sciences (HS)			Credit Distribution:12-14			AICTE Norm:5 to 10%				
S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17EYA01	Professional English-I	HS	NIL	4	2	0	2	3	I
2.	17GEP01	Personal Values	HS	NIL	2	0	0	2	0	I
3.	17EYA02	Professional English-II	HS	17EYA01	4	2	0	2	3	II
4.	17GEP02	Inter Personal Values	HS	17GEP01	2	0	0	2	0	II

(b) Basic Sciences (BS)										
(b) Basic Sciences (BS)			Credit Distribution:17-30			AICTE Norm:15 to 20%				
S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17MYB01	Calculus and Solid Geometry	BS	NIL	5	3	2	0	4	I
2.	17PYB01	Physics for Engineers	BS	NIL	3	3	0	0	3	I
3.	17CYB01	Applied Chemistry	BS	NIL	3	3	0	0	3	I
4.	17GYP01	Physics and Chemistry Laboratory	BS	NIL	4	0	0	4	2	I
5.	17MYB02	Complex Analysis and Laplace Transforms	BS	17MYB01	5	3	2	0	4	II
6.	17PYB03	Materials Physics	BS	17PYB01	3	3	0	0	3	II
7.	17CYB03	Environmental Science	BS	NIL	3	3	0	0	3	II
8.	17MYB03	Fourier Series and Partial Differential Equations	BS	NIL	4	2	2	0	3	III
9.	17MYB07	Numerical Methods	BS	NIL	3	2	2	0	3	IV

(c) Engineering Sciences (ES)										
(c) Engineering Sciences (ES)			Credit Distribution:17-30			AICTE Norm:15 to 20%				
S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17MEC01	Engineering Graphics	ES	NIL	4	2	2	0	3	I
2.	17CEC01	Fundamentals of Engineering Mechanics	ES	NIL	5	3	2	0	4	I
3.	17GYP02	Engineering Practices Laboratory	ES	NIL	4	0	0	4	2	I
4.	17EEC01	Basic Electrical and Electronics Engineering	ES	NIL	3	3	0	0	3	II
5.	17CSC01	Problem Solving and Python Programming	ES	NIL	3	3	0	0	3	II
6.	17CSP01	Problem Solving and Python Programming Laboratory	ES	NIL	4	0	0	4	2	II


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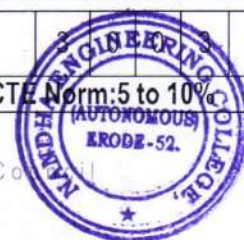
7.	17CEP01	Building Drawing –I	ES	NIL	4	0	0	4	2	II
8.	17CEC03	Mechanics of Solids- I	ES	17CEC01	5	3	2	0	4	III
9.	17CEC07	Mechanics of Solids- II	ES	17CEC03	5	3	2	0	4	IV
10.	17CEP03	Building Drawing – II	ES	17CEP01	4	0	0	4	2	IV

(B) Programme Core Courses (PC)			Credit Distribution:63-72		AICTE Norm:30 to 40%					
S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17CEC02	Engineering Geology	PC	NIL	3	3	0	0	3	III
2.	17CEC04	Mechanics of Fluids	PC	NIL	3	3	0	0	3	III
3.	17CEC05	Building Materials#	PC	NIL	3	3	0	2	4	III
4.	17CEC06	Surveying	PC	NIL	3	3	0	0	3	III
5.	17CEP02	Survey Laboratory	PC	NIL	4	0	0	4	2	III
6.	17CEC08	Soil Mechanics#	PC	17CEC02	5	3	0	2	4	IV
7.	17CEC09	Highway Engineering	PC	NIL	3	3	0	0	3	IV
8.	17CEC10	Applied Hydraulics Engineering	PC	17CEC04	3	3	0	0	3	IV
9.	17CEC11	Concrete Technology	PC	17CEC05	3	3	0	0	3	IV
10.	17CEP04	Hydraulics Engineering Laboratory	PC	17CEC04	4	0	0	4	2	IV
11.	17CEC12	Structural Analysis – I	PC	17CEC01	5	3	2	0	4	V
12.	17CEC13	Design of Reinforced Concrete Elements	PC	NIL	5	3	2	0	4	V
13.	17CEC14	Foundation Engineering	PC	17CEC08	3	3	0	0	3	V
14.	17CEC15	Water Resources and Irrigation Engineering	PC	NIL	3	3	0	0	3	V
15.	17CEP05	Concrete and Highway Engineering Laboratory	PC	17CEC11	4	0	0	4	2	V
16.	17CEC16	Structural Analysis – II	PC	17CEC12	5	3	2	0	4	V
17.	17CEC17	Design Steel Structures	PC	17CEC03	5	3	2	0	4	VI
18.	17CEC18	Design of Reinforced Concrete Structures	PC	17CEC13	3	3	0	0	3	V
19.	17CEC19	Environmental Engineering#	PC	NIL	5	3	0	2	4	VI
20.	17CEP07	Design and Drawing Laboratory	PC	17CEC13	4	0	0	4	2	VI
21.	17CEP08	Survey Camp	PC	17CEC06	2	0	0	2	1	VI
22.	17CEC20	Estimating, Costing and Valuation#	PC	17CEP07	5	3	0	2	4	VII
23.	17CEC21	Construction Techniques and Equipment Practice	PC	NIL	3	3	0	0	3	VII

(C) Elective Courses										
(a) Program Specific Electives(PSE)			Credit Distribution:18-20		AICTE Norm:10 to 15%					
S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17CEX01	Architecture and Town Planning	PSE.	--	3	0	0	0	3	V



2.	17CEX02	Remote Sensing and GIS Techniques	PSE	--	3	3	0	0	3	V, VI
3.	17CEX03	Construction Planning and Scheduling	PSE	--	3	3	0	0	3	V, VI, VII
4.	17CEX04	Traffic Engineering and Management	PSE	--	3	3	0	0	3	VI, VII
5.	17CEX05	Ground Improvement Techniques	PSE	--	3	3	0	0	3	VI, VII
6.	17CEX06	Housing Planning and Management	PSE	--	3	3	0	0	3	VII, VIII
7.	17CEX07	Railways, Airports and Harbour Engineering	PSE	--	3	3	0	0	3	IV, V, VI
8.	17CEX08	Green Buildings	PSE	--	3	3	0	0	3	VI, VII
9.	17CEX09	Smart Materials and Structures	PSE	--	3	3	0	0	3	V, VI, VII
10.	17CEX10	Industrial Waste Treatment and Disposal	PSE	--	3	3	0	0	3	V, VI
11.	17CEX11	Ground Water Engineering	PSE	--	3	3	0	0	3	VI, VII
12.	17CEX12	Solid Waste Management	PSE	--	3	3	0	0	3	VII, VIII
13.	17CEX13	Repair and Rehabilitation of Structures	PSE	--	3	3	0	0	3	VII, VIII
14.	17CEX14	Disaster Management and Mitigation	PSE	--	3	3	0	0	3	VI, VII
15.	17CEX15	Environmental Impact Assessment	PSE	--	3	3	0	0	3	V, VI
16.	17CEX16	Corrosion and its Control	PSE	--	3	3	0	0	3	VI
17.	17CEX17	Advanced Surveying Techniques	PSE	--	3	3	0	0	3	IV, V
18.	17CEX18	Digital Cadastre	PSE	--	3	3	0	0	3	VII
19.	17CEX19	Geoinformatics Applications for Civil Engineers	PSE	--	3	3	0	0	3	III, IV
20.	17CEX20	Pavement Engineering	PSE	--	3	3	0	0	3	IV, V
21.	17CEX21	Prestressed Concrete Structures	PSE	--	3	3	0	0	3	V, VII
22.	17CEX22	Computer Aided Design of Structures	PSE	--	3	3	0	0	3	VI, VII
23.	17CEX23	Prefabricated Structures	PSE	--	3	3	0	0	3	VI, VII
24.	17CEX24	Basics of Dynamics and Aseismic Design	PSE	--	3	3	0	0	3	VI, VII
25.	17CEX25	Principles of Computational Fluid Dynamics	PSE	--	3	3	0	0	3	V, VI
26.	17CEX26	Construction Safety	PSE	--	3	3	0	0	3	V, VI
26.	17GEA02	Principles of Management	PSE	--	3	3	0	0	3	VII
27.	17GEA03	Total Quality Management	PSE	--	3	3	0	0	3	V-VII
28.	17GEA04	Professional Ethics and Human Values	PSE	--	3	3	0	0	3	VI, VII
(b) (i) Open Electives		Credit Distribution:9-12			AICTE Norm:5 to 10%					



S. NO.	COURSE CODE	COURSE TITLE	CATEGORY		CONTACT PERIODS	L	T	P	C	P.S
1.	17AGZ01	Baking and Confectionery Technology	OE	-	3	3	0	0	3	VII
2.	17AGZ02	Food safety and quality control system	OE	-	3	3	0	0	3	VII
3.	17AGZ03	Farm Mechanization	OE	-	3	3	0	0	3	VIII
4.	17AGZ04	Processing of Fruits and Vegetables	OE	-	3	3	0	0	3	VIII
5.	17CHZ01	Waste Water Treatment	OE	-	3	3	0	0	3	VII
6.	17CHZ02	Piping Engineering	OE	-	3	3	0	0	3	VII
7.	17CHZ03	Process Automation	OE	-	3	3	0	0	3	VII
8.	17CHZ04	Process Instrumentation	OE	-	3	3	0	0	3	VII
9.	17CEZ01	Energy conservation in buildings	OE	-	3	3	0	0	3	VII
10.	17CEZ02	Air Pollution Management	OE	-	3	3	0	0	3	VIII
11.	17CEZ03	Building Services	OE	-	3	3	0	0	3	VIII
12.	17CEZ04	Road Safety Management	OE	-	3	3	0	0	3	VII
13.	17CEZ05	Waste Management	OE	-	3	3	0	0	3	VII/VIII
14.	17CSZ01	Design Thinking	OE	-	3	3	0	0	3	VII
15.	17CSZ02	Digital Marketing	OE	-	3	3	0	0	3	VII
16.	17CSZ03	Software Engineering	OE	-	3	3	0	0	3	VIII
17.	17CSZ04	Unified Functional Testing	OE	-	3	3	0	0	3	VIII
18.	17CSZ05	C Programming	OE	-	3	3	0	0	3	VI
19.	17CSZ06	Data Structures	OE	-	3	3	0	0	3	VI
20.	17ECZ01	Modern wireless communication system	OE	-	3	3	0	0	3	VII
21.	17ECZ02	Consumer Electronics	OE	-	3	3	0	0	3	VII
22.	17ECZ03	Automotive Electronics	OE	-	3	3	0	0	3	VIII
23.	17ECZ04	Electronic Testing	OE	-	3	3	0	0	3	VIII
24.	17EEZ01	Renewable Energy Technology	OE	-	3	3	0	0	3	VII
25.	17EEZ02	Smart Grid	OE	-	3	3	0	0	3	VII
26.	17EEZ03	Energy Auditing, Conservation and Management	OE	-	3	3	0	0	3	VIII
27.	17EEZ04	Electrical Machines	OE	-	3	3	0	0	3	VIII
28.	17EIZ01	Autotronic	OE	-	3	3	0	0	3	VII
29.	17EIZ02	Industrial Automation	OE	-	3	3	0	0	3	VII
30.	17EIZ03	Fiber Optic Sensors	OE	-	3	3	0	0	3	VIII
31.	17EIZ04	Ultrasonic Instrumentation	OE	-	3	3	0	0	3	VIII
32.	17ITZ01	Software Testing Tool	OE	-	3	3	0	0	3	VII
33.	17ITZ02	User Experience	OE	-	3	3	0	0	3	VII



34.	17ITZ03	Developing Mobile Apps	OE	-	3	3	0	0	3	VIII
35.	17ITZ04	Software Project Management	OE	-	3	3	0	0	3	VIII
36.	17ITZ05	Java Programming	OE	-	3	3	0	0	3	
37.	17MEZ01	Engineering Ergonomics	OE	-	3	3	0	0	3	VII / VIII
38.	17MEZ02	Energy Audit and Resource Management	OE	-	3	3	0	0	3	VII / VIII
39.	17MEZ03	Electric Vehicle Technology	OE	-	3	3	0	0	3	VII / VIII
40.	17MEZ04	Value Engineering	OE	-	3	3	0	0	3	VII / VIII
41.	17MEZ05	Smart Mobility	OE	-	3	3	0	0	3	VII / VIII
42.	17MEZ06	Smart Sensor Systems	OE	-	3	3	0	0	3	VII / VIII
43.	17MYZ01	Mathematical Structures	OE	-	3	3	0	0	3	VII
44.	17MYZ02	Optimization Techniques	OE	-	3	3	0	0	3	VII
45.	17MYZ03	Statics for Engineers	OE	-	3	3	0	0	3	VII
46.	17MYZ04	Statistics for Engineers	OE	-	3	3	0	0	3	VII
47.	17PYZ01	Nanomaterials	OE	-	3	3	0	0	3	VII
48.	17PYZ02	Nuclear physics and Reactors	OE	-	3	3	0	0	3	VII
49.	17PYZ03	Space science and technology	OE	-	3	3	0	0	3	VII
50.	17CYZ01	Chemistry for Every DayLife	OE	-	3	3	0	0	3	VII
51.	17CYZ02	E - Waste Management	OE	-	3	3	0	0	3	VII
52.	17CYZ03	Industrial Chemistry	OE	-	3	3	0	0	3	VII
53.	17EYZ01	Communicative Hindi	OE	-	3	3	0	0	3	VII
54.	17EYZ02	Fundamentals of German	OE	-	3	3	0	0	3	VII
55.	17EYZ03	Basics of Japanese	OE	-	3	3	0	0	3	VII
56.	17EYZ04	Employability Enhancement and Analytical Skills	OE	-	3	3	0	0	3	VII
57.	17EYX01	Effective Communication	OE	-	3	3	0	0	3	VII
58.	17GYZ01	Biology for Engineers	OE	-	3	3	0	0	3	VII
59.	17BMZ01	Health care technology	OE	-	3	3	0	0	3	VII
60.	17BMZ02	Telemedicine	OE	-	3	3	0	0	3	VII
61.	17BMZ03	Epidemiology and Pandemic Management	OE	-	3	3	0	0	3	VII
62.	17BMZ04	Medical Ethics	OE	-	3	3	0	0	3	VII

b (ii) Additional Open Electives for Civil Engineering Program										
Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	PRE-REQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17CSX31	Problem Solving and Programming	OE	-	3	3	0	0	3	

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2.	17ITX26	Problem Solving and Algorithmic Skills	OE	-	3	3	0	0	3	VVI
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(D) Project			Credit Distribution:20		AICTE Norm:10 to 15%					
S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17CED01	Design Project	EEC	NIL	8	0	0	8	4	VII
2.	17CED02	Project Work	EEC	NIL	16	0	0	16	8	VIII

(E) Skill / Proficiency based courses (Not to be included in CGPA)			Credit Distribution: Non-Credit		AICTE Norm:3%					
S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PREREQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17GED01	Soft Skills - Listening and Speaking	EEC	NIL	2	0	0	2	0	III
2.	17GED02	Soft Skills - Reading and Writing	EEC	NIL	1	0	0	2	0	IV
3.	17GED03	Personality and Character Development	EEC	NIL	2	0	0	1	0	IV
4.	17CEP06	Employability Skills – I	EEC	NIL	2	0	0	2	0	V
5.	17GED07	Constitution of India	EEC	NIL	2	2	0	0	0	V
6.	17GED06	Comprehension	EEC	NIL	2	0	0	2	0	VI
7.	17GED08	Essence of Indian Traditional Knowledge	EEC	NIL	2	2	0	0	0	VI
8.	17CEP09	Industrial Training **	EEC	NIL	2	0	0	2	0	VII
9.	17CEP10	Employability Skills – II	EEC	NIL	2	0	0	2	0	VII

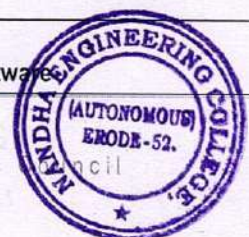
S. No.	SUBJECT AREA	CREDITS AS PER SEMESTER								CREDITS TOTAL
		I	II	III	IV	V	VI	VII	VIII	
1.	HS	3	3	4						10
2.	BS	12	10	3	3					28
3.	ES	9	10	4	6					29
4.	PC			11	15	16	18	7		67
5.	PSE					6	6	6	3	21
6.	OE							3	3	6
7.	EEC	-	-	-	-	-	-	4	8	12
CREDITS TOTAL		24	23	22	24	22	24	20	14	173



17MYB01 - CALCULUS AND SOLID GEOMETRY
(Common to All Branches)

		L	T	P	C
		3	2	0	4
PREREQUISITE : NIL			QUESTION PATTERN: TYPE - 4		
COURSE OBJECTIVES AND OUTCOMES:					
Course Objectives		Course Outcomes The students will be able to		Related Program outcomes	
1.0	To develop the use of matrix algebra techniques those are needed by engineers for practical applications.	1.1	Apply the concept of orthogonal reduction to diagonalise the given matrix.	a,b,c,e,g,i,k	
2.0	Use the techniques, Skills and Engineering tools necessary for engineering practice, with Geometric concepts.	2.1	Have knowledge about the geometrical aspects of sphere.	a,b,c,e,f,i,k	
3.0	To improve their ability in solving geometrical applications of differential calculus problems.	3.1	Find the radius of curvature, circle of curvature and centre of curvature for a given curve.	a,b,c,i,k	
4.0	To learn the important role of Mathematical concepts in engineering applications with the functions of several variables.	4.1	Classify the maxima and minima for a given function with several variables, through by finding stationary points.	a,b,c,d,k	
5.0	To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.	5.1	Demonstrate the use of double and triple integrals to compute area and volume.	a,b,c,d,f,i,k	

UNIT I - MATRICES	(9+6)
Characteristic Equation-Eigen values and Eigen vectors of a matrix –Properties(statement only)- Cayley Hamilton Theorem and its applications- Orthogonal transformation of a symmetric matrix to a diagonal form - Quadratic form-Reduction of a Quadratic form to canonical form by orthogonal transformation.	
UNIT II - ANALYTICAL GEOMETRY OF THREE DIMENSIONS	(9+6)
Equation of a Plane –Angle between two planes–Equation of straight lines-Coplanar lines- skew lines- Equation of a sphere – Orthogonal spheres.	
UNIT III - GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS	(9+6)
Curvature – Curvature in Cartesian co-ordinates-Centre and Radius of curvature-Circle of curvature–Evolutes and Involutives-Envelopes.	
UNIT IV - FUNCTIONS OF SEVERAL VARIABLES	(9+6)
Partial derivatives - Euler's theorem on homogeneous function-Jacobian-Maxima and Minima of functions of two variables-Constrained Maxima and Minima by Lagrange's multiplier method.	
UNIT V - MULTIPLE INTEGRALS	(9+6)
Double integration in Cartesian Co-ordinates-Change of order of integration-Area as double integral- Triple integration in Cartesian Co-ordinates-Volume as triple integrals.	
TOTAL (L: 45+T:30) = 75 PERIODS	
Note : Simulation of Engineering Problems (Qualitative Analysis) using open source software	



TEXT BOOKS:

1. Dr.B.S.Grewal, "Higher Engineering Mathematics", 42nd ed., Khanna publications, 2012.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 9th ed., John Wiley & sons, 2013.
3. Veerarajan.T, "Engineering Mathematics for Semester I & II ", 3rd ed., Tata McGraw Hill, 2014.

REFERENCES:

1. N.P.Bali, Manish Goyal, "A text book of Engineering Mathematics: Sem-II", 5th edi.,Laxmi Publications.2011.
2. Kandasamy .P, Thilagavathy .K , Gunavathy .K , "Engineering Mathematics for first Year", 9th Rv. Ed., S.Chand & Co Ltd, 2013.
3. Glyn James, "Advanced Engineering Mathematics", 7th ed., Wiley India, 2007.



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17CYB01 - APPLIED CHEMISTRY
(Common to MECH, CIVIL, AGRI & CHEMICAL ENGG. Branches)

L	T	P	C
3	0	0	3

PREREQUISITE : NIL

QUESTION PATTERN: TYPE - 3

COURSE OBJECTIVES AND OUTCOMES

Course Objectives		Course Outcomes The students will be able to		Related Program outcomes
1.0	To understand the principles of water characterization and treatment methods.	1.1	Apply knowledge of fundamental principles of chemistry	a,c
2.0	To introduce the basic concepts of electrode potential and batteries	2.1	Define and solve engineering problems, including the utilization of creative and innovative skills	a,b,c,g
3.0	To understand the principles and applications of corrosion	3.1	Gain practical experience with chemical process equipment as well as to analyze and interpret data	b,e
4.0	To gain knowledge on engineering materials and industrial importance of fuels and combustion	4.1	Understand the impact of engineering solutions in a global, economic, environmental and societal content	c,d,f,g
5.0	To understand the concept of various analytical techniques	5.1	Understand the concept of engineering materials	a,b,d,f,g, h

UNIT I - WATER TECHNOLOGY	(9)
Hardness - types - estimation by EDTA method - Domestic water treatment - disinfection methods (chlorination, ozonation and UV treatment) - Boiler troubles (scale, sludge, priming, foaming and caustic embrittlement) - Internal conditioning(carbonate, phosphate and calgon) - External conditioning - demineralization process - desalination - reverse osmosis method.	
UNIT II - ELECTROCHEMISTRY	(9)
Electrochemistry - electrode potential - Nernst equation and problems - Reference electrode - standard hydrogen electrode - calomel electrode - potentiometric titration (redox) - conductometric titration (strong acid – strong base) - Batteries - types - lead acid battery – fuel cell – hydrogen and oxygen fuel cell.	
UNIT III - CORROSION SCIENCE	(9)
Corrosion - definition – types - chemical and electrochemical corrosion (mechanism) – Galvanic corrosion – Differential aeration corrosion - Pitting corrosion – Factors influencing corrosion- Corrosion control - sacrificial anode method.	
UNIT IV - FUELS AND COMBUSTION	(9)
Fuels -Solid fuels - coal - proximate analysis - metallurgical coke - manufacture by Otto-Hoffmann method - Liquid fuels - synthetic petrol - Fischer Tropsch and Bergius processes - knocking - octane number - cetane number - Gaseous fuels - water gas - producer gas - Combustion - flue gas analysis - Orsat apparatus.	
UNIT V - ANALYTICAL TECHNIQUES	(9)
Colorimetry - principles – estimation of Iron by colorimetry – UV-Visible spectroscopy – principles - instrumentation (block diagram only) - IR spectroscopy – principles - instrumentation (block diagram only) - Flame Photometry – principles - instrumentation (block diagram only) - estimation of sodium by flame photometry – Atomic absorption spectroscopy – principles - instrumentation (block diagram only) - estimation of nickel by atomic absorption spectroscopy.	
TOTAL (L:45) PERIODS	


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TEXT BOOKS:

1. P.C. Jain and Monica Jain, "Engineering Chemistry", Vol I & II, Dhanpat Rai Pub, Co., New Delhi, 15th ed., 2013.
2. Dr. Ravikrishnan. A, "Engineering chemistry I & Engineering Chemistry II, Sri Krishna Hitech Publishing chem Co. Pvt Ltd., 13th ed., Chennai, 2014.

REFERENCES:

1. S.S. Dara, "A Text book of Engineering Chemistry", S.Chand & Co. Ltd., New Delhi, 2014.
2. N. Krishna murthy, D. Vallinayagam, "Engineering chemistry" PHI Learning Pvt Ltd., 2014.
3. B. Sivasankar, "Engineering Chemistry", Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 2012.



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17MYB02 - COMPLEX ANALYSIS AND LAPLACE TRANSFORMS
(Common to All branches)

	L	T	P	C
	3	2	0	4

PREREQUISITE : 17MYB01

QUESTION PATTERN : TYPE - 4

COURSE OBJECTIVES AND OUTCOMES:

Course Objectives		Course Outcomes The students will be able to		Related Program outcomes
1.0	To expose the concepts of differential equations.	1.1	Predict the suitable method to solve second and higher order differential equations.	a,b,c,d,f,i,k
2.0	To communicate the problem solutions using correct Mathematical terminology of vector calculus.	2.1	Apply the concepts of Differentiation and Integration to Vectors.	a,b,c,f,g,k
3.0	Apply rigorous and analytic approach to analyse the conformal mapping.	3.1	Compute an analytic function, when its real or imaginary part is known.	a,b,c,d,e,i,k
4.0	Acquiring the knowledge of evaluating contour integrals using residue theorem.	4.1	Identify the Singularities and its corresponding Residues for the given function.	a,b,c,d,e,k
5.0	Apply the concepts of Laplace transforms & its applications to various problems related to Engineering.	5.1	Predict a suitable method to evaluate the Contour integration.	a,b,c,d,e,f,i,k

UNIT I - ORDINARY DIFFERENTIAL EQUATIONS

(9+6)

Higher order linear differential equations with constant coefficients - method of variation of parameters - Cauchy's and Legendre's linear equations

UNIT II - VECTOR CALCULUS

(9+6)

Gradient and Directional derivative -Divergence and Curl – Irrotational,solenoidal and scalar potential –Line integral over a plane curve-Surface Integral and Volume Integral-Green's theorem in a plane-Gauss divergence theorem and Stokes Theorem (Excluding Proofs) -Simple Applications Involving Square, Rectangles, Cube and Parallelopiped.

UNIT III- ANALYTIC FUNCTIONS

(9+6)

Functions of a complex variable-Analytic functions- Necessary and sufficient conditions of Cauchy's -Riemann Equations in Cartesian Coordinates (Excluding Proofs) – Properties of Analytic Functions – Harmonic conjugate – Construction of an analytic function by Milne's Thomson Method- Conformal mapping : $w = c+z$, cz , $1/z$ and Bilinear Transformation.

UNIT IV - COMPLEX INTEGRATION

(9+6)

Statement and Simple applications of Cauchy's integral theorem and Cauchy's integral formula(Excluding Proofs) – Taylor's and Laurent's Series Expansions - Singularities - Residues – Cauchy's Residue theorem (Statement only) – Evaluation of contour integration over unit circle and semi circle (Excluding poles on Real axis).

UNIT V- LAPLACE TRANSFORM

(9+6)

Condition for existence - Transforms of Elementary functions –Basic Properties- First & Second Shifting Theorems (Statement only) –Transforms of derivatives and integrals- Transform of periodic functions - Initial and Final value Theorems. Inverse Laplace transforms -Convolution theorem (Statement only) –Solution of linear second order Ordinary differential equations with constant coefficients using Laplace transforms.

TOTAL (L: 45+T:30) = 75 PERIODS



Note : Simulation of Engineering Problems (Qualitative Analysis) using open source software


TEXTBOOKS:

1. Dr.B.S.Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna publications, 2012
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Edition, John Wiley and sons, 2013
3. Veerarajan.T, "Engineering Mathematics for Semester I and II", 3rd Edition, Tata McGraw Hill, 2014

REFERENCES:

1. N.P.Bali and Manish Goyal, "A text book of Engineering Mathematics : Semester-II", 5th Edition, Laxmi Publications, 2011
2. Kandasamy .P, Thilagavathy .K and Gunavathy .K, "Engineering Mathematics for first Year", 9th Rv. Ed., S.Chand and Co Ltd, 2013
3. Glyn James, "Advanced Engineering Mathematics", 7th Edition, Wiley India, 2007



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17MYB03 - FOURIER SERIES AND PARTIAL DIFFERENTIAL EQUATIONS

(Common to BE - MECH / CIVIL / CHEMICAL / AGRI)

		L	T	P	C
		2	2	0	3
PREREQUISITE : NIL			QUESTION PATTERN : TYPE – 4		
COURSE OBJECTIVES AND OUTCOMES					
Course Objectives		Course Outcomes The students will be able to			Related Program outcomes
1.0	To acquire knowledge to solve half range Fourier series and harmonic analysis.	1.1	Ability to have fundamental understanding of Fourier series and give Fourier expansions of a given function.	a,b,c,d,k,l	
2.0	To understand the concept of Fourier transforms and enhance the problem solving skill.	2.1	Apply transform techniques to solve engineering problems.	a,b,c,f,g	
3.0	To introduce how to solve linear partial differential equations with different methods.	3.1	Analyze and simulate the first and second order linear partial differential equations.	a,b,c,i,k,l	
4.0	To get the analytical solution for second and higher order homogeneous linear PDE's.	4.1	Demonstrate a firm understanding of the solution techniques for homogeneous linear PDE's.	a,b,c,d,e,l	
5.0	To solve different forms of wave and heat equations.	5.1	Ability to apply partial differential techniques to solve the physical engineering problems.	a,b,c,d,k	

UNIT I - FOURIER SERIES	(6+6)
Dirichlet's conditions - Fourier series: Half range sine series - Half range cosine series - Parseval's identity for half range series - Root-Mean square value of a function - Harmonic Analysis (π , degree and T- forms).	
UNIT II - FOURIER TRANSFORMS	(6+6)
Fourier integral theorem (statement only) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem.	
UNIT III - FIRST ORDER NON LINEAR PARTIAL DIFFERENTIAL EQUATIONS	(6+6)
Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions - Solution of standard types of first order partial differential equations: (i) $f(p,q)=0$, (ii) Clairaut's type, (iii) $f(z,p,q) = 0$, (iv) $f(x,p) = g(y,q)$.	
UNIT IV - LINEAR PARTIAL DIFFERENTIAL EQUATIONS	(6+6)
General solution of Lagrange's linear equation $Pp+Qq = R$ - Solutions of simultaneous equations $dx/P=dy/Q = dz/R$ by the method of grouping & method of multipliers-Homogeneous linear partial differential equations of second and higher order with constant coefficients (R.H.S = 0, e^{ax+by} , $\cos(ax+by)$, $\sin(ax+by)$, $x^m y^n$).	
UNIT V - APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS	(6+6)
Classification of second order quasi linear partial differential equations - Solutions of one dimensional wave equation(zero and Non-zero Boundary conditions) - One dimensional heat equation(Reduced to zero & non zero temperature)- Steady state solution of two dimensional heat equation (Finite and infinite plate).	
TOTAL (L: 30+T:30) = 60 PERIODS	



TEXT BOOKS:

1. Veerarajan,T. " Transforms and Partial Differential Equations", 2nded., Tata Mc Graw Hill, New Delhi, Second reprint, 2015.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics; Volume III", S. Chand & Co Ltd., 2008.

REFERENCES:

1. Goyal. Manish and Bali, N.P, "A Textbook of Engineering mathematics", 6th ed., Laxmi Publication (P) Ltd. New Delhi, 2012.
2. Grewal, B.S. "Higher Engineering Mathematics", 42nded. Khanna publishers, New Delhi, 2012.
3. Kreyszig, Erwin. "Advanced Engineering Mathematics", 9th ed., Wiley Publications, New Delhi, 2006.



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17CEC05 – BUILDING MATERIALS					
		L	T	P	C
		3	0	2	4
PREREQUISITE : NIL			QUESTION PATTERN: TYPE -3		
COURSE OBJECTIVES AND OUTCOMES					
Course Objectives		Course Outcomes			Related Program outcomes
		The students will be able to			
1.0	To have a clear knowledge of building materials and their properties.	1.1	Compare the properties of most common and advanced building materials.	e,I	
2.0	To get idea on joineries and plumbing materials.	2.1	Understand the applications of glass, timbers and other materials	a,b,e	
3.0	To learn the criteria for choice of the appropriate material and	3.1	Know the types and application of joineries and plumbing materials	a,e,I	
4.0	To conduct the various tests for assessing the strength and quality of materials.	4.1	Get idea on roofing and flooring materials	a,e,I	
5.0	To apply the theoretical knowledge to practical problems.	5.1	Understand the importance of modern material for construction.	a,e,I	

UNIT I - BRICKS AND CONCRETE BLOCKS	(9)
Bricks – Classification – Manufacturing of clay bricks – Tests on bricks – Compressive Strength – Water Absorption – Efflorescence – Bricks for special use – Refractory bricks – Cement, brick and Concrete hollow blocks – Light weight concrete blocks (AAC).	
UNIT II - GLASS, TIMBER AND OTHER MATERIALS	(9)
Glass - Types and its application - Timber – Market forms – Industrial timber– Plywood – Veneer – False ceiling materials – Panels of laminates – Steel – Aluminum and Other Metallic Materials – Composition – Aluminium composite panel – Uses – Market forms – Mechanical treatment – Paints – Varnishes – Distempers – Bitumens.	
UNIT III - JOINERIES AND PLUMBING	(10)
Doors – Types – Based on materials – Wood, UPVC, Glazed, Fiber reinforced plastic, Steel, Puff, Flush, Aluminium - Based on usage – Pocket, Bi-fold, Sliding, Accordion – Based on manufacturing process - Battened and Ledged Doors, Framed and Panelled Doors, Battened, Ledged and Braced Doors, Flush Doors, Louvered Doors.	
Windows – Types - Based on materials – Wood, UPVC, Steel, Glass, Aluminium - Based on usage – Fixed, Sliding, Casement, Hopper, Single hung, Awing, Bay, Bow.	
Plumbing – Types of pipes and its application – Specials – Tee, Elbow, cap, reducer, union, FTA, Y, Nani trap, Q-trap, S-trap, Cowel - Basic plumbing fitting, types and its applications – Water closets, Taps, wash basins, Health Faucet, bib cock, angle valve.	
UNIT IV - FLOORING AND ROOFING MATERIALS	(8)
Flooring – Types of Flooring – Materials Used and its source, properties and application – Granite, Marble, Vitrified and ceramic Tile, Kota stone, Mandana – Grano, Epoxy flooring - Roofing Material – Physical descriptions of asbestos sheets, GI sheets, tubes and light weight roofing materials	



UNIT V- MODERN CONSTRUCTION MATERIALS	(9)
<p>Structural Steel and Aluminium -- Modern materials – Neoprene, thermocole, decorative panels and laminates, architectural glass and ceramics, ferrocement, PVC, polymer base materials, fibre reinforced plastics – Grouting materials - Sealants for joints - Composite materials - Types – Applications of laminar composites – Fibre textiles – Geomembranes and Geotextiles for earth reinforcement - colour coated sheets, insulated wall panels</p>	
<p>LIST OF EXPERIMENTS:</p> <ol style="list-style-type: none"> 1. Determination of tension on mild steel rod. 2. Determination of Double shear on mild steel. 3. Finding out Torsional value of mild steel rod. 4. Determination of Compression strength on timber. 5. Determination of Compression strength on bricks, 6. Determination of Izod and Charpy impact test on metal specimens. 7. Finding out the Rockwell Hardness Number on metal Specimens. 8. Finding out the Brinell hardness test on metal Specimens. 9. Finding out the Deflection values on metal beam on various tests. 10. Determination of Elastic properties of open coiled and close coiled helical springs 	
TOTAL (L: 45 : P:30) = 75 PERIODS	
<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Varghese.P.C, "Building Materials", PHI Learning Pvt. Ltd, New Delhi, 2012. 2. Rangwala.S.C, "Engineering Materials", Charotar Publishing House, New Delhi 2014. 3. Duggal.S.K., "Building Materials", 4th ed., New Age International, 2008 	
<p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Rajput.R.K, "Engineering Materials", S. Chand & Company Ltd., 2011. 2. Gambhir. M.L., and Neha Jamwal., "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012. 3. Bindra and Arora, "Building Materials and Construction", Dhanpat Rai & Sons, New Delhi, 1998 	





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17CEC06 – SURVEYING

				L	T	P	C
				3	0	0	3
PREREQUISITE : NIL				QUESTION PATTERN: TYPE -3			
COURSE OBJECTIVES AND OUTCOMES							
Course Objectives		Course Outcomes				Related Program outcomes	
		The students will be able to					
1.0	Understand the concepts of different types of surveying and the procedures for carrying out the survey works.	1.1	Remember the basics of surveying and different methods of surveying.			a,b,l	
2.0	To know about contouring works for construction Purposes.	2.1	Understand the contouring and leveling concepts			a,c,d,g	
3.0	To study the different surveying equipment in the field of civil engineering.	3.1	Understanding the fundamental function, use of Theodolite and tacheometry in practical applications.			a,b,e,l	
4.0	To measure the height and distance by Theodolite	4.1	Get idea about route surveying			a,c,d	
5.0	To get introduced to modern surveying equipment's and its techniques	5.1	Get exposure on advance surveying such as total Station.			b,d,e,l	

UNIT I - HISTORY AND TRADITIONAL METHODS OF SURVEYING	(9)
Definition - Principles - Classification - Conventional signs - Survey instruments - well conditioned triangles - Traversing - Plane table instruments and accessories - Compass - Types - Bearing - weighted observations - Principle of least squares.	
UNIT II - CONTOUR AND LEVELLING	(11)
Level line - Horizontal line - Levels and Staves - Bench marks -Temporary and permanent adjustments - Fly and check Levelling - Reciprocal leveling - Longitudinal and cross sections – Contouring and its characteristics - solve problems by using height of collimation and rise and fall method - Calculation of areas and volumes.	
UNIT III -THEODOLITE SURVEYING	(9)
Theodolite - Horizontal angles - Vertical angles - Heights and distances - Tachometric surveying - Tachometric systems - Tangential, stadia - Stadia systems – Horizontal and inclined sights - Vertical and normal staffing - Fixed and movable hairs - Stadia Constants Traversing - Closing error and distribution - Omitted measurements.	
UNIT IV - ROUTE SURVEY AND HYDROGRAPHIC SURVEY	(7)
Reconnaissance, Preliminary and location surveys for engineering projects - Hydrographic Surveying - Tides - MSL – Sounding & its methods.	
UNIT V - TOTAL STATION	(9)
Introduction- Accuracy of a Total Station- Accessories for Total Station- Functions Performed by Total Stations- Applications of Total Station- Remote Elevation Measurement (REM)- Missing Line Measurement (MLM)- Area Calculation- Setting out	
TOTAL (L : 45) = 45 PERIODS	


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TEXT BOOKS:

1. Punmia.B.C. Ashok K. Jain and Arun K. Jain, "Surveying, Vols.I, II and III", 16th ed.,Laxmi Publications, New Delhi, 2005
2. Duggal R.K, "Surveying", Vol. I & II, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2004.

REFERENCES:

1. Kanetkar.T.P "Surveying and Levelling", Vols. I and II, United Book Corporation, Pune, 1994.



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17CEC10 - APPLIED HYDRAULICS ENGINEERING

L	T	P	C
3	0	0	3

PREREQUISITE : 17CEC04

QUESTION PATTERN : TYPE -3

COURSE OBJECTIVES AND OUTCOMES

Course Objectives		Course Outcomes		Related Program outcomes
		The students will be able to		
1.0	To relate the theory and practice of problems in hydraulic engineering.	1.1	Apply their knowledge of fluid mechanics in addressing problems in open channels.	a,b,l
2.0	To introduce various hydraulic engineering problems like open channel flows and flow characteristics	2.1	Able to identify a effective section for flow in different cross sections	b,k
3.0	To understand the concept of hydraulic jumps and surges.	3.1	Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.	a,b,c,l
4.0	To understand the concepts and performance characteristics of flow through turbines.	4.1	Understand the principles, working and application of turbines	a,e,g,l
5.0	To study the classification, performance characteristics and design aspects of pumps.	5.1	Understand the principles, working and application of pumps.	a,e,l

UNIT I - UNIFORM FLOW

(9)

Definition and differences between pipe flow and open channel flow - Types of Flow - Properties of open channel - Velocity distribution in open channel - Steady uniform flow: Chezy equation, Manning equation - Best hydraulic sections for uniform flow – Wide open channel - Specific energy and specific force – Critical flow

UNIT II - GRADUALLY VARIED FLOW

(9)

Dynamic equations of gradually varied flows – Types of flow profiles - Classifications: Computation by Direct step method and Standard step method – Control section – Break in Grade – Computation

UNIT III - RAPIDLY VARIED FLOW

(9)

Application of the momentum equation for RVF - Hydraulic jumps - Types - Energy dissipation – Celerity – Rapidly varied unsteady flows (positive and negative surges)

UNIT IV – TURBINES

(9)

Impact of Jet on flat, curved plates, Stationary and Moving –Classification of Turbines – Pelton wheel – Francis turbine – Kaplan turbine - Specific speed – Characteristic Curves of Turbines- Draft tube and cavitation.

UNIT V – PUMPS

(9)

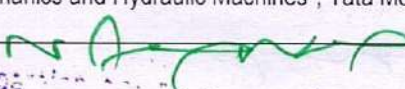
Classification of Pumps - Centrifugal pumps – Work done - Minimum speed to start the pump - NPSH - Multistage pumps – Characteristics curve - Reciprocating pumps - Negative slip - Indicator diagrams and its variations – Air vessels - Savings in work done.

TOTAL (L: 45) = 45 PERIODS

TEXT BOOKS:

1. Bansal.R.K "Fluid Mechanics and Hydraulic Machines", 9th revised ed., Laxmi Publications, New Delhi, Reprint 2015.
2. Subramanya.K, "Flow in open channels", Tata McGraw Hill, New Delhi, 2000.
3. Subramanya.K., " Fluid Mechanics and Hydraulic Machines", Tata McGraw Hill Education Private Limited, New Delhi, 2010.

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REFERENCES:

1. V.T.Chow, "Open Channel Hydraulics", Blackburn Press, Caldwell United States, 2009.
2. Modi P.N and Seth.S.M "Hydraulics and Fluid Mechanics including Hydraulic Machines", Standard Book House New Delhi, 2009.
3. Jain.A.K., " Fluid Mechanics" (Including Hydraulic Machines), Khanna Publishers, 12th ed., 2016



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17CEC15 - WATER RESOURCES AND IRRIGATION ENGINEERING

	L	T	P	C
	3	0	0	3

PREREQUISITE : NIL

QUESTION PATTERN : TYPE-3

COURSE OBJECTIVES AND OUTCOMES

Course Objectives		Course Outcomes		Related Program outcomes
		The students will be able to		
1.0	To emphasize the need for water resources planning	1.1	Get exposure about the developments of water resources.	g,k
2.0	To emphasis the need and importance of Irrigation	2.1	Assess the irrigation needs of crops	c,e,g,i
3.0	To impart required knowledge on hydraulic design of different structures and the concept of maintenance	3.1	Study about different types of structures for irrigation	c,e,l
4.0	To provide training on design of impounding structures	4.1	Implement various types of irrigation methods	c,d,g
5.0	To realize the importance of participatory irrigation management	5.1	Plan for water management and minimize irrigation water losses	g,k

UNIT I - INTRODUCTION OF WATER RESOURCES

(9)

Water resources survey – Description of water resources planning - Estimation of water requirements for irrigation and drinking - Single and multipurpose reservoir. Flood - levees and flood walls. Concept of basin as a unit for development - Water budget - Conjunctive use of surface and ground water.

UNIT II - INTRODUCTION OF IRRIGATION ENGINEERING

(9)

Irrigation - Need and mode of irrigation - Merits and demerits of irrigation - Crop and crop seasons –consumptive use of water - Duty - Factors affecting duty - Irrigation efficiencies - Planning and Development of irrigation projects.

UNIT III - CANAL IRRIGATION

(9)

Gravity dam - Diversion Head works - Alignment of canals - Classification of canals - Canal drops - Cross drainage works - Canal Head works - Canal regulators - River Training works.

UNIT IV - IRRIGATION METHODS

(9)

Lift irrigation - Canal irrigation - Tank irrigation - Flooding methods - Sprinkler irrigation - Drip irrigation. Well irrigation - Irrigation methods: Surface and Sub-Surface and Micro Irrigation - Merits and demerits

UNIT V - IRRIGATION WATER MANAGEMENT

(9)

Need for optimization of water use – Minimising irrigation water losses – On farm development works -Participatory irrigation management – Water users associations

TOTAL (L:45) = 45 PERIODS

TEXT BOOKS:

1. Garg S. K., "Irrigation Engineering and Hydraulic structures", Khanna Publishers, 23rd Revised Edition, New Delhi, 2009
2. Punmia B.C. and Pande B.B. .Lal Irrigation and Water Power Engineering, Laxmi Publishing, New Delhi, 2007
3. Michael, A.M, Irrigation Theory and Practical, Vikas Publishing Pvt Ltd, 2006
4. Gupta, B.L, and Amir Gupta, "Irrigation Engineering", Satya Prahesan, New Delhi, 2007

REFERENCES:

1. Dilip Kumar Majumdar, "Irrigation Water Management (Principles and Practices)", Prentice Hall of India (P), Ltd, 2000
2. Basak, N.N, "Irrigation Engineering", Tata McGraw-Hill Publishing Co. New Delhi, 1999
3. Sharma R.K. "Irrigation Engineering", S.Chand and Co. 2007.



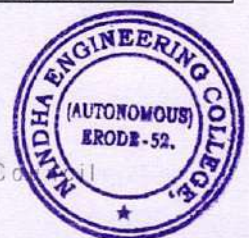
17CEC12 - STRUCTURAL ANALYSIS – I

		L	T	P	C
		3	2	0	4
PREREQUISITE : 17CEC07			QUESTION PATTERN : TYPE – 4		
COURSE OBJECTIVES AND OUTCOMES					
Course Objectives		Course Outcomes			Related Program outcomes
		The students will be able to			
1.0	To introduce the basic concepts of structural analysis and the classical methods for the analysis of buildings.	1.1	Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames	a,b,c	
2.0	To analyse the structures for internal forces by theorem of three moments and slope deflection method.	2.1	Analyse the continuous beams and portal frames by slope deflection method.	a,b,c	
3.0	To analyse the structures for internal forces by Moment distribution method.	3.1	Understand the concept of moment distribution method.	a,b	
4.0	To analyse the indeterminate structures and settlement of supports	4.1	Analyse the beams and support by kani's method.	a,b	
5.0	To understand an influence lines for statically determinate and indeterminate beams.	5.1	Draw the influence lines for statically determinate and indeterminate structures	b,c	

UNIT I - PIN JOINTED FRAME	(9+6)
Degree of static and kinematic indeterminacies of plane frames - analysis of indeterminate pin-jointed frames - rigid frames (Degree of static indeterminacy upto two). Principles of virtual work for deflections - Deflections of pin jointed plane frames and rigid frames.	
UNIT II - SLOPE DEFLECTION METHOD	(9+6)
Slope deflection method - analysis of continuous beams and portal frames (with and without sway) - bending moment and shear force diagram.	
UNIT III - MOMENT DISTRIBUTION METHOD	(9+6)
Moment distribution method - analysis of continuous beams and portal frames (with and without sway) - bending moment and shear force diagram.	
UNIT IV - ENERGY METHOD	(9+6)
Kani's Method - Analysis of Indeterminate Structures - Settlement of Supports (with and without sway)	
UNIT V - INFLUENCE LINES	(9+6)
Influence line - influence lines for bending moment and shear force, Muller Breslau's - principle, determinate and indeterminate beams.	
TOTAL (L: 45+ T:30) = 75 PERIODS	
TEXT BOOKS:	
1. Vaidyanathan, R and Perumal, P., "Comprehensive Structural Analysis," Volume I and II, Laxmi Publications Pvt. Ltd., Chennai, 4 th ed., 2016.	
2. Subrata Chakarabarty, Sujit Kumar Roy., "Fundamentals of Structural Analysis", S.Chand & Company Ltd, New Delhi, 2012.	
REFERENCES:	
1. Punmia, B.C., Ashok Kumar Jain, Arun Kumar Jain., "Theory of Structures", Laxmi Publications, New Delhi, 2015.	
2. S.S.Bhavikatti, "Structural Analysis" – Vol.I& II, Vikas Publishing Pvt Ltd., New Delhi, 4 th ed.,2013.	
3. Wang, C.K., "Analysis of Indeterminate Structures", Tata McGraw-Hill, New Delhi, 2000.	
4. Negi, L.S. and Jangid, R.S., "Structural Analysis", Tata McGraw-Hill Publications, New Delhi, 2004.	



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**17CEC14 - FOUNDATION ENGINEERING
(IS 6403 code book is to be permitted)**

		L	T	P	C
		3	0	0	3
PREREQUISITE : 17CEC08			QUESTION PATTERN : TYPE- 4		
COURSE OBJECTIVES AND OUTCOMES					
Course Objectives		Course Outcomes		Related Program outcomes	
		The students will be able to			
1.0	To impart knowledge for plan and execute a detail site investigation programme	1.1	Understand the importance of soil investigation in various civil Engineering projects	b,e	
2.0	To explain the concepts related to bearing capacity and settlement for various types of soils and loading conditions.	2.1	Estimate bearing capacity incorporating IS codal provisions.	a,b,l	
3.0	To select geotechnical design parameters and type of foundations	3.1	Do proper foundation proportioning for any kind of shallow foundation system and get exposure in foundation analysis.	a,d,j,l	
4.0	To discuss different types of pile foundation and its capacity	4.1	Estimate pile and pile group capacity, group efficiency for various types of soils	a,b,c,e,g,l	
5.0	To study various earth pressure theories	5.1	Analysis earth retaining structures for various soil conditions	a,g,l	

UNIT I - SOIL INVESTIGATION AND CHOICE OF FOUNDATION	(7)
Methods of Soil Exploration - Boring - Sampling - Disturbed and undisturbed Sampling - Sampling techniques - Bore log and soil investigation report - Function and requirements of good foundation - Choice of foundation based on soil conditions.	
UNIT II - BEARING CAPACITY AND SETTLEMENT	(9)
Location and depth of foundations - Bearing capacity of shallow foundations on homogeneous deposit - Terzaghi's Theory - IS Code method - Problems - Field tests (SPT and SCPT) - Factors influencing Bearing Capacity - Settlement of foundations - Components of settlement - Allowable and maximum differential settlement.	
UNIT III - SHALLOW FOUNDATION	(9)
Types of footings - Contact pressure distribution: isolated footing - combined footings - proportioning - Mat foundation - Types and applications - Floating foundation.	
UNIT IV - PILE FOUNDATION	(9)
Need for deep foundations -Types of piles - classification of piles – Load carrying capacity of piles in granular and cohesive soils - Static and Dynamic formulae - Pile carrying capacity by field tests - Pile load test - Group Capacity - Settlement of Pile groups - Negative skin friction.	
UNIT V - STABILITY OF SLOPES AND EARTH PRESSURE	(11)
Slopes – Infinite and finite slopes - types of failure - causes of failure - Procedure for slip circle method - Earth pressure in soils: active and passive states - Lateral earth pressure - Rankine's theory - Cullman's Graphical method - Stabilization of soil using various methods.	
TOTAL (L:45) = 45 PERIODS	

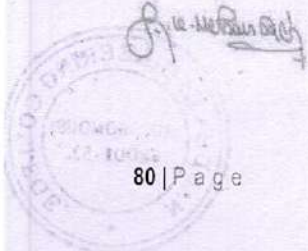
TEXT BOOKS:

1. Dr. K. R. Arora., "Soil Mechanics and Foundation Engineering", Standard Publisher, New Delhi, 2017.
2. Venkataramaiah.C, "Geotechnical Engineering", New Age International Ltd., New Delhi, 2008.



REFERENCES:

1. Varghese P.C., "Foundation Engineering", Prentice Hall of India, 2012.
2. Alam Singh., "Modern Geotechnical Engineering", IBS Publications, New Delhi, 2012.
3. Punmia. B. C., "Soil Mechanics and Foundation Engineering", Laxmi Publications, New Delhi, 16th ed., 2005.
4. Gopal Ranjan and Rao, "Basic and Applied Soil Mechanics", New Age International Pvt Ltd, New Delhi, 2002
5. IS 6403 - 1981, "Code of Practice for Determination of Bearing Capacity of Shallow Foundation", Bureau of Indian Standards, New Delhi.



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17CEP05 - CONCRETE AND HIGHWAY ENGINEERING LABORATORY

L	T	P	C
0	0	4	2

PREREQUISITE : 17CEC11

COURSE OBJECTIVES AND OUTCOMES

Course Objectives		Course Outcomes The students will be able to		Related Program outcomes
1.0	To provide an opportunity to learn how to measure the parameters which governs the quality of the materials	1.1	Evaluate the various properties of cement and concrete.	b,j,l
2.0	To learn the tests on hardened concrete and how the different materials shall modify the performance of concrete.	2.1	Diagnose the properties of aggregates with different testing methods	b,j,l
3.0	To find the properties of constituent materials and fresh concrete	3.1	Ensure the strength characteristics of the given concrete	a,b,k,l
4.0	To study the various tests carried out on aggregates	4.1	Prepare different concrete mixes and check the workability properties	a,b,l
5.0	To learn the principles and procedures of testing of highway materials	5.1	Gain sufficient idea on practice and procedure of using bitumen in road works	b,l

LIST OF EXPERIMENTS:

1. TEST ON CEMENT

- a. Fineness Test
- b. Consistency Test
- c. Initial and Final Setting Time Test
- d. Soundness Test

2. TEST ON FINE AGGREGATE

- a. Specific Gravity
- b. Fineness Modulus

3. TEST ON COARSE AGGREGATE

- a. Specific Gravity
- b. Water Absorption Test
- c. Impact Strength Test
- d. Crushing Strength Test
- e. Abrasion and Attrition Test

4. TEST ON FRESH CONCRETE


- a. Slump Test
- b. Vee-Bee Test
- c. Compaction Factor Test
- d. Flow table

5. TEST ON HARDENED CONCRETE

- a. Test on Cubes (Compressive Strength Test)
- b. Test on Cylinders (Split Tensile Strength)
- c. Test on Prisms (Flexural Strength of Concrete)

6. NON -DESTRUCTIVE TESTS

- a. Rebound Hammer Test
- b. Ultrasonic Pulse Velocity Test


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7. TESTS ON BITUMEN

- a. Penetration test
- b. Ductility test
- c. Marshal Stability and Flow Values (Study Experiment)

TOTAL (P: 60) = 60 PERIODS

REFERNCES:

- 1. Shetty. M. S, "Concrete Technology", Published by S. Chand & Co., Ltd, New Delhi, 2010.
- 2. IS: 10262 - 2009, Indian Standard specification for Methods of Mix design.
- 3. IS: 383 - 1987, Indian Standard specification for Test for Fine and Coarse aggregates from natural source for concrete.
- 4. IS: 1203 to 1208 - 1978, Indian Standard specification for Bitumen test



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17CEC18 - DESIGN OF REINFORCED CONCRETE STRUCTURES
[IS 456, SP 16 and IS 3370 Code Books are to be permitted]

L	T	P	C
3	0	0	3

PREREQUISITE : 17CEC13

QUESTION PATTERN : TYPE -4

COURSE OBJECTIVES AND OUTCOMES

Course Objectives		Course Outcomes The students will be able to		Related Program outcomes
1.0	To understand the basic concepts in the behavior and design of earth retaining structures.	1.1	Design counterfort and cantilever retaining walls.	a,b,c,g,l
2.0	To provide knowledge on design of various components in the water tank.	2.1	Design underground and overhead R.C water tanks for the given capacity	a,c,l
3.0	To provide knowledge on design of flat slab and raft foundations.	3.1	Design flat slabs as per IS standards	a,b,c,g,l
4.0	To explain the basic concepts about the yield line theory for the analysis and design of slab.	4.1	Analyze and design various types of slabs using yield line theory.	a,b,c,g,l
5.0	To design the slender column and industrial structures	5.1	Design columns for axial, uniaxial and biaxial bending and industrial structures	a,b,c,d,g,l

UNIT I - RETAINING WALLS

(9)

Functions of a Retaining Wall - Design of Cantilever and Counterfort Retaining walls

UNIT II - WATER TANKS

(9)

Design principles of elevated overhead water tank - Design of rectangular underground water tank - Design of circular overhead water tank

UNIT III - FLAT SLABS

(9)

Design of flat slabs (Problems) - Principles of design of Raft foundation, box culvert and road bridges

UNIT IV - YIELD LINE THEORY

(9)

Assumptions - Characteristics of yield line - Determination of collapse load / plastic moment - Application of virtual work method - square, rectangular, circular and triangular slabs - Design problems

UNIT V - SLENDER COLUMN AND INDUSTRIAL STRUCTURES

(9)

Design of Slender columns - Design for Uniaxial and Biaxial bending using Column Curves (Problems) - Bunkers - Basic Concepts - Silos - Design Principles

TOTAL (L: 45) = 45 PERIODS

TEXT BOOKS:

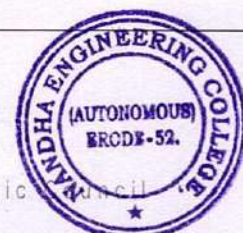
1. Krishnaraju. N., "Design of reinforced Concrete Structures", CBS Publishers and Distributors Pvt Ltd, 4th ed., 2015.
2. Punmia B.C, Ashok Kumar Jain, Arun K.Jain, "R.C.C. Designs Reinforced Concrete Structures", Laxmi Publications Pvt. Ltd., New Delhi, 2006.
3. Varghese.P.C., "Advanced Reinforced Concrete Design", Prentice Hall of India Pvt. Ltd., New Delhi, 2012.

REFERENCES:

1. Ram Chandra.N and Virendra Gehlot, "Limit State Design", Standard Book House, 2004.
2. Gambhir.M.L., "Design of Reinforced Concrete Structures", Prentice Hall of India Private Limited, 2012
3. Subramanian. N., "Design of Reinforced Concrete Structures", Oxford University, New Delhi, 2013.
4. IS 456:2000, Code of Practice for Plain and Reinforced Concrete, Bureau of Indian Standards, New Delhi, 2007
5. SP 16:1980, Design Aids for Reinforced Concrete, Bureau of Indian Standards, New Delhi.
6. IS 3370 (Part I & II):2009, Concrete Structures for Storage of Liquids - Code of Practice, Bureau of Indian Standards, New Delhi.




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17CEP08 – SURVEY CAMP

L	T	P	C
0	0	2	1

PREREQUISITE : 17CEC06

COURSE OBJECTIVES AND OUTCOMES

Course Objectives		Course Outcomes The students will be able to		Related Program outcomes
1.0	To make give practical exposure on the application of various basic principles of survey in the field.	1.1	Conduct various types of surveys in the field as per the requirements	c,e,g,l
2.0	To practically apply various simple surveying techniques, both in field and construction industries	2.1	Conduct survey using Advanced Instruments	b,d,e,g,l
3.0	To measure and draw the longitudinal and cross sectioning	3.1	Prepare contour map for the given area.	d,e,f,l
4.0	To measure the horizontal and vertical angles for triangulation work	4.1	Apply the procedures involved in field work and to work as a surveying team.	c,f,g,i,l
5.0	To provide hands on experience to handle modern surveying equipments using total station	5.1	Calculate the distances and angles of an object using advanced Instruments	c,e,l,l

LIST OF EXPERIMENTS:

Ten days survey camp using theodolite, leveling and total station. At the end of the camp, each student shall have plot the contour map and calculate the area. The camp record shall include all original field observations, calculations and plots.

1. Triangulation
2. Trilateration
3. Contouring
4. Co-ordinates and distance measurement with GPS
5. Distance and angular measurement using Total Station
6. Layout Preparation of field using Total Station
7. Setting out works using Total Station

(Ten Days Survey Camp will be conducted during 5th Semester winter vacation)

TOTAL (P: 30) = 30 PERIODS



		L	T	P	C
		0	0	2	0
PREREQUISITE : NIL					
COURSE OBJECTIVES AND OUTCOMES					
Course Objectives		Course Outcomes			Related Program outcomes
		The students will be able to			
1.0	To encourage the students to comprehend the knowledge acquired from the first Semester to Sixth Semester of B.E Degree Course through periodic exercise.	1.1	Understand and comprehend any given problem related to Civil Engineering field.	a,b,e,g,i	
2.0	To improve the skill of designing various problems related to Civil Engineering	2.1	Recall the fundamentals of Civil Engineering and Summarize the concepts of Codal provisions	a,b,i	

Engineering Mechanics: System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Friction and its applications; Kinematics of point mass and rigid body; Centre of mass; Euler's equations of motion; Supports and Reactions.

Mechanics of Solids: Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Theories of failures; Simple bending theory, flexural and shear stresses, Uniform torsion, buckling of column, combined and direct bending stresses.

Structural Analysis: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

Construction Materials: Structural steel - composition, material properties and behaviour; Concrete - constituents, mix design, Bricks and mortar; Timber; Bitumen.

Soil Mechanics: Origin of soils, Three-phase system and phase relationships, index properties; Indian standard soil classification system; Permeability Darcy's law; flow nets, Principle of effective stress, quicksand condition; Compaction in laboratory and field conditions; One- dimensional consolidation, Mohr's circle.

Foundation Engineering: Sub-surface investigations, Plate load test, standard penetration and cone penetration tests; Rankine Earth pressure theory; Stability of slopes - Stress distribution in soils - Boussinesq's, Pressure bulbs; Shallow foundations - Terzaghi's bearing capacity theories,; Combined footing and raft foundation; Contact pressure; Deep foundations - types of piles, dynamic and static formulae, pile load test, negative skin friction.

Fluid Mechanics: Properties of fluids, fluid statics; Continuity, momentum, energy and corresponding equations; applications of momentum and energy equations; Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth.

Surveying: Principles of surveying; Distance and angle measurement - Levelling, Contouring, Total station.

Hydraulics: Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Kinematics of flow, velocity triangles; Basics of hydraulic machines, specific speed of pumps and turbines; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, slope profile, hydraulic jump, uniform flow and gradually varied flow.

Highway Pavements: Highway materials - desirable properties and quality control tests; Design factors for flexible and rigid pavements; Design of flexible pavement and rigid pavements.

Water and Waste Water: Sources and quality of water, water treatment, Primary Waste Water Treatment, Secondary Waste Water Treatment, Disposal of sewage and sludge.

Concrete Structures: Working stress, Limit state and Ultimate load design concepts; Design of beams, slabs, columns; Bond and development length.

Steel Structures: Limit state design concepts; Design of tension and compression members, beams and beam-columns, column bases; Connections - simple and eccentric, beam-column connections, plate girders and trusses.



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METHOD OF EVALUATION:

The student will be assessed for his understanding of the basic principles of the core engineering subjects. The internal assessment for a total of 50 marks will be evaluated by a committee comprising of the faculty members of the department. The committee will conduct three written examinations of objective question type from the subjects. The end semester examination, which carries a total of 50 marks, will be an objective question type examination conducted by a committee of one internal examiner appointed by the COE of our college.

TOTAL(P:30)=30 PERIODS**REFERENCES:**

1. R.S.Khurmi, J.K.Gupta, "Civil Engineering (Conventional and ObjectiveType)", Eurasia Publishing House Pvt.Ltd, New Delhi, 2013.
2. R.Agor,"Conventional and Objective Type Questions and Answers on Civil Engineering", Khanna Publishers, 32nd ed., 2000.



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17CEX23 – PREFABRICATED STRUCTURES					
		L	T	P	C
		3	0	0	3
PREREQUISITE : NIL			QUESTION PATTERN : TYPE-4		
COURSE OBJECTIVES AND OUTCOMES					
Course Objectives		Course Outcomes The students will be able to		Related Program outcomes	
1.0	To explain the basic principles involved in prefabrication	1.1	Apply the principles and systems of prefabrication in the field.	c,e	
2.0	To study the behavior of structural Components	2.1	Identify suitable prefabricated components for specific use.	c,e,l	
3.0	To impart knowledge on prefabricated elements and the technologies used for fabrication and erection	3.1	Understand the design principles of fabrication	b,d,e,l	
4.0	To impart knowledge on the applications of prefabricated elements in construction	4.1	Classify the structural connections	c,e,g	
5.0	To gain knowledge about the modern trends in building construction, role of prefabricated structures and the basic functional requirements of industrial structures.	5.1	Utilize the various code provisions regarding progressive collapse.	c,e,l	

UNIT I - INTRODUCTION	(9)
Need for prefabrication – Principles of prefabrication – Modular coordination – Standardization – Materials – Systems – Production – Transportation – Erection.	
UNIT II - PREFABRICATED COMPONENTS	(9)
Behaviour and types of structural components – Large panel systems – roof and floor slabs – Walls panels - Beams - Columns - Shear walls.	
UNIT III - DESIGN PRINCIPLES	(9)
Design philosophy- Design of cross section based on efficiency of material used – Problems in design because of joint flexibility – Allowance for joint deformation - Demountable precast concrete systems.	
UNIT IV - JOINTS AND CONNECTIONS IN STRUCTURAL MEMBERS	(9)
Types of Joints – based on action of forces - compression joints - shear joints - tension joints - based on function - construction, contraction, expansion. Design of expansion joints - Dimensions and detailing - Types of sealants - Types of structural connections - Beam to Column - Column to Column - Beam to Beam - Column to foundation	
UNIT V - DESIGN FOR ABNORMAL LOADS	(9)
Progressive collapse – Codal provisions – Equivalent design loads for considering abnormal effects such as earthquakes, cyclones, etc., - Importance of avoidance of progressive collapse.	
TOTAL (L: 45) = 45 PERIODS	
TEXT BOOKS:	
1. L. Mokk, Prefabricated Concrete for Industrial and Public Structures, Publishing House of the Hungarian Academy of Sciences, Budapest, 2007.	
2. Bruggeling A.S. G and Huyghe G.F. "Prefabrication with Concrete", A.A. Balkema Publishers, USA, 1991.	
3. Lewitt, M. " Precast Concrete- Materials, Manufacture, Properties And Usage", Applied Science Publishers , London And New Jersey, 1982.	
4. Bachmann, H. and Steinle, A. "Precast Concrete Structures", Ernst & Sohn, Berlin, 2011	

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1. B. Lewicki, Building with Large Prefabricates, Elsevier Publishing Company, Amsterdam, London, New York, 1998
2. Handbook on Precast Concrete Buildings", Indian Concrete Institute, 2016.
3. "Structural design manual", Precast concrete connection details, Society for the studies in the use of precast concrete, Netherland Beton Verlag, 2009

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