	2,000			er	Usef
	nit-126)	11)61('. Butterworth-Heinemann, 4th Edition 20	T.H.G. Megson	3.
		2,6)	"Structural Analysis-II", Vikas Publishing House 5th Edition, 2021 (Unit-2,6)	Bhavikatti S.S.,	2.
			on 11th edition,2023 (Unit-3,4,5,6)	-	1.
				Reference Books	Refe
	4, Unit 6)	Unit 4,	"Structural Analysis", Alpha Science Intl, Ltd., 2nd Edition, 2008 (Unit 3,	Devdas Menon,	2.
	Unit 5)	it 2,	cGraw Hill, 3rd Edition, 2017 (Unit 1, Uni	Reddy C.S., "B;	
				Text Books	Text
			ly determinate bridge trusses.	moment, ILD for member forces in statically determinate bridge trusses	
		ding	for support reaction, shear force and bend	compound beams, Influence line diagrams for support reaction, shear force and bending	
(0/)	04	and	Principle and its application to statically determinate simple	Muller- Breslau's	(
(04)	CO3		nethod	Unit 6 Influence I in a Diagrams	
			and it diss.		
		first	eciprocal Deflections—Betti's law - the i	done by a force on an member-Law of Reciprocal Deflections—Betti's law - the first theorem of Castioliano-deflection of beam and truss	
		vork	- strain energy stored due to bending- w	Strain energy stored due to axial loading - strain energy stored due to bending- work	
(07)	CO3			Unit 4 Energy principles in structural Analysis:	Uni
		n.	antilever with uniform section, fixed beam	Consistent deformation method: propped cantilever with uniform section, fixed beam.	
			0 1	with different flexural rigidities.	
		eam	1 continuous beam, sinking of support, be	Clapeyeron's theorem of three moments in continuous beam, sinking of support, beam	
(0)	205	i i	and and	redundancy, Methods of ar	
(00)	CO3	hiral	nacy. Degrees of freedom and structural	Unit 3 Concept of determinacy and indeterminacy. Degrees	Uni
			kine's theory	Analysis of long columns, Euler's and Rankine's theory	
(0.0)				method, Macaulay's method, moment are	
(07)	C02	tion	in determinate beams - Double integration	e and deflections	Uni
		Carre			
(00)	201	vity	stresses, eccentric loads stability analysis of gravity	Combined direct and bending	
(06)	601			Unit 1 Direct and Bending Stresses:	Uni
Hours	60		Course Contents	Course	
	trusses.	minate	ams (ILDs) for beams and statically detern	CO4 Construct and interpret Influence Line Diagrams (ILDs) for beams and statically determinate trusses.	CO
	Sis.	lanaly	on method and force methods in structural	CO3 Evaluate strain energy, Consistent deformation method and force methods in structural analysis	CO
		10ds.	n of determinate beams with various meth-	CO2 Analyse and compute the slope and deflection of determinate beams with various methods	CO
			stability analysis of gravity dams.	CO1 Determine combined stresses for column and stability analysis of gravity dams	CO
				Course Outcomes (CO): Students will be able to	Cou
				Prerequisite: Mechanics of Material	Pres
	S	03 Hrs	Duration of ESE		
		60	ESE	Total Credits 03	Tota
		20	ISE	Tutorials 00 Hrs/week	Tuto
		20	MSE	Lectures 03 Hrs/week	Lect
		me	Examination Scheme	Teaching Scheme	Tea
			CE3501: Structural Wechanics	CE3501: 2	
			V) B. Tech. Civil Engineering	Third Year (Sem -	
			- Jess	Covernment Co	
			Home of Francisco Transfer	Correment	





-	1. https://archive.nptel.ac.in/courses/105/105/105105166/?utm_source=chatgpt.com PROF. AMIT SHAW
	Department of Civil Engineering, IIT Kharagpur
2.	2. https://archive.nptel.ac.in/courses/105/101/105101085/?utm_source=chatgpt.com IIT Bombay
3.	3. https://www.youtube.com/watch?v=oa5ojjGEUSw&list=PLUogGZJOiMtNOus85Tq1zNvg9EU3aJ8VO&index=1.
	PROF. AMIT SHAW, Department of Civil Engineering, IIT Kharagpur

CO 4	CO 3	CO2	CO 1	СО↓	↓	PO
1	1	1	2			PO I
1	2	3	2			PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9
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•					10	PO
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Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

Create 5 4
5 4 10



			Government College of Engineering, Karad	g, Karad			
			Third Year (Sem -V) B. Tech. Civil Engineering	Ingineering			
			CE3502 :Building Planning and Design	Design			
Leaching Scheme	Scher	ne		Examination Scheme	e		
Tutalis		OO III-S/WEEK		(1	20		
Total Credits		03		ESE 6	00		
				Duration of ESE 0	02 Hrs 30 Min) Min	
Prerequisite:		Basic Civil Engi	Basic Civil Engineering, Building material knowledge				
Course (Jutcom	les (CO): Stude	Course Outcomes (CO): Students will be able to				
C01 E	Explain	the fundamental	Explain the fundamental principles of building planning, identify various components of buildings	arious components of bu	ildings		
C02 I	dentify	and evaluate dif	Identify and evaluate different construction materials and finishing services used in building construction.	services used in building	g constru	action.	
C03 [Demons	trate the functio	Demonstrate the functional requirements and methods of application for various building services, including	on for various building se	ervices, i	ncludi	ng
q	dumbin	g, electrical, and	plumbing, electrical, and HVAC systems.				
C04 [Describe	e the principles a	Describe the principles and practices involved in the maintenance of structures.	of structures.			
			Course Contents		C	CO	Hours
Unit 1	Compo	Components of Building Basic requirements of a	Components of Building Basic requirements of a building as a whole: strength and stability. Dimensional stability.	lity. Dimensional stabili		CO1,	(07)
	comfo	rt and convenier	comfort and convenience, damp prevention, water-proofing techniques, heat insulation, day	niques, heat insulation, d			
	Buildi	Building components	and their uses: Foundations plinth	walls and columns	3.		
	superstr	tructure, floors,	_	s, steps and stairs, util	ity		
	Found	ations: Types an	Foundations: Types and their suitability				
Unit 2	Compo	onents of Buildingtion to Stone r	Components of Building and designing Introduction to Stone masonry – Random Rubble Un-coursed Bubble Coursed Bubble and	ihhle Coursed Buhhle o		CO2	(07)
	Ashlar	Ashlar Masonry.		acces, contract vincole a			
	Bricky	vork and Brick I	Brickwork and Brick Bonds - English, Flemish.				
	Arche:	s: Technical tern	Arches: Technical terms in arches, types of arches, methods of construction.	onstruction.			
	Stairs:	Technical terms	Stairs: Technical terms, types, Design of stairs, Ramps, lifts and escalator.	escalator.			
T	Roots	and floor: types	Roots and floor: types and their suitability				
Unit 3	Water	Introduction to construction mainter Water proofing: materials, methods	Introduction to construction maintenance and Water proofing. Repairs, Maintenance Water proofing: materials, methods	pairs, Maintenance	C	C04	(06)
	Introd	uction to sustain	Introduction to sustainability and green building: Introduction to sustainable materials and	sustainable materials a	nd		
	the co	the concept of green	the concept of green building, comparison between conventional building and green building and its rating systems	ional building and gre	en		
Unit 4	Buildi	Building Planning	S were no result of owner		0	CO2.	(06)
	Buildi	ng Planning Bye	Building Planning Byelaws and regulations as per SP-7.			CO3	(
	Planni	ng of Resident	Planning of Residential Building (Bungalows, Row Bungalows, Apartments and Twin	vs, Apartments and Tv			
	bunga	lows), Procedur Completion cert	Bungalows), Procedure of Building Permission, significance of commencement certificates, plinth Completion certificate and occupancy certificate	ommencement certificat	es,		
Unit 5	Buildi	Building Services	company continue.		2	603	(07)
	Plumb	ing system: Var	Plumbing system: Various types of traps and plumbing systems, Fittings, Chambers,	, Fittings, Chambers, Need		CO4	(0.1)
	of Sep	tic Tank, Conce	of Septic Tank, Concept of Plumbing and Drainage plan				
	points	points, Concept of Earthing.	Earthing.	and pocation of various	· S		
	Fire r	Fire resistance in building:	lding: Fire protection precautions, confining of fire, fire hazards	ning of fire, fire hazar	ds sb.		





	Functions of Indian Patent Office as Receiving Office, Computer related Patent Applications		
Unit 6	Building Ventilation and Finishing Ventilation: requirement, various system and section criteria.	CO1,	(07)
	Thermal Insulation: - General concept, Materials, Methods.	(
	Introduction to Acoustics: Absorption of sound, various materials, conditions for good		
	acoustics. Sound Insulation and modern techniques of noise control		
	Plastring- Types, defects and Methods, Pointing- Types; Paints- Ingredients and types		
Text	Text Books		
1.	R. Shah, S. Kale, and P. Patk, Building Design. New Delhi, India: Tata McGraw-Hill, 2015. (Unit 1, 2,4,6)	, 2,4,6)	
2.	S. P. Bindra and V. Arora, Building Design. New Delhi, India: S. Chand, 2008. (Unit 1,2,3,5,6)		
3.	D. Chowdhari, Building Construction and Materials. New Delhi, India: Dhanpat Rai Publications, 2014. (All	2014. (A	=
	Units)		
Refe	Reference Books		
1.	Bureau of Indian Standards, National Building Code SP-7, 2005. (Unit 1,2)		
2.	Technical Teacher's Training Institute, Chandigarh, Civil Engineering Materials. (Unit 2,3)		
3.	B. C. Punmia, A. K. Jain, and A. K. Jain, Building Construction. (All Units)		
4.	S. C. Rangwala, Building Construction. (All Units)		
5.	S. S. Bhavikatti, Building Materials and Construction. (Unit 1,3,4)		
•			
Usefi	Useful Links		
1.	https://easyengineering.net/building-materials-duggal/ (Unit1 ,2,3)		

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Guideline for Assessment Pattern(with revised Bloom's Taxonomy)

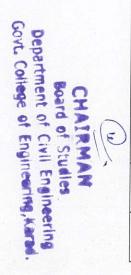
Knowledge Level Remember Understand Apply Analyse Evaluate Create	MSE	1SE 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	
Remember	5	4	
Understand	5	4	
Apply	5	4	
Analyse	1	4	
Evaluate	5	4	
Create	1	1	
TOTAL	20	20	





		Unit 5	Unit 4	Unit 3	Unit 2			C04 U				Course (Prerequ		Total Credits	Tutorials	Lectures	Teachin			
development of airport in India, factors affecting selection of site for airport, important components of airport layout, Windrose diagram, aircraft characteristics, types of	track alignment - requirements & factors controlling, track geometrics - negative cant, coning of wheels, points and crossing, track maintenance - defects in rails and corrective measures, PWI, railway signaling, future trends in rail transport. Introduction to Airport engineering:	100			Traffic Engineering: Traffic characteristics, traffic engi of service of rural and urban r pavement markings and signals, intersections and traffic islands, hi of lighting system		11	Understand the fundamental concepts and key terminologies of railway engineering and tunnel engineering	Suggest appropriate highway materials, construction methodologies, and maintenance techniques	Apply traffic engineering knowledge to analyze traffic characteristics, design intersections, signals, and assess highway capacity.	Understand highway planning, road development programs, and geometric design of highways and railways	Course Outcomes (CO): Students will be able to	Prerequisite: Basic knowledge of building construction materials and transportation fundamentals		Credits 03	ils 00 Hrs/week	es 03 Hrs/week	Teaching Scheme	CE3503: Tran	Third Year (Sem - 1	Government Coll
factors affecting selection of site for airport, Windrose diagram, aircraft characteristics,	controlling, track geon maintenance - defects define in rail transport.	onents of track & their	ace, types of pavements le pavement (IRC 37: s of DPR – work activi	ction: on highway materials and inghway materials on highway materials on — methods, MoRTH, on — methods, MoRTH, on — types way maintenance - types ures, highway drainage ures, highway drainage ingineering, Introduction itigating risks in construction	udies - types, PCU, high fic regulation and con gnal design by Webst hting - importance, facto	idia - NHAI, NHDP, Pats , highway alignment ent and types, horizon nsition curves and their	Course Contents	terminologies of railwa	uction methodologies, a	ze traffic characteristics	ent programs, and geom		on materials and transpo						CE3503: Transportation Engineering	V) B. Tech. Civil Engineering	Government College of Engineering, Karad
for airport, important racteristics, types of	netrics - negative cant, in rails and corrective	requirements, gauges	, components and their 2012), design of rigid ties, quantity executed, records.	and selection criterion, practices, components of failures in flexible - need, types, recent n to Risk Management uction and engineering	neering studies - types, PCU, highway capacity and level oads, traffic regulation and control measures - signs, traffic signal design by Webster's method, types of ghway lighting - importance, factors affecting and design	MGSY, MSRDC, road t - factors governing it, tal alignment - design ir significance, vertical		y engineering and tunne	nd maintenance techniqu	s, design intersections, s	etric design of highways		rtation fundamentals	tion of ESE		ISE 20	MSE 20	Examination Scheme	ad .	ineering	Karad
	* ;	C04	C03	C03	COZ	COI	СО	l engineer	ues	ignals, an	s and raily			02 Hrs 30 Min							
	4	(07)	(05)	(07)	(07)	(08)	Hours	ing		d assess	vays			7							





Text Books 1. Justo C. E. G., Khanna S. K., Veeraragavan A., "Highway Engineering", Nemchand & Bros (10th Edition). 2015. 2. Kadiyali L. R. and Lal N. B., "Principles and Practices of Highway Engineering", Khanna Publishers (7 th Edition). 2013. (Unit 1,3,4) 3. Kadiyali L. R., "Traffic Engineering and Transport Planning", Khanna Publishers, (9 th Edition). 2013. (Unit 4,5) 4. Satish Chandra, Agarwal M. M., "Railway Engineering", Oxford University Press, (2 nd Edition). 2013. (Unit 5) 5. Saxena S. C., "Tunnel Engineering", Dhanpat Rai & Sons. 2013. (Unit 6) Reference Books 7. Kadiyali L. R., "Transportation Engineering", Khanna Publishers. 2016. (Unit 4,5) 8. Wright P. H. and Dixon K., "Highway Engineering", Imperial College Press, (2 nd Edition). 2005. (Unit 5) 9. Urift P. Bonnett, "Practical Railway Engineering", Imperial College Press, (2 nd Edition). 2009. (All Units) 9. Urity P. and Das A., "Principles of Transportation Engineering", PHI Learning Pvt. Ltd., (7 th Edition). 2009. (All Units) 9. Chakroborty P. and Das A., "Principles of Transportation Engineering", PHI Learning Pvt. Ltd., (2 nd Edition). 2003. (All Units) 9. Brockenbrough R. L. and Boedecker K. J., "Highway Engineering", Cengage Learning, (4 th Edition). 2009. (All Units) 10. Garber N. J. and Hoel L. A., "Traffic and Highway Engineering", Tata McGraw Hill. 2000. (Unit 2,3,4) 11. Units 12. https://nptel.ac.in/courses/105/105/105/105/105/105/204 Introduction to multi-modal transport — Prof. Arkopal Kishore Coswami, IIT Kharagpur. (Unit 1,2) 13. https://nptel.ac.in/courses/105/106/105/105/200/ — Characterization of Construction Materials — Prof. Pyush Chan. IIT Kharagpur. (Unit 2) 14. https://nptel.ac.in/courses/105/106/105/105/105/05/ — Mechanical Characterization of Bituminous Materials — Multi — Prof. Arkopal Kishore Chancel Characterization of Bituminous Materials — Multi — Prof. Pyush Prof. Pyush Prof. Prof. Pyush Prof. Prof. Pyush Prof.
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Text Books
Classification of tunnels, tunnel surveying, methods of tunnelling in soft rock, methods of tunnelling hard rock, tunnel lining, tunnel drainage, ventilation in tunnels - methods, tunnel lighting, tunnel hazards, recent trends in tunnelling.



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CO 4	CO3	CO 2	CO 1	CO↓	1	PO
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1: Slight (Low)

2: Moderate (Medium)

3: Substantial (High)

Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

TOTAL 20	Create -	Evaluate 5	Analyse -	Apply 6	Understand 4	Remember 5	Knowledge Level MSE
20		3	3	6	. 4	4	SE ISE
60	1	10	20	10	1	20	ESE



		Main	uctures: Primary Members /	on Plastic Analysis Method and Limit State Approach, Introduction to Pre-engineered Building (PEB) str	
(07)	C04	based	Hinge Formation, Collapse Mechanism, Recent approaches in Steel Structure design based	Hinge Formation, Collapse Mechani	
(07)	CO2	ion to	Gantry girder: Forces acting on a gantry girder, commonly used sections, introduction to design of gantry girder as laterally unsupported beam, connection details, Roof trusses: Components of an industrial shed, types of trusses, load calculations and combinations, design of truss members, design of purlins, design of bracing.	Gantry girder design of gant Roof trusses: combinations,	
(06)	C03	using ry and	Laterally supported & unsupported beams, design of simple beams, built up beams using flange plates, curtailment of flange plates, web buckling & web crippling, secondary and main beam arrangement, beam to beam connections.	Laterally supported & unsupported beams, design flange plates, curtailment of flange plates, web but main beam arrangement, beam to beam connections. Their 5 Booffee Sections	
(06)	CO3	battening entric load	Design of columns subjected to axial and eccentric loading, design of lacing, battening system, column splices, Column bases: Design of slab bases & gusseted base subjected to axial and eccentric load and design of concrete pedestal.		: .
(07)	C02	àilure, ension ed and	Tension and Compression Members: Behavior of tension and compression member, common sections, net area, modes of failure, effective length, slenderness ratio, load carrying capacity, design of axially loaded tension members, design of compression members, and design of end connections (bolted and welded).		
(07)	COI	f steel ctures, rically	Introduction to Design of Steel Structures & Connections: Design philosophy, comparison of LSM & WSM, advantages and disadvantages of steel structures, types of steel structures, grades of structural steel, various rolled steel structures, loads and load combinations, partial safety factors for load and materials, Connections: Types of bolts & welds, analysis and design of axially and eccentrically loaded bolted and welded connections (subjected to bending and torsion).	Unit 1 Introduction to Design of Steel Structures & Connections: Design philosophy, comparison of LSM & WSM, advantages and disa structures, types of steel structures, grades of structural steel, various roll loads and load combinations, partial safety factors for load and materials, Connections: Types of bolts & welds, analysis and design of axially loaded bolted and welded connections (subjected to bending and torsion).	
Hours	СО		Course Contents		
IS code	as per l	nditions res.	Examine steel column and beam and its built-up sections for different loading conditions as per provisions. Discuss recent approaches for steel structure design as plastic analysis and PEB structures.	CO3 Examine steel column and beam an provisions. CO4 Discuss recent approaches for steel str	0 0
	e Design.	mit Stat	Design analytically tension and compression members along with roofing system by Limit State Design.		0
			to	COI Analyze and design the voices connection	3 0
			s of Materials.	Prerequisite: Engineering Mechanics, Mechanics of Materials.	7
1	03 Hrs 00 Min	03 H	ESE Duration of ESE	10tal Credits 03	1
		20	ISE		1 7
		20	MSE	Lectures 03 Hrs/week	Le
		heme	Examination Scheme	Teaching Scheme	1
			CE3504 : Design of Steel Structure	CE35	
			nester – V) B. Tech. Civil Engineering	Third Year (Semester -	
			Government College of Engineering, Karad	Governme	





 IS 875:1987 Part I, II, III IS Handbook Steel Table 			1. IS 800:2007, In	Codes	Madras	1. http://nptel.ac.ii	Useful Links	3. Shah V. L., Gor	2. Steel Construct	1. IS: 800 – 2007,	Reference Books	4. Sairam K. S., "	3. Shiyekar M. R.	2019.	2. Duggal S. K.,	1. Subramanian N	Text Books	Frames, Se	
	teel Table	IS 875:1987 Part I, II, III Indian standard Code	IS 800:2007, Indian standard Code		Madras Madras	http://nptel.ac.in/courses/105106112/ - Civil Engineering - Design of Steel Structures I - Satish Kumar, IIT		Shah V. L., Gore V., "Limit State Design of Steel Structures IS: 800 – 2007", Structures Publication, Pune. 2012.	Steel Construction Manual, AISC, (15th Edition). 2017.	IS: 800 – 2007, IS: 875 (Part I, II and III), SP 6 (1) & SP 6 (6), IS: 808-1989.		Sairam K. S., "Design of Steel Structures", Pearson Education India, (2nd Edition). 2013.	Shiyekar M. R., "Limit State Design in Structural Steel", PHI Publications. (3rd Edition). 2011.		Duggal S. K., "Limit State Design of Steel Structures", McGraw Hill Education (India) Pvt Ltd. (3rd Edition).	Subramanian N., "Design of Steel Structures - Limit State Method", Oxford University Press, New Delhi. 2015		Frames, Secondary Members / Cold Formed Members, Roof & Wall Panels.	

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Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

TOTAL 20	Create -	Evaluate 5	Analyse 5	Apply 5	Understand 5	Remember -	Knowledge Level MSE
20	4	4	4	4	4	-	ISE
60	10	10	20	10	10	1	ESE





					stoped roof buildings.	stope	
		f given	Sloped and flat roof buildings: drawing plans, Elevations and Cross Sections of given	buildings: drawing plans,	d and hat roof	Solore	
		st truss	ventilators, fixed ventilators, coupled roof, collar roofs. King Post truss, Queen Post truss	tilators, coupled roof, collar	lators, fixed ven	venti	
		swing	Panelled door, panelled and glassed door, glassed windows, paneled windows,	led and glassed door, glas	lled door, pane	Panel	
(06)	CO4		in.	Doors, Windows, Ventilators And Roofs:	s, Windows, Ve		Unit 6
			orner.	half brick walls in thickness at the junction of a corner.	prick walls in thi	halft	
		two &	English bond and Flemish bond- odd and even courses for one, one-half, two and two &	mish bond- odd and even c	sh bond and Fle	Engli	
		narbles.	copper alloys, aluminum alloys etc., lead, zinc, tin etc., earth, rock, timber and marbles.	num alloys etc., lead, zinc, t	er alloys, alumin	coppe	
		ıst iron,	materials and component, Brick, stone, plaster, sand filling, concrete, glass, steel, cast iron,	ent, Brick, stone, plaster, sai	rials and compor	mater	
,		Building	Sign Conventions- Plumbing System, Electrification System, Furniture system, Bu	umbing System, Electrificat	Conventions- P	Sign	
(07)	C04			d Bonds:	Sign Conventions and Bonds:		Unit 5
		(Planning Byelaws and regulations as per SP-7.	ning Byelaws and	Planr	
		uilding	Wind Diagram, Orientation, Factors affecting and criteria under Indian condition. Building	itation, Factors affecting and	l Diagram, Orien	Winc	
(2.5)		iagram.	Site Selection criteria, Principles of Building planning. Significance Sun path diagram.	a, Principles of Building pl	Selection criteri	Site	
(07)	CO3			Planning of Buildings (Residential and Public):	ning of Building		Unit 4
				on requirement.	lighting and ventilation requirement.	lighti	
		ickness,	Open space requirements, built up area limitations, Height of Buildings - Wall thickness,	ents, built up area limitation	space requirem	Open	
		ildings,	Floor Space Index (FSI), Principles underlying building byelaws, classification of buildings,	SI),Principles underlying bui	Space Index (F	Floor	
,		FAR) -	Terminology, Objectives of building byelaws, Floor Area Ratio (FAR) -	ology, Objectives of buildi	Introduction, Termin	Intro	
(06)	.CO3			Building Planning By Laws and Regulation :	ding Planning B	-	Unit 3
			Technical terms, types, Design of stairs, Roofs and floor: types and their suitability.	s, Design of stairs, Roofs and	nical terms, type	-	
		, Stairs:	methods of construction. Lintel: Classification, Doors and Windows: Classification, Stairs:	ion. Lintel: Classification, D	ods of construct	meth	
		arches,	brick bonds English and Flemish. Arches: Technical terms in arches, types of arches,	and Flemish. Arches: Tecl	bonds English	brick	
		ypes of	Rubble, Coursed Rubble and Ashlar Masonry. Brickwork and Brick Bonds - Types of	bble and Ashlar Masonry. I	ble, Coursed Ru	Kubt	
	C02	Un-coursed	Foundations: Types and their suitability. Stone masonry – Random Rubble, Un-c	and their suitability. Stone	dations: Types	roun	
(07)	COI			ts and Design:	Building Components and Design:		Unit 2
				lintels, roots, steps and stairs, utility fixtures.	s, roots, steps ar	-	
,	CO2	vs, sills,	Foundations, plinth, walls and columns in superstructure, floors, doors and windows, sills,	walls and columns in superst	dations, plinth,	Foun	
(07)	COI			ts:	Building Components:		Unit 1
Hours	СО		itents	Course Contents			
			Demonstrate requirements and method of application of various building services.	ents and method of application	instrate requirem	Demo	C04
		ng Code.	Plan and design of buildings as well as its components as per SP-7 and National Building Code.	ldings as well as its compone	ınd design of bui	Plan a	CO3
ents.	compone	of those	Draw the different building components and demonstrate requirements and suitability of those components.	lding components and demor	the different bui	Draw	.CO2
			d their application.	Knowledge about various building components and their application.	ledge about vari	Know	COI
				Course Outcomes (CO): Students will be able to	mes (CO): Stud	e Outco	Cours
			cnowledge	Prerequisite: Basic Civil Engineering, Building material knowledge	Basic Civil Eng	quisite:	Prere
n	02 Hrs 30 Min		Duration of ESE				
		60	ESE		03	Total Credits	Total
		20	ISE		00 Hrs/week	als	Tutorials
		20	MSE		03 Hrs/week	es	Lectures
		cheme	Examination Scheme		eme	leaching Scheme	Teach
			CE3505 MDM: Building Planning and Drawing	CE3505 NDM: Buildin			3
			Illira Year (Sem - v) B. Iech. Civil Engineering	I mird Year (Sem - V) B			
			or anguicering, ivalian	Third Von Com Vi D			
			Government College of Engineering, Karad	Covernment College			



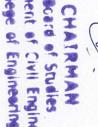


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	1		2			PO 9
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2	2	2	2		2	PSO

Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

TOTAL	Create	Evaluate	Analyse	Apply	Understand	Remember	Knowledge Level
20	5	-	-	5	5	5	MSE
20	5	-	-	5	5	5	ISE
60	20		1	15	15	10	ESE









CE3516: (Open Elective- 03) Environmental Impact Assessment Teaching Scheme CE3516: (Open Elective- 03) Environmental Impact Assessment				http://NPTEL.iitm.ac.in. T. V. Ramchandra, Environmental Management	ttp://NI	1. h
					linke	200
	Se	art-II,	ary, Pa		linistry ub-sect	
	2	nment	Enviro	j, R. R. Everitt, R. A. Carpenter, and S. L. Tu, in Asia, vol. 1. Asian Development Bank, 1997.	s. Loha	
Teaching Scheme CE3516: (Open Elective-03) Environmental Impact Assessment Lectures Charse Colorse Colo	SS	ntal Assessment	onmer	itoring and Supervision: Update.	ourceb	
Third Year (Sem – V) B. Tech. Civil Engineering, Karaid CE3516: (Open Elective–03) Environmental Impact Assessment e CE3516: (Open Elective–03) Environmental Impact Assessment Examination Scheme Page P				Environmental Buff	ence Bo	Refer
		Manage	992.	able Development. New York: Environment and Natural Resources Group, UNDP, 19	ustaina	8
Third Year (Sem – V) B. Tech. Civil Engineering. Karad CE3516: (Open Elective-0.3) Environmental Impact Assessment CO Hrs/week Co H	3	Janaga	Inits)	Nations Development Programme (UNDP). Handbook and Guidelines for Environment	Inited N	
Third Year (Sem – V) B. Tech. Civil Engineering. Karad CE3516: (Open Elective-0.3) Environmental Impact Assessment MSE CE3516: (Open Elective-0.3) Environmental Impact Assessment Impact Assessment MSE CE3516: (Open Elective-0.3) Environmental Impact Assessment Impact Assessment ElA, Impact Prediction, valuation and Mitigation, Impact on Decisions, Cost Benefit Analysis of ElA of construction Projects. Noironmental Auditing: Audit Methodology, Life Cycle Assessment (LCA) – Purpose, volution and Stages. Environment EMS Standards: IS14000, Benefits of Implementing O 14001.				for Environmental Impact A	300ks	1 ext
College of Engineering, Karad m – V) B. Tech. Civil Engineering e-03) Environmental Impact Assessment Examination Scheme MSE 20 ISE MSE 20 ESE 02 Hrs And tool M tool M tool M tool Environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India. Environmental concerns in India. Introduction, Purpose, Evolution, Forecasting Indige. Introduction, Purpose, Evolution, Forecasting Indige. Preliminary Stages of EIA, Impact Prediction, preliminary Stages of EIA, Impact Prediction, podology, Life Cycle Assessment (LCA) – Purpose, act Statement (EIS), Requisites of good EIS. MS Standards: IS14000, Benefits of Implementing				O 14001.	ISC	
College of Engineering, Karad m – V) B. Tech. Civil Engineering e-03) Environmental Impact Assessment Examination Scheme MSE 20 ISE Duration of ESE 02 Hrs f EM and EIA M tool M tool Molon M tool ESE Coess for construction projects the environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India. I Policies and Programmes in India. I Policies and Programmes in India. I Introduction, Purpose, Evolution, Forecasting Impact Statement (EIS), Strategic Environmental ing. Preliminary Stages of EIA, Impact Prediction, procedure Preliminary Stages of EIA, Impact Prediction, of Decisions, Cost Benefit Analysis of EIA of Statement (EIS), Requisites of good EIS.		C04	nting	avironment Management System: EMS Standards: IS14000, Benefits of Implement		Unit
College of Engineering, Karad m – V) B. Tech. Civil Engineering e-03) Environmental Impact Assessment Examination Scheme MSE 20 ISE Duration of ESE 02 Hrs FEM and EIA M tool Duration projects the environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India. Environmental concerns in India. Introduction, Purpose, Evolution, Forecasting an Legislations, Constitution of India. Introduction, Purpose, Evolution, Forecasting Impact Statement (EIS), Strategic Environmental ing. Preliminary Stages of EIA, Impact Prediction, on Decisions, Cost Benefit Analysis of EIA of		C03	ose,	nvironmental Auditing: Audit Methodology, Life Cycle Assessment (LCA) – Purpolution and Stages. Environment Impact Statement (EIS), Requisites of good EIS.		Unit
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE Duration of ESE 02 Hrs occss for construction projects the environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India. Introduction, Purpose, Evolution, Forecasting Impact Statement (EIS), Strategic Environmental ing. Preliminary Stages of EIA, Impact Prediction, of Decisions, Cost Benefit Analysis of EIA of				onstruction Projects.		
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE Duration of ESE 02 Hrs ocess for construction projects th environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India. al Policies and Programmes in India. Introduction, Purpose, Evolution, Forecasting Impact Statement (EIS), Strategic Environmental ing.		COS	of of	nation and Mitigation, Impact on Decisions,		
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE Duration of ESE 02 Hrs FEM and EIA M tool Cess for construction projects th environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India. al Policies and Programmes in India, Environmental an Legislations, Constitution of India. Introduction, Purpose, Evolution, Forecasting Impact Statement (EIS), Strategic Environmental			•	Documentation and Processes: Preliminary		Unit
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE 20 ESE Duration of ESE 02 Hrs of EM and EIA M tool M tool M tool M tenvironmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India. Introduction, Purpose, Evolution, Forecasting Introduction, Purpose, Evolution, Forecasting		CO3	ental	Strategic Er	env	
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE 20 ESE Duration of ESE 02 Hrs M tool M tool Duration of ESE M tool Cess for construction projects th environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India. al Policies and Programmes in India, Environmental an Legislations, Constitution of India.		CO2,	sting	Evolution,		Unit.
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE 20 ESE 60 Duration of ESE 02 Hrs ocess for construction projects th environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India.		CO2,	emai	ws and Legislations, Evolution of Indian Legislations, Constitution of India.		
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE Duration of ESE 60 M tool M tool Duration projects th environmental clearance procedure urse Contents gement, Definition, Scope, Goals and need. Environmental concerns in India Environmental concerns in India		3	antol	olicies & Programmes: Environmental Policies and Programmes in India Environmental		Unit
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE ESE 60 Duration of ESE 02 Hrs M tool M tool cess for construction projects th environmental clearance procedure urse Contents	Contract of	C01	need.	Environmental Management, Definition, Scope, Goals and nvironmental Movement, Environmental concerns in India.		Unit
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE ESE 60 Duration of ESE 02 Hrs ocess for construction projects th environmental clearance procedure		СО		Course Con	-	
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE ESE 60 Duration of ESE 02 Hrs ocess for construction projects				pare project report which is comply with environmental clearance procedure	Prepa	C04
College of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 1SE 20 ESE 60 Duration of ESE 02 Hrs f EM and EIA				bly environment impact assessment process for construction projects	Appl	C03
college of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Schell MSE ISE ESE Duration of ESE f EM and EIA				ce the evolution of EIA and use it as EM tool	Trace	C02
college of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE ISE ESE Duration of ESE 02 Hrs				wledge of the fundamental concepts of EM and EIA	Knov	C01
college of Engineering, Karad m – V) B. Tech. Civil Engineering e- 03) Environmental Impact Assessment Examination Scheme MSE 20 ISE ESE 60 Duration of ESE 02 Hrs				fcomes (CO): Students will be able to	se Outo	Cour
Third Year (Sem – V) B. Tech. Civil Engineering CE3516: (Open Elective- 03) Environmental Impact Assessment heme 02 Hrs/week 00 Hrs/week Duration of ESE 02 Hrs					quisite	Prere
Third Year (Sem – V) B. Tech. Civil Engineering CE3516: (Open Elective- 03) Environmental Impact Assessment beine		rs 30 Mi	02 H			0
Third Year (Sem – V) B. Tech. Civil Engineering CE3516: (Open Elective- 03) Environmental Impact Assessment Scheme O2 Hrs/week O3 Hrs/week O4 Hrs/week ISE			60	02 ESE	Credits	Total
Third Year (Sem – V) B. Tech. Civil Engineering CE3516: (Open Elective- 03) Environmental Impact Assessment g Scheme 02 Hrs/week MSE			20	ISE	ials	Tutor
CE3516: (Open Elective-03) Environmental Im			20	MSE	res	Lectu
Covernment College of Engineering, Karad Third Year (Sem – V) B. Tech. Civil Engineering CE3516: (Open Elective- 03) Environmental Impact Assessment			me		ning Sc	Teacl
Third Year (Sem - V) B. Tech. Civil Engineering				CE3516: (Open Elective-03) Environmental Impact Assessment		
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1			1			PO 8
2		1	-			PO 6 PO 7 PO 8 PO 9
	1	1	-		10	РО
1	1	1			_	PO
2	2	2	2			PSO
2	ယ	ယ	2		2	PSO

Guideline for Assessment Pattern(with revised Bloom's Taxonomy)

TOTAL	Create	Evaluate	Analyse	Apply	Understand	Remember	Knowledge Level 1
20		2	S	5	5	5	MSE
20		4	4	4	4	4	ISE
60		9	9	12	15	15	ESE



		Government College of Engineering, Karad	Karad	
	T	Third Year (Sem - V) B. Tech. Civil Engineering	igineering	
	CE3526:	CE3526: OE- 03 - (MOOC) Environmental Impact Assessment	inact Assessmen	
Teaching Scheme			Examination Scheme	eme
Lectures	r		MSF	-
Tutorials	1		ISE	
Total Credits 02	02		ECE	100
				100
10000	Common O. 1			

CO4 CO₃ CO2 COI Prepare project report which is comply with environmental clearance procedure

Course Contents Outcomes (CO):Students will be able to

Knowledge of the fundamental concepts of EM and EIA Apply environment impact assessment process for construction projects Trace the evolution of EIA and use it as EM tool

submit a copy of the certificate to Head of Department prior to ESE. Students should complete the MOOC course certification in the domain of Environmental Impact Assessment and

Guidelines:

- Selection of the MOOC course should be with the prior permission of Head of Department
- Duration for completion of MOOC course certification is minimum 8Weeks
- Platform: NPTEL or SWYAM only
- student in NPTEL or SWAYAM course certification and it will be converted to ESE score Assessment Guideline:- The evaluation of the MOOC Course will be based on at actual score secured by the
- If the student unable to submit the NPTEL or SWAYAM completion Certificate, in such cases evaluation (40 % weightage). will be based on assignment score (60% weightage) of registered NPTEL/SWAYAM and internal evaluation
- The rubrics for internal evaluation are given below.

Government College of Engineering, Karad Department of Civil Engineering

A. Y. 2025-26

Course Title :-

Course Code

Assessment Sheet

Class:

Reg. of Of Title Course Of Course Skill (08 Marks) No Student Course Of Cou	Name Course of Course Student Title (08 Marks)	No.	-)
Course of Course of Course (08 Marks)	Course of Course Of Course Skill (08 Marks) Knowledge Communication Skill (08 Marks)	Reg.		
Knowledge of Course (08 Marks)	Knowledge Communication of Course (08 Marks) Marks)	Name of Student		Manual Manager
	Communication Skill (08 Marks)	Course Title		
Communication Skill (08 Marks)	n	Knowledge of Course (08 Marks)		
	Presentation Skill (08 Marks)	Communication Skill (08 Marks)		
Content (08 Marks)		Q & A (08 Marks)		
	Q & A (08 Marks)	Total Marks (out of 40)		

Faculty Name and Sign.

Head of the Department





			Minimum number of Expaniment . 12		
00.					List of Submission:
CO1			to Revit	Introduction to Revit	Experiment 14
C02			n plan	Electrification plan	Experiment 13
C02			out plan.	Furniture layout plan.	Experiment 12
C02			Foundation / Centre Line Drawing.	Foundation /	Experiment 11
C03,C04				-	
CO2.			Working drawings by CAD	Working drav	Experiment 10
CO2,		g CAD.	Municipal Submission drawing by using CAD.	Municipal Su	Experiment 9
	ling by using CAD	anned in residential buil-	Full set of drawings for the building planned in residential building by using CAD	Full set of dra	
C02			Vertical and horizontal ventilation	Vertical and	Experiment 8
C02			Water supply and drainage plan.	Water supply	Experiment 7
CO2,			n plan	Electrification plan	Experiment 6
C02			out plan.	Furniture layout plan.	Experiment 5
CO2			Foundation / Centre Line Drawing.	Foundation /	Experiment 4
CO2, CO3,CO4			Wings	working drawings	Experiment 5
C03,C04					
C02.			Municipal Submission drawing.	Municipal Su	Experiment 2
	ding on drawing	anned in residential buil	Full set of drawings for the building planned in residential building on drawing sheet	Full set of dr sheet	
COI			Staircase design and Drawing.	Staircase des	Experiment I
CO		IS	Course Contents		
ble building	using AutoCAD. uidelines and applical	s and working drawings compliance with SP-7 g	Interpret and analyze municipal submission drawings and working drawings using AutoCAD. Plan and layout various types of public buildings in compliance with SP-7 guidelines and applicable building byelaws.	nd analyze mun ayout various ty	CO3 Interpret au CO4 Plan and la byelaws.
	0	,		Design (CAD) software.	-
puter-Aideo	digitally using Com	(on drawing sheets) and	Plan and design residential buildings both manually (on drawing sheets) and digitally using Computer-Aided	esign residentia	CO2 Plan and d
and design	ctional requirements	in accordance with fur	Design and prepare detailed drawings of staircases in accordance with functional requirements and design standards.	d prepare detail	CO1 Design and standards.
			ts will be able to	s (CO): Student	Course Outcomes (CO): Students will be able to
		and components.	are skill.	Auto CAD software skill.	
			Basic knowledge of different building units and components	sic knowledge	Prerequisite: Ba
	25	ESE		1	Total Credits
	25	ISE	week	2 Hrs/week	Practical
	Examination Scheme:	Exami			Laboratory Scheme:
		ning and Design Lab	CE3507: Building Planning and Design Lab		
	ng	Tech. Civil Engineeri	Third Year (Sem - V) B. Tech. Civil Engineering		
		Core numeric Conege of Engineering, Marau	COTOR STREET, CONTACT OF A		





-	CO4	003	COZ	001	Ç0 J	1	РО
1: Slight(Low	2	-		2	,		PO I
Low)	1		· ·				PO2
2	2	· ·	3	w			PO 3
: Moder	S	2	2	-			PO 4
2: Moderate(Medium	2	w	ن	1			PO 5
ium)	2	2	2	-			PO 6
3: Substantial(High)	2	3	w	1			PO 7
	1	1	1	1			PO 7 PO 8
	1	2	2	1			PO 9
	2	2	2	-			PO 10
		1	1	-	* 3		PO 11
	2	2	2.	2			PSO I
	2	2	2	2			PSO 2

Guideline for Assessment Pattern:

ISE	l ask III	T ask II	Task I	Skill Level (as per CAS Sheet)
25	05	05	15	AS Exp
		-	-	
25	05	0.5	15	Exp 2
25	05	05	15	Exp 3
25	05	05	15	Exp 4
25	05	05	15	Exp 5
25	05	05	15	Exp 6
25	05	05	15	Exp 7
25	05	05	15	Exp 8
25		05	15	Exp 9
25	05	05	15	Exp 10
25	05	05	15	Exp 11
25	05	05	15	Exp 12
25	05	05	15	Exp 13
25	05	05	15	Avg

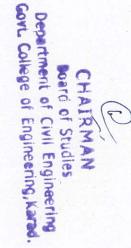


				AUROS OR ORDERESSIONS.
				liet of Cubmission.
CO4	978 method	Determination of viscosity value of tar by IS: 1206 – 1978 method	termination of viscosity v	Experiment 12 De
C04	3 – 1978 method	Determination of ductility value of bitumen by IS: 1203 – 1978 method	termination of ductility va	
C04	y IS: 1209 – 1978 method	Determination of flash & fire point value of bitumen by IS: 1209 – 1978 method	termination of flash & fir	
CO3	IS: 1205 – 1978 method	Determination of softening point value of bitumen by IS: 1205 – 1978 method	termination of softening p	Experiment 9 De
CO3	1203 – 1978 method	Determination of penetration value of bitumen by IS: 1203 – 1978 method	termination of penetration	
Maya			Method by IS:17127:2019	
	Determination of Stability, Flow and Bulk Density of Bituminous Mixes by Marshall	Flow and Bulk Density of	termination of Stability,	Experiment 7 De
by CO3,	material of pavement	Value of subgrade	Determination of CBR IS: 2720 Part 16 1987 method	Experiment 6 IS
by CO3	of coarse aggregates	egate Crushing Value	Determination of Aggregate IS: 2386 (Part IV) – 1963	Experiment 5 IS
ue CO 2,	Determination of Abrasion Value of coarse aggregates by Los Angeles abrasion value test by IS: 2386 (Part IV) 1963 method	Value of coarse aggregates 063 method	Determination of Abrasion Value of cotest by IS: 2386 (Part IV) 1963 method	
by CO2	of coarse aggregate	regate Impact Value	Determination of Aggregate IS: 2386 (Part IV) – 1963	
by CO 1	value of aggregate	gravity and water absorption hod	Determination of specific gravity IS: 2386 (Part III) 1963 method	
by CO 1	of coarse aggregate	s Index and Elongation Index od	Determination of Flakiness IS: 2386 (Part I) 1963 method	Experiment 1 Do
CO		se Content	Con	
on based o	Implement quality control measures and recommend improvements in pavement material selection based on test outcomes.	recommend improvement	lity control measures and	test outcomes.
	rable roads.	Analyse test results and choose the best materials for strong and durable roads	ults and choose the best n	
	Perform standard laboratory tests to assess the suitability of materials for pavement construction.	ss the suitability of material	rd laboratory tests to asses	CO2 Perform standa
	using standard methods.	Understand and test the basic properties of aggregates and bitumen using standard methods	test the basic properties of	CO1 Understand and
		.0	Course Outcomes (CO): Students will be able to	Course Outcomes (Co
		truction materials.	Prerequisite: Basic knowledge of building construction materials.	Prerequisite: Basic kr
			1	Total Credits
	ISE 25		2 Hrs/week	Practical
	Examination Scheme:			Laboratory Scheme:
	A C.	CE3508: Transportation Engineering Lab	CE3508: Tr	
	Ingineering	Third Year (Sem - V) B. Tech. Civil Engineering	Third Year (Se	
	g, Karad	Government College of Engineering, Karad	Government	

Minimum number of Experiments: 10

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-	004	203	202	3 2	CO Į	1	PO
1: Slight (Low)	-	-		ن د			PO I
Low)		u.	2	2			PO 2
2	Ç.	ı u	-				
: Moder	1	2	2	2			PO 4
2: Moderate (Medium)	1	-	1				PO3 PO4 PO5 PO6 PO7 PO8
dium)	2	2					PO 6
w	1	1	1	1			PO 7
: Substa	1	1	1	1			PO 8
antial (High	1	-					PO 9
th)		1	1	•			PO 10
	2	1	1	1			PO 11
	2	3	2	2			PSO 1
	ယ	2	2	2			PSO 2





Guideline for Assessment Pattern:

ISE	Task III	Task II	Task I	Skill Level (as per CAS Sheet)
25	05	05	15	Exp 1
25	05	05	15	Exp 2
25	05	05	15	Exp 3
25	05	05	15	Exp 4
25	05	05	15	Exp 5
25	05	05	15	Exp 6
25	05	05	15	Exp 7
25	05	05	15	Exp 8
25	05	05	15	Exp 9
25	05	05	15	Exp 10
25	05	05	15	Exp 11
25	05	05	15	Exp 12
25	05	05	15	Avg





	Minimum number of Experiments : 06	List of Submission: 1. Minimum numb
actors.	Construct a model that explains the Influence Line Diagram for at least two factors. Verify results by using Muller Breslaus principle.	
ord	Move a load across the statically determinate beams or truss structure and record reactions at different load positions. Compare results with computed values.	
	Verify results from theoretical predictions.	
	Load column models of different lengths and cross sections record its failure pattern. OR Record critical buckling modes for various boundary conditions.	7& 8 Pattern. Record critical
	different points with dial gauges. Compare experimental values with analytical methods.	
	Compare experimental values with analytical methods.	
93	Verify results using different analytical methods. Apply load to column model and measure resulting deflections and stresses using dial causes strain gauges.	Experiment Apply load to c
	Analyse given structures and classify them as determinate or indeterminate. Compute degrees of freedom and redundancy.	Experiment Analyse given 1 & Compute degre
	nce Line Diagrams (ILDs) Course Contents	CO4 Construct and Validate Influence Line Diagrams (ILDs)
rial, st	Analyse, determine, and apply the appropriate loading mechanism based on the type of material, structural element.	
	eoretical Results	-
		CO1 Analyse Structural Stability
	vill be able to	Course Outcomes (CO): Students will be able to
	s, Mechanics of Material	Prerequisite: Engineering Mechanics, Mechanics of Material
	ESE 25	Total Credits 1
		Practical 2 Hrs/week
"	Examination Scheme:	Laboratory Scheme:
	CE3509: Structural Mechanics Lab	
	Third Year (Sem - V) B. Tech. Information Technology	Third Y
		60





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_	CO4	03	02	COL	CO↓	1	PO	
1: Slight(Low)	2	2	2	2			POI	
Low)		-	2	2			PO 2	
2	2	2	2	2			PO3	
2: Moderate(Medium)	2	2	2	2				
ate(Med	2	2	2	2			PO 4 PO 5	
lium)	1	1	1	1			DESTRUCTION OF	
w	1 1		1	-			PO 6 PO 7 PO 8	
: Substa	2	2	2	2			PO 8	
ntial(High	- 1		1	1			PO 9	
h)	_			1			PO 10	
	2	2	2	2			PO 1.1	
	1	1	1	1			PSO I	
	-	1	-	-			PSO 2	

Guideline for Assessment Pattern:

ISE	I ask III	T ask II	Task I	Skill Level (as per CAS Sheet)
25	05	05	15	Exp 1
25	05	05	15	Exp
25	05	05	15	Exp 3
25	05	05	15	Exp 4
25	05	05	15	Exp 5
25	05	05	15	Exp 6
25	05	05	15	Exp 7
25	05	05	15	Exp 8
25	05		15	Exp 9
25	05		15	Exp 10
25	05		15	Exp 11
25	05	05	15	Exp 12
25	05	05	15	Avg



	Governi	Government College of Engineering, Karad	ng, Karad		
	Third Year	Third Year (Sem - V) B. Tech. Civil Engineering	Engineering		
	CE3510 MD	CE3510 MDM: Building Planning and Drawing Lah	Dawing a		
Laboratory Scheme:			Examination Scheme:	Schome.	
Practical	2 Hrs/week		ISE	50	
Total Credits			ESE	•	
Prerequisite: Ba	sic Civil Engineering, Bu	Prerequisite: Basic Civil Engineering, Building material knowledge			
Course Outcome	Course Outcomes (CO): Students will be able to	able to			
CO1 Draw vario	ous buildings as per the b	Draw various buildings as per the building by-laws and regulation	n.		
CO2 Skills of dr	rawing building elements	Skills of drawing building elements and plan the buildings as per requirements	requirements		
CO3 Apply the	knowledge of buildings p	Apply the knowledge of buildings planning in different building units.	units.		
CO4 Apply the	building bye laws and pri	Apply the building bye laws and principles of planning for residential and public buildings	ntial and public b	ouildings	
	0	Course Contents			CO
Experiment 1	Draw component parts	Draw component parts of a single storied residential building with suitable	building with su	itable	COI,
	symbols and scales.				CO2, CO4
Experiment 2	Draw different types o	Draw different types of stone and brick masonry.			CO1, CO2
Experiment 3	Draw different types of shallow foundation	f shallow foundation.			CO1, CO2
Experiment 4	Draw different types of deep foundation.	f deep foundation.			CO1, CO2
Experiment 5	Draw different types of doors and windows	f doors and windows.			CO1, CO2
Experiment 6	Draw different types Staircase	taircase.			CO1, CO2
Experiment 7	Draw a line plan of residential building	idential building.			COI,
Experiment 8	Prepare the Drawing o	Prepare the Drawing of Sign Conventions/Symbol for electrical wiring system	or electrical wirin	g system	C02,C03,C04
Experiment 9	Prepare the Drawing o	Prepare the Drawing of Sign Conventions/Symbol for Plumbing system.	or Plumbing syste	m.	C03
Experiment 10	Drawing line plans of	Drawing line plans of public buildings (select one building from of the	ilding from of th	ie	COI,
	3. Buildings for	3. Buildings for transportation 4. Assembly buildings	Buildings uildings		C02,C03,C04
List of Submission:					
1.	Minimum number of Experiments: 08	xperiments: 08			
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Guideline for Assessment Pattern:

ISE	Task III	Task II	Task I	Skill Level (as per CAS Sheet)
25	05	05	15	Exp 1
25	05	05	15	Exp 2
25	05	05	15	Exp 3
25	05	05	15	Exp 4
25	05	05	15	Exp 5
25	05	05	15	Exp 6
25	05 -	05	15	Exp 7
25	05	05	15	Exp 8
25	05	05	15	Exp 9
25	05	05	15	Exp 10
25	05	05	15	Avg





		Government College of Engineering, Karad	, Karad		
	T	Third Year (Semester - V) B. Tech. Civil Engineering	Engineering		
		CE3511: Industrial Training	J4		
Teaching Scheme	me		Examination Scheme	heme	
			ISE	25	
Tutorials	01 Hrs/week			1	
Total Credits 01	01				
Prerequisite: Si	urveving, Buildi	Prerequisite: Surveying, Building Constructions and Drawing. Structural Analysis	nalveie		

Course Outcomes (CO): Students will be able to

COI	CO1 Apply theoretical knowledge to practical civil engineering tasks in an industrial setting.
.CO2	CO2 Describe use of advanced tools and techniques encountered during industrial training and visit.
CO3	Collaborate effectively within multidisciplinary teams to achieve project goals.
CO4 F	Prepare professional work reports and presentation

Course Contents

Students need to choose the right area of Civil Engineering out of following discipline,

- l. Construction work.
- II. Planning and design.
- III. Quantity Estimation.
- IV. Survey
- V. Investigations.
- Management.

from the authority/company and undergo field training to achieve course learning outcomes. They must approach the respective authority/company through proper communication channel to obtain the permission

Period of Industrial Training

The period of Industrial Training must be after fourth semester and in summer vacations. The student has to devote 90 -Civil Engineering Program. 100 man - hours (@ 20 days - 5 hour/day) distributed over the vacations since completion of Second Year B. Tech,

Reporting and Submission requirements

photographs, videos and day wise field notes. The field notes may consist of: At the start of fifth semester, the student must submit a report to mentor; based on the area they have completed for the fulfillment. The report must be attached with certificate from appropriate authority/company, actual

- 1. Communication records.
- 2. Log of activities.
- Work specifications.
- Analysis of material.
- Laboratories and cost requirements.
- 6. Details of billing system.
- 7. Regular reporting to Mentor.
- Certificate from Company/Organization/Firm stating attendance, satisfactory completion of work assigned.
- 9. Feedback by employer.
- 10. Report consisting of introduction.
- Study/Work carried out.
- 12. Observations and outcomes

Guideline for Assessment Pattern





Student must submit finalized report at the end of the semester. Student has to present his/her work to examiner for evaluation.

Mapping of COs and POs

CO 4	COS	CO 2	201	¢	3	1	РО
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Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

TOTAL	Create	Evaluate	Analyse	Apply	Understand	Remember	VIIOMIEGE PEAGI
50	10	10	10	10	10	1	LOE





		Government College of Engineering, Karad		
		Third Year (Sem - VI) B. Tech. Civil Engineering		
Teaching	o Scheme	CESOVI: Foundation Engineering		
Lectures	10	MSE 20		
Tutorials				
Total Credits	edits 03			
3		Duration of ESE	02 Hrs 30 Min	n
Frerequ	Prerequisite: Geotechnical Engineering	ngineering		
Course	Course Outcomes (CO): Students will be able to	ents will be able to		
-	Understand the import	Understand the importance of site exploration and investigation methods for civil engineering projects.	projects.	
-	Describe the concept of	Describe the concept of slope stability and provide an overview of rock fill structures.		
-	Evaluate the bearing c	Evaluate the bearing capacity, analyse and design shallow and deep foundations		
CO4	Familiarize with the m	Familiarize with the modern substratum techniques.		
		Course Contents	СО	Hours
Unit 1	Soil exploration and	Soil exploration and geotechnical investigation:	CO1	(06)
	Significance of site	Significance of site exploration, site reconnaissance, site exploration, methods of site		
	exploration, soil sar	exploration, soil sampling and samplers, types of soil sample: disturbed & undisturbed		
	samples, in – situ te Cone Penetration Te	samples, in – situ tests (Standard Penetration Test, Dynamic Cone Penetration Test, Static Cone Penetration Test, Test using pressure meter, field vane shear test) preparation of soil		
	investigation report.	7) F. T		
Unit 2	Stability of slopes:		CO2	(06)
	Slope failure basis of	Slope failure basis of analysis, types of slope failure, stability of an infinite slope of		3
	number, Bishop's n	number, Bishop's method, Swedish circle method, concept of friction circle method.		
	improving stability of slopes.	slopes.		
Unit 3	Bearing capacity of	Bearing capacity of shallow foundations:	CO3	(08)
	bearing capacity fail	bearing capacity failures, I.S. code method (IS 6403: 2002), effect of various factors on		
	bearing capacity (s	(size & shape, depth, water table, eccentricity), bearing capacity		
	settlements, methods	settlements, methods of computing settlements, numerical on calculation of ultimate and		
	net bearing capacity.	The state of the s		
Unit 4	Design of shallow foundations:	undations:	CO3	(08)
	Types and their selection of design of footing	Types and their selection, Rankine's analysis for minimum depth of foundation, principle of design of footings, assumptions & limitations of field design of footings.	((00)
	design (numerical) c	design (numerical) of isolated, combined, strap footing (rigid analysis), raft foundation		
	(elastic analysis), floa	(elastic analysis), floating foundations – concept.		
Unit 5	Pile foundations:		CO3	(07)
	Types and their Nec	Types and their Necessity, classification, construction methods of concrete bored piles,		
	driven cast in-situ pi	driven cast in-situ piles, load carrying capacity based on static analysis for cohesive and		
	cohesion less soils, p	cohesion less soils, pile capacity using in- situ penetration tests and pile load test as per (IS		
	ultimate capacity, set	ultimate capacity, settlement of nile groups in sand and also (18 2011, 2010)	,	
	depth method, tension piles.	depth method, tension piles.		





Unit 6 Foundations in difficult subsoil: General considerations, foundations in expansional reinforcement, techniques of ground impressions present on each unit Text Books 1. Arora K. R., "Soil Mechanics and Foundation Enginerate B. C., "Soil Mechanics and Foundation Enginection of the control of t	General considerations, foundations in expansive soil and collapsible soil, significance of soil reinforcement, techniques of ground improvement – stone columns, vibro-flotation, preloading technique, sand drains, prefabricated vertical drains. Ignment on each unit Flooks Punnia B. C., "Soil Mechanics and Foundation Engineering", Standard Publishers (7th Edition). 2019. (All units) Punnia B. C., "Soil Mechanics and Foundation Engineering", CBS Publishers & Distributors (1st Edition). 2018. (Unit 1,4) Punnia G. & Rao A. S., "Basic and Applied Soil Mechanics", New Age International Publishers (3th Edition). (Unit 1,2) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia G. & Rao A. S., "Basic and Applied Soil Mechanics", New Age International Publishers (3th Edition). (Unit 1,2) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) Punnia B. M., "Foundation Engineering", Cengage Learning (7th Edition). 2013. (All Units) P	4. Ranjan G. & Rao (Unit 1,2)	3. Nayak N. V., "Fou	4. Terzaghi K. & Pec 1996. (All Units)		-	e -	Useful Links I. https://nptel.ac.in Engineering – M	efu .	efu .
	ive soil and collapsible soil, significance of rovement – stone columns, vibro-flotation, 1 vertical drains. leering", Standard Publishers (7th Edition). 201 incering", Laxmi Publications (17th Edition). 201 ingineering", CBS Publishers & Distributors (Mechanics", New Age International Publish Mechanics", New Age International Publish arning (7th Edition). 2013. (All Units)	A. S., "Basic and Applied Soil	ındation Design Manual", Dhanpa	k Wiley R., "Soil Mechanics in Er	andard Specifications and Codes			/courses/105/107/105107120/ _Nahendra Singh, Priti Maheswari	/courses/105/107/105107120/N lahendra Singh, Priti Maheswari /courses/105/105/105105176/ — Fo	/courses/105/107/105107120/ _Nahendra Singh, Priti Maheswari /courses/105/105/105/105105176/ — Fo
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Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

TOTAL	Create	Evaluate	Analyse	Apply	Understand	Remember	Knowledge Level
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	S. Chand Publication	tice for Plain and Reinforced Congreta Deve	,4,5,6) 00: Code of prac	IS 456 - 20	
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CO3 CO3, CO1 CO2, CO3	tion to eccentric footi	and moment, design of combined rectangular footing, introduction to eccentric footing	noment, design	and r	
CO3 CO3, CO1 CO3	h subjected to axial lo	Design of isolated rectangular column footing with constant depth subjected to axial load	n of isolated rec		Unit 6
CO2, CO3, CO3, CO3, CO3, CO3, CO3, CO3, CO3	and rectangular colum	interaction diagrams, circular column with helical reinforcement	ction diagrams,		
CO2, CO3, CO3	(se.	and dog legged staircase.		Unit 5
CO2, CO2, CO3, CO3,	slab, two way slabs w	a) Design of slabs: Cantilever slabs, simply supported one way slab, two way slabs with different support conditions. b) Design of staircase: simply supported single flight staircase	ent support cond		1
CO2, CO3, CO3, CO3, CO3, CO3, CO3, CO3, CO3		commendations.	minorit, and 15 16	-	T _n :
CO2, CO2, CO2, CO2, CO3	nent length. b) Limit st types of cracks, caus	of serviceability: deflection criteria, cracking - classification and types of cracks, causes, mechanism, and IS recommendations	of serviceability: deflection criteria, mechanism, and IS recommendations	of se	
CO2, CO3	n of shear reinforceme	a) Littli state of collapse (shear and bond): Shear failure, design of shear reinforcement,	mit state of coll		o mir
CO CO	, manage sommon	rectangular sections, singly reinforced T and L beams.	ngular sections, s		11.
COI CO	v and doubly reinfor	Limit state of collapse (flexure): Analysis and design of singly and doubly reinforced	t state of collap	_	Unit 2
COI	or, partial safety fact	stress block parameters.	stress block parameters.	stres	
CO	ilosophies, various li	strenoth and characteristic load load 6	states, characteristic	state	
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		1	duction: Ct-non		Ilmir 1
		Design and Analyse Columns and Footings	and Analyse Co	-	CO4
		Apply Serviceability Criteria and Design Structural Elements.	Serviceability C		CO3
		Analyse and Design Structural Members for Limit State of Collapse	se and Design St		C02
		Understand the Stress-Strain Behaviour and Design Philosophies	stand the Stress-S		COI
		Course Outcomes (CO): Students will be able to	mes (CO): Stud	urse Outco	Cor
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Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

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	10	20	10	1	20	ESE



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		rveying", (3 rd Revised Edition), 1987.		i.
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П	2019. (A	Rangwala S. C., "Elements of Estimating and Costing", Charotar Publishing House (41st Edition). 2019. (All Units)		-
			Text Books	Te
(08)	CO4	hold and lease hold property, depreciation, straight line method, balance declining method and sinking fund method, capitalized value and annualized value of an old building, different methods of valuation, preparation of valuation report.		
(06)	C04			
(06)	Cos		Item of Work, Material Quality, labo and plant usage, overheads and profit. Rate analysis of key construction it flooring, roofing, painting, etc.)	7
(07)	CO2,	buildings and other civil engineering works; C. C works including bar bending schedule,	Detailed Estimates: Methods for Detailed Estimates: Buildings, R. Determination of earthwork in road. Unit 4 Rate Analysis: Introduction, Purpose	
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n	UIIAI OC SJEJ 70	anon or pop	Prerequisite: Basic Civil Engineering, Building Planning and Design, AutoCAD.	7
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		MSE 20	Lectures 03 Hrs/week	
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 PWD hand book, red book and standard schedule of rates. (Unit 4) National Building Code of India – Guidelines for regulating the building construction activities. (Unit 6) https://www.youtube.com/watch?v=GGikveOcaJw&t=22s (Unit 1,2,4) https://www.youtube.com/watch?v=b3cG_gSO6gM (Unit 4,5,6) https://www.youtube.com/watch?v=ofkpm4lhJcg&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=7
5. National Building Code of India – Guidelines for regulating the building construction activities. (Unit 6) Useful Links 1. https://www.youtube.com/watch?v=GGikveOcaJw&t=22s (Unit 1,2,4) 2. https://www.youtube.com/watch?v=b3cG_gSO6gM (Unit 4,5,6) 3. https://www.youtube.com/watch?v=ofkpm4lhJcg&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=7 (Unit 1,2,4,5,6)
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 https://www.youtube.com/watch?v=GGikveOcaJw&t=22s (Unit 1,2,4) https://www.youtube.com/watch?v=b3cG_gSO6gM (Unit 4,5,6) https://www.youtube.com/watch?v=ofkpm4lhJcg&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=7 (Unit 1,2,4,5,6)

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Guideline for Assessment Pattern(with revised Bloom's Taxonomy)

TOTAL	Create	Evaluate	Analyse	Apply	Understand	Remember	Knowledge Level
20	1	5	1	5	5	5	MSE
20		4	4	4	4	4	ISE
60		10	20	10		20	ESE



		Unit 6		Unit 4		Unit 2	Unit 1	CO4 App	CO3 Und	2	Pre requis	I otal Credits	Tutorials	Lectures Scheme		
TBM, DBM, Geological inputs for DPR & Feasibility Reports, Design Philosophy for rock support.	faults in dam Foundation and its treatment, causative factors of dam disasters, Preliminary investigation and selection of a dam site Tunnel: Geological appraisal for tunnels, Selection of options for method of execution.	Engineering Geology considerations for:	Introduction, different stages of site investigation, aerial photography interpretation and satellite remote sensing, geophysical exploration, subsoil exploration and sampling of soils, methods of subsoil exploration, exploratory drilling in rocks. Engineering consideration of structural features	Rock Mass Classification Introduction, Engineering rock mass classification: Terzaghi's rock mass classification, Rock quality designation index (RQD), Rock Structure Rating (RSR) Geomechanics Classification: Bieniawski Rock Mass Rating (RMR) system, Geological Strength Index (GSI). Rock Tunnelling Quality Index (Q Index)	Application of Rock Mechanics in Engineering Introduction, relevance of rock mechanics in evaluating rock and rock mass properties, measurement of strength of intact rock, elastic properties of rocks, measurement of stress in underground rocks, estimation of rock mass properties- Porosity, Density, Hydraulic permeability and conductivity, Strength, Slaking and durability, Sonic Velocity as an index to degree of fissuring.	Groundwater in Relation to Engineering Works. Systematic groundwater investigation. Occurrence of groundwater in Deccan trap region. Water Pumping Tests: approach and utility, influence of subsurface water in engineering constructions, case study on groundwater problems and its solution	ollective trap regi Deccan 1	Apply various rock mass indices for evaluating rock suitability for civil engineering projects Course Contents	Acquire and apply knowledge of the preliminary geological investigations for civil engineering projects Understand various rock mass prosperities for geological investigation of civil engineering sites	COI Understand and apply the knowledge of tectonic and seismic activities in Deccan traps	Pre requisite: Geoscience	3	1	Scheme 3 Hrs/week	CE3014: (Frogram Elective 01) Advanced Engineering Geology	Government College of Engineering, Karad Third Year (Sem – VI) B. Tech. Civil Engineering
gn Philosophy for rock	lam, adverse effects of disasters, Preliminary method of execution -		aphy interpretation and n and sampling of soils, neering consideration of	nass classification, Rock (RSR) Geomechanics ological Strength Index	d rock mass properties, measurement of stress in ity, Density, Hydraulic c Velocity as an index	Deccan trap region.	explanation of seismic activity, on, Reservoir Induced Seismicity trap region. RIS and Reservoir y Borehole Geophysics Research	ngineering projects	s for civil engineering pro	Deccan traps.	E and HOLL OF EST	ESE OF ESE	ISE	Examination Scheme	neering Geology	Karad gineering
	CO4	C02,	C02, C04	C04	C03	C02	C01	CO	jects		02 HIS	60	20	30		
		(08)	(06)	(07)	(07)	(05)	(07)	Hours			UIM OC S					





2	2.	-	Useful Links	ò	4.	ب.	;		Refere	3.	2.		Text Books			
http://patologic/	http://nptel.ac.in/courses/105104152/Prof. Javed N. Malik IIT Kannur (All Hite)	http://nptel.ac.in/courses/105105106/Dr. DebasisRoy IIT Kharagour (All IInite)	Links	Bhawani Singh and R.K. Goel, 'Engineering Rock Mass Classification-Tunnelling, Foundations and Landslides'Butterworth-Heinemann Publishers, 2016 () Unit4	M.B.Billings, 'Structural Geology', Prentice Hall, INC, 1961 (Unit 1,4)	Krynine& Judd, 'Principles of Engineering Geology and Geotechnics', CBS Publishers and Distributors., 2003 (Unit 1,2,4,5)	A. C waltnam, 'Foundations of Engineering Geology', Blackie Academic & Professional, Chapman & Hall, First Edition, 1997. (All Units)	D.K. Todd, 'Groundwater Hydrology', John Wiley & Sons, 1993.(Unit 2)	Reference Books	N Chenna Kesavulu 'Textbook of Engineering Geology'. Laxmi Publications 2013 (All IInite)	S. Gangopadhyay 'Engineering Geology' Oxford University Press 2013 (Unit 1 2 4 5)	Parbin Singh, 'Engineering & General Geology' S.K. Kataria and Sons 1997 (All Units)	1	investigation of a bridge site, locating a bridge at different reaches of a river, bridge foundation in subsoil in relation to depth of scouring.	Bridge: Supports and foundations of bridges, different aspects of engineering geological	

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Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

TOTAL 20 20	Create	Evaluate 5 4	Analyse - 4	Apply 5 4	Understand 5 4	Remember 5 4	Knowledge Level MSE ISE
60	1	10	20	10	1	20	ESE



	-			
(07)	CO3	aulic,	machine-room-less	
3	C04	 s, alarm mechanisms. und fire hydrants: Design principles, components, water ventilation systems: Pressurization, compartmentalization. standards: NBC, NFPA, IS codes related to fire safety. 		=
(96)	COI	e detection and alarm systems: Smoke	Unit 4 Fire Protection an	
(06)	CO2 CO4		systems: Psychror Types of ductless s Energy c	
(07)	CO1 CO4	s of electrical wiring: Wiring systems, circuit tase systems: Load balancing, phase considerations. ns: Power demand estimation, distribution boards. rotection: Methods, importance in building safety. ystems: LED, CFL, smart lighting control systems. dards: Smart grids, sensors, IoT-based monitoring.	components, cable selection. Single-phase and three-phase Electrical load calculations: Earthing and lightning prot Energy-efficient lighting syst Automation and safety standa	
		Drainage design, sustainal		_
(07)	COI	pry Systems: Types of plumbing systems: One pipe advantages and applications. advantages and applications. Selection criteria, installation, and maintenance. d greywater reuse: Collection systems, treatment drainage systems: Pipe slopes, traps, vent pipes, Drainage design sustainable urban drainage systems.		
Hours	СО		Unit 1 Plumbing and W	_
		Acquire knowledge about automation and smart building technology.	CO4 Acquire knowledge	
	S.	Analyse energy-efficient and sustainable building services.	CO3 Analyse energy-effi	
		Understand the fundamental principles and design of building services. Learn about plumbing electrical HVAC fire of the fire	CO2 Learn about plumbin	
		dents will be able to	Course Outcomes (CO): Students will be able to	
		trification, fire services.	Prerequisite: Basic knowledg	jangana
	02 Hrs 30 Min	Duration of ESE		T
		ISE 20	Total Credits 03	ء اب
		MSE 20		
		Examination Scheme	Teaching Scheme	
		CE3624: (Program Elective 01) Building Services		
		Third Year (Sem - VI) B. Tech. Civil Engineering	Ł	
		Government College of Engineering, Karad		_





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https://archive.nptel.ac.in/courses/105/102/105102176/ "NPTEL: Air Conditioning and Refrigeration." NPTEL	https://youtu.be/0LNklcBhl Q?si=8DrnuDOLHaTxfOL3 "HVAC Rasics " You Tube (I In:t 2)	Useful Links	M. Kutz, "Handbook of Heating, Ventilation, and Air Conditioning," McGraw-Hill. (Unit 3)	John Bird, "Electrical and Electronic Principles and Technology," Elsevier. (Unit 2)	David V. Chadderton, "Building Services Engineering," Routledge. (Unit 1.2,4)	A.F.C. Sherratt, "Air Conditioning and Energy Conservation," The Architectural Press. (Unit 3)	Reference Books	R. G. Hopkinson & J. D. Kay, "The Lighting of Buildings," Faber & Faber. (Unit 2)	S. C. Rangwala, "Water Supply and Sanitary Engineering," Charotar Publishing House. (Unit 1)	Fred Hall & Roger Greeno, "Building Services Handbook," Routledge. (All Units)	William H. Severns & Julian R. Fellows, "Heating, Ventilating and Air Conditioning," John Wiley & Sons. (Unit 3)	Books	Sustainable and Smart Building Services:- Green buildings and rating systems: LEED, GRIHA certification process Smart building automation: IoT-based monitoring, sensor-controlled systems. Renewable energy integration: Solar PV, wind energy, geothermal systems. Case studies of sustainable buildings: Examples from India and global initiatives	
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NPTEL											ns. (Unit		(07)	

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Guideline for Assessment Pattern(with revised Bloom's Taxonomy)

TOTAL	Create	Evaluate	Analyse	Apply	Understand	Remember	Knowledge Level
20	1	5	-	5	5	5	MSE
20	1	4	4	4	4	4	ISE
60	1	10	20	10		20	ESE





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				Reference Books	Refer
			S. K. Hirde and M. Hedaoo, Theory of Structures. Pune, India: Techmax Publication.	S. K. I	3.
			Negi and R. S. Jangid, Structural Analysis. New Delhi, India: Tata McGraw Hill.	L. V. 7	+
			S. Keddy, Basic Structural Analysis, 3rd ed. New Delhi, India: Tata McGraw Hill, 2014.	2 0	-
			s	Text Books	Text
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		Cimia		1)	
		rtals,	Stiffness coefficients, development of stiffness matrix, analysis of beams and portals	S	
(0/)	04	Tals	Flexibility coefficients, development of flexibility matrix, analysis of beams and portals	'n	
	3		Matrix Method:	- 10-4	Unit 6
		WILD	different. flexural rigidity.	р	
(07)	C04	:	rouse memod: Clapeyeron's theorem of three moments in continuous beam sinking of support house it.		· OIIII S
			sway.		11
		hout	of continuous beams with and without settlements, Analysis of frames with and without	0	
(07)	CO2,	lysis	Introduction, Concept, Relationships between bending moment and deformations, Analysis	L	
(07)	CO3		Kani's Method:		Unit 4
	COS	allics		×	
(00)	CO2,	amac	ethod: application to beam, sinking	7	
90	3		Displacement Method:		Unit 3
	CO3	ıkıng	of supports, portal frames without sway, with sway.	0	
(07)	CO2,		Slope deflection method. Modified slope deflection equation application to Leave 1.		
			Displacement Method:		Unit 2
		two	hinged parabolic arch with supports at same level (Degree of \$1 < 2)	Ъ	
		thod.	Statically indeterminate hear truss (lock of fit and temperature in the state of th	× 1	
(06)	C01		Reffie's Law Maywell's reciprosol theorem Costicling.		. (
Hours	СО		Course Contents		Ilnit 1
		s.	Calculate the nodal displacements and member forces by using force and matrix methods.		
			Determine the effect of support settlements for indeterminate structures.	-	203
			force using slope deflection, moment distribution method and Kani's method.	-	2
nd shear	oment ar	ding m	Apply knowledge of mathematics and engineering in calculating slope, deflection, bending moment and shear		C02
			Analyse energy theorem for statically indeterminate beam, truss and parabolic arch.		COI
			Course Outcomes (CO): Students will be able to	rse Ou	Cour
			Prerequisite: Mechanics of Materials, Structural Analysis.	equisi	Prer
n	Hrs 00 Min	03 H	Duration of ESE		5
		60	O3 ESE	Total Credits	Tota
		20	00 Hrs/week ISE 20	rials	Tutorials
		20	MSE	ures	Lectures
		eme		0.0	Teac
		II'e	CE3634: (Program Elective 01) Analysis of Indeterminate Structure		
			Third Year (Semester - VI) B. Tech. Civil Engineering		





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http://www.nptelvideos.in/2012/11/structural-analysis-ii.html Prof. P. Bannerjee	http://www.nptelvideos.in/2012/11/advanced-structural-analysis.html Prof. Devdas Menon	Useful Links	ISBN: 8174092056. (Unit- 1,2,3)	V. N. Vazirani and M. M. Ratwani, Analysis of Structures: Vol. 1 & II. New Delhi, India: Khanna Publishers, 2002	(Unit-2,3)	S. B. Junnarkar and H. J. Shah, Mechanics of Structures (Vol-II), 24th ed. Anand. India: Charatar Publishers, 2015	1577661435. (Unit- 6)	J. M. Gere and W. Weaver, Matrix Analysis of Structures. Long Grove, IL, USA: Waveland Press, 1994, ISBN:	(Unit-5)	P. Pandit and S. P. Gupta, Structural Analysis - Matrix Approach, 2nd ed. New Delhi, India: McGraw Hill 2005	Publishing House Pvt. Ltd., 2011. (Unit-4)	K. U. Muthu, I. Azmi, and M. Janadharn, Basic Structural Analysis. New Delhi, India: I. K. International	(Unit-2)	D. Menon, Advanced Structural Analysis. New Delhi, India: Narosa Publishing House, 2009. ISBN: 1842654977	D. Menon, Structural Analysis. New Delhi, India: Narosa Publishing House, 2008, ISBN: 8173197504. (Unit- 4)	(Unit-2,3,5)	C. K. Wang, Indeterminate Structural Analysis. New Delhi, India: Tata McGraw Hill, 2014, ISBN: 007068135X.	Hill, 1948. (Unit -2,3)	C. H. Norris, J. B. Wilbur, and S. Utku, Elementary Structural Analysis, 1st ed. New Delhi. India: Tata McGraw	(Unit-1)

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Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

TOTAL	Create	Evaluate	Analyse	Apply	Understand	Remember	Knowledge Level
20		5	5	5	5	1	MSE
20	4	4	4	4	4	-	ISE
60	10	10	20	10	10	ı	ESE





		(Unit 1,2,3)	Papacostas, C.S., Fundamentals of Transportation System Analysis, PHI (Unit 1,2,3)	as, C.S., Fundamer	Papacos	4.
	t 4,6)	Prentice Hall, Inc. (Unit	Vukan R. Vuchic, Urban Public Transportation System & Technology, Prentice Hall, Inc. (Unit 4,6)	. Vuchic, Urban Pu	Vukan F	3.
	5,6)	Tata McGraw Hill Pub. Co. (Unit 3,4,5,6)	John W. Dickey, Metropolitan Transportation Planning, Tata McGraw H	Dickey, Metropolit	John W.	2.
-	Co. (All	g, McGraw Hill Book (Hutchison, B.G., Introduction to Transportation Engineering, & Planning, McGraw Hill Book Co. (All Units)	n, B.G., Introduction	Hutchis	
				oks	Reference Books	Refe
		i. (Unit 2,3,4)	g And Design. Dhanpat Rai Pub, New Delhi. (Unit 2,3,4)	S.C. Saxena Traffic Planning And Design.	S.C. Sax	3.
	all, NJ (ntroduction, Prentice-Ha	1,2,3,4)	isty, S.C. and Kent	1,2,3,4)	· i
	Units)	ishers, New Delhi (All	Traffic Engineering & Transport Planning, Khanna Publishers, New Delhi (All Units)	, L.R., Traffic Engi	Kadiyali, L.R.,	٠.
	-				Text Books	Tex
	٤	ram, Legislation and lav	enforcement.	enforcement.	enf	
24	C04	prevent accidents,	Traffic Safety: Road accidents, Types, Causes, effect, Measures to prevent accidents,	tfic Safety: Road ac		Unit 6
			trees, maintenance of trees- protection, care of road side trees.	s, maintenance of t		
24		g types of selection of	light sources, Arboriculture- Definition, objectives, factors affecting types of selection of	t sources, Arboricu	ligh	
23	CO3	nance factors, Types of	Definitions- Luminaire, foot candle, Lumen, utilization and maintenance factors, Types of	initions- Luminaire	De	
2	2	light distribution	Road Environment and Arboriculture: Street Lighting: Methods of light distribution	d Environment and	-	Unit 5
2	C04	Transport System for	traffic management.	traffic management.	trai	
10	COI	standards, Traffic	Regulatory Measures Connection and Living TSM) with IRC standards, Traffic	uletery Measures	-	OIII 4
C04	C			personnel.	-	
CO2	C	s of traffic control	Grade separation, Traffic signs and road markings, Significant roles of traffic control	de separation, Traf	Gra	
COI	CO	ection, Signal design,	Traffic Design and Visual aids:- Intersection Design-Rotary intersection, Signal design.	ffic Design and Vis		Unit 3
2	04	ACA: TEACT OT SETAICE-	nd significance.	Concept, applications and significance.	Со	
9		rveys, Vehicles Volum	Survey including non-motorized transports. Origin Destination Surveys, Vehicles Volume	vev including non-		- OIIII 2
			egration.	transport and modal integration.	+	
		approach- land use &	Concepts of passenger car units for mixed traffic flow, Sustainable approach- land use &	ncepts of passenger	Co	
(affic problems in India,	Objectives and scope of traffic engineering PIEV theory, Urban Traffic problems in India,	ectives and scope of	ОЬ.	
2	COI	er characteristics	Traffic Planning and Characteristics: Road Characteristics-Road user characteristics.	ffic Planning and C		Unit 1
0	0		Course Contents			
1	ming management.	affic conditions	Suggest preventive measures to avoid road accidents by analyzing traffic conditions	est preventive mean	-	CO4
. 1	affic me	ic control devices for tr	Outline the basic principles behind the design and placement of traffic control devices for traffic	ne the basic princip	-	CO3
1		or manne branning.	Design traffic intersections and signals considering traffic regulations	n traffic intersection		CO2
4		for traffic planning	Illustrate the traffic and its components, factors affecting road traffic for traffic planning	rate the traffic and	Illus	COI
	They want		its will be able to	Course Outcomes (CO): Students will be able to	urse Out	Cor
			Prerequisite: Basic knowledge of traffic controlling devices and regulatory signs.	: Basic knowledge	requisite	Pre
30 Min	Hrs	Duration of ESE 02				
	0			03	Total Credits	Tot
	0			00 Hrs/week	Tutorials	Tut
	0	MSE 20		03 Hrs/week	Lectures	Lec
	e	Examination Scheme		Scheme	Teaching So	Tes
		Engineering	CE3644: (Program Elective 01) Traffic Engineering		<i>‡</i>	=
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Guideline for Assessment Pattern(with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	5	4	20
Understand	5	4	
Apply	5	4	10
Analyse	1	4	20
Evaluate	5	4	10
Create	1		
TOTAL	20	20	60





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ation"	ive Evalu	destruct	Alten F. Grandt, "Fundamentals of Structural Integrity: Damage Tolerant Design and Nondestructive Evaluation"	dt, "Fundamentals of Structural Integ	en F. Granc	. Alte	-
					Reference Books	eferen	N
			uctures", MDPL 2021	Magdalena Rucka, "Non-Destructive Testing of Structures", MDPI.	gdalena Ru		2.
ospace.	l, and Aer	hanical	Phonge B. Doe, "Structural Health Monitoring and Non-Destructive Testing for Civil, Mechanical, and Aerospace Engineering Applications", MDPI Publications (Vol I). Jan2024	Phonge B. Doe, "Structural Health Monitoring and Non-Destruc Engineering Applications", MDPI Publications (Vol I). Jan2024	inge B. Doogineering A		-
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		sis of	Surface Waves (SASW), Digital Image Processing for crack detection	Surface Waves (SASW), Digital Image Processing for crack detection	Surface W		
) for	& Gamma-ray), Ground Penetrating Radar (GPR) for	subsurface investigation Acoustic Emission T	subsurfac		
(07)	C04		38		Advanced	Unit 6	
					structures		
		civil	Pulse Velocity (UPV),Infrared Thermography, Case studies of NDT applications in civil	locity (UPV),Infrared Thermography	Pulse Vel		
(07)	C04		Introduction to NDT and its role in civil engineering Rehound Hammer Test 1114-20-22	Introduction to NDT and its role in civil engineering Re	Introducti	omit o	6
			method, Core samples.	Lesting Techniques (NDT), destructive testing method, Core samples.	Lesting 1	l'nit A	=
(07)	CO4	ıctive	Damage assessment and Evaluation methods: Damage testing methods, Non-destructive	assessment and Evaluation methods	Damage	Unit 4	
					strategies		
		nance	vibration-based damage detection, Life-cycle assessment and predictive maintenance	-based damage detection, Life-cyc	vibration-		
(01)	000	s and	Damage detection methods: Model-based and data-driven approaches, Modal analysis and	detection methods: Model-based and	Damage (- 4
(07)	CO3		ssessment	Structural Damage Detection and Condition Assessment	Structura	Unit 3	
		CITICI	South Title Common of South Title	properties of building materials.	properties		
(06)	C02	mage,	case studies. Effects of climate, temperature. Corrosion. Strenoth Durability and Thormal	lies. Effects of climate, temperature.	case stud		,
				in load hearing RCC steel structure	Distress i	Unit 2	
		ncrete	and steel structures.	and steel structures.	and steel		
		n real	engineering and marine structures- Challenges in implementation of SHM scheme in real	ing and marine structures- Challenge	time scal		
(06)	C01	civil	-Necessity of monitoring health of c	l Health monitoring: Introduction-Necessity	Structural	Unit 1	_
Hours	CO.		Contents	Course Contents	1		
Š	Technique	NDT) T	Experimenting different Assessment Methods and Advanced Non-Destructive Testing (NDT) Techniques	ting different Assessment Methods a	Experimen	C04	
			Condition Assessment	Evaluation of Structural Damage Detection and Condition Assessment	Evaluation	CO3	
			Properties	Assessment of Structural Distress and Material Properties	Assessmen	CO2	
			HM)	Understanding Structural Health Monitoring (SHM)	Understand	COI	
				Course Outcomes (CO): Students will be able to	Outcomes	Course	0
				Prerequisite: Mechanics of Material, Strength of Material	uisite :Mec	Prerequ	***
ם	Hrs 30 Min		tion of ESE				1.
		60	ESE	3	redits 03	Total Credits	i
		20	ISE	00 Hrs/week		Tutorials	П
		20	MSE	03 Hrs/week		Lectures	
		leme	Examination Scheme		ng Scheme	Teaching	
		34	CE3654: (Program Elective 01) Structural Health monitoring	CE3654: (Program Electiv			
		,	I) B. Tech. Civil Engineering	Third Year (Sem - VI) B.			
			Government College of Engineering, Karad	Government Coll			1





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Guideline for Assessment Pattern(with revised Bloom's Taxonomy)

TOTAL 20	Create -	Evaluate 5	Analyse -	Apply 5	Understand 5	Remember 5	Knowledge Level MSE
20	1	4	4	4	4	4	ISE
60		10	20	10		20	ESE



(7)	СОЗ		Unit 5 Sew	
(7)	CO3	Characteristics & Conveyance c & stormwater: Dry Weather Flow (DWF) and Wet Weather Flow (WWF), of sewage, sewage flow variations, Characteristics of sewage (Physical, Chemical, al), Self-purification of water bodies, DO sag curve, Streeter-Phelps equation, standards for stream and land disposal (CPCB norms). Shapes, design parameters, operation & maintenance, sewer pumping, Sewerage and appurtenances, design of sewerage networks.	Donit 4 Sewage Domesti Quantity Biologic Effluent Sewers: systems	1
σ	CO2	of filters (slow sand, rapid sand, pressure filters) ler-drainage system. ng disinfection, methods (chlorination chemistry, exchange process. idation & defluoridation techniques		
(7)	CO1,	Water Treatment – I Concept of water treatment and flow diagram of a conventional treatment plant Aeration: Purpose, types of aerators, design of cascade aerator Coagulation & Flocculation: Theory, coagulants, dosing, jar test, flash mixer & mechanical flocculator design Sedimentation: Types of settling, sedimentation tank types, design principles & surface overflow rate. Tube & plate settlers: Concept and applications	Unit 2 Wai Con Aer Coa floc Sedi over	
9	COI	water quality parameters and significance in water treatment, water 10500), water demand for domestic and other purposes, factors ctuations in demand, rate of water consumption, design period and methods, components of a water supply system.		1
Hours	СО			
tion.	disinfect	Design water treatment processes, including aeration, coagulation, sedimentation, filtration, and disinfection. Analyze sewage characteristics, sewerage systems, and sewage treatment methods.	CO2 Desig	
		Course Outcomes (CO): Students will be able to COI Understand water sources, quality parameters, and supply system components.	- 6	T T
	UIIAI OC SI	Prerequisite: Basic Chemistry & Environmental Science	Prerequisite	T .
	20 14:5	ESE 60	Total Credits	
		03 Hrs/week MSE 20 00 Hrs/week ISE 20	Lectures Tutorials	
			Teaching Scheme	
		Third Year (Sem – VI) B. Tech. Civil Engineering CE3605: Environmental Engineering		-1
		Government College of Engineering, Karad		





s://npte Prof. M s://npte		Cen Syst	Min	M. L. 2012.	2. H. Edit	-	eferen	3. S. K	2. B. (Ltd.	1. B. o	Text Books	, , , , , , , , , , , , , , , , , , ,				4	Unit 6						
https://nptel.ac.in/courses/105/105/105105201/ NPTEL Course – Civil Engineering – Water Supply Engineering – By Prof. Manoj Kumar Tiwari, IIT Kharagpur https://nptel.ac.in/courses/105/105/105105048/ NPTEL Course – Civil Engineering – Wastewater Management –	Useful Links	Central Public Health and Environmental Engineering Organization, Manual on Sewerage and Sewage Treatment Systems, Part A. B. and C. Ministry of Urban Development, New Dalk: 2010	Ministry of Urban Development, Manual on Water Supply and Treatment, New Delhi, 2005.	M. L. Davis and A. Cornwell, Introduction to Environmental Engineering, 5th ed., McGraw-Hill, New York, 2012. (unit 1,2,3)	H. S. Peavy, D. R. Rowe, and G. Tchobanoglous, Environmental Engineering, McGraw-Hill International Editions, New York, 1985. (unit 1,2,3)	Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Tata McGraw-Hill, New Delhi, 2014. (unit 4,5,6)		S. K. Garg, Water Supply Engineering, Khanna Publishers, New Delhi, 2015. (unit 1,2,3)	B. C. Punmia and A. K. Jain, Environmental Engineering II, Wastewater Engineering, Laxmi Publications Pvt. Ltd., New Delhi, 2018. (unit 4,5,6)	B. C. Punmia, A. K. Jain, and A. K. Jain, Environmental Engineering I, Water Supply Engineering, Publications Pvt. Ltd., New Delhi, 2018.(unit 1,2,3))ks	Smart Water Management & IoT Applications: Real-time monitoring, leak detection, automation in treatment plants	Constructed Wetlands & Natural Treatment Systems: Phytoremediation, bio-filtration, green infrastructure solutions:	Advanced Oxidation Processes (AOPs): UV/H ₂ O ₂ , Ozone, Electrochemical oxidation;	water-scarce regions; I hermal & membrane-based desalination, applications in	ation (MF);	Advanced & Emerging Technologies in Water & Wastewater Treatment COA	lagoons;	Sludge Treatment: Characteristics, thickening, digestion, dewatering & disposal methods;	systems), secondary settling tank;	Primary Treatment: Screening, grit removal, oil & grease traps, primary settling tanks Secondary Treatment: Aerobic & anaerobic treatment (suspended & attached growth)	Overview of sewage treatment plants;	
ineerir		Treatn		lew Y	ernation	ew De			ations	ng, Laxmi	-			,		3	-					+	





CO 4	CO 3	CO 2	COI	CO J	1	PO
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		,	2			PO 7 PO 8 PO 9
1	-	1	1		10	РО
2	2	1	1		_	PO
3	ယ	သ	ယ			PSO
w	w	ယ	رى ر		2	PSO

Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	5	4	
Understand	5	4	
Apply	5	4	
Analyse	1	4	
Evaluate	5	4	
Create		ı	
TOTAL	20	20	



Prerequisite: Basic Civil Engineering, Building Material and Building Planning and Design. **Total Credits** Tutorials ectures Teaching Scheme 00 Hrs/week 02 Hrs/week Third Year (Sem - VI) B. Tech. Civil Engineering Government College of Engineering, Karad CE3606: (MDM IV) Building Services MSE ESE ISE **Examination Scheme Duration of ESE** 02 Hrs 30 Min 60 20

Course Outcomes (CO): Students will be able to

- Identify and draw various plumbing system components and electrical fitting components in buildings.
- National Building Code (SP-7) Knowledge and their application of ventilation systems, thermal insulation and fire resistance system as per
- Knowledge and their application of acoustics systems in buildings and sound insulation as per NBC (SP-7)
- Understand types of vertical circulation and paints in buildings and its suitability in public and residential building

		Consciona	Hours
_	Unit 1	Unit 1 Plumbing and electrification in buildings :Plumbing systems, material used for service pipes,	(05)
_		valves- function and types, fitting and taps, sanitary fittings- water closet, flushing cistern, wash	
_		basin, sink, urinals, traps- types and requirements, rain water harvesting system.	
_		Concealed and open wiring, requirements and location of various points, accessories of electrical	
_		installation, concept of earthing.	

- Unit 2 Unit 3 Fire protection in buildings: Selection criteria. Ventilation: - Definition and necessity of ventilation, functional requirement, various system and Air conditioning: - purpose, classification, principles, systems and various components of the same (05) (04)
- Unit 4 Introduction to acoustics: Absorption of sound, Acoustics and Sound Insulation in buildings: building materials and their resistance to fire Fire protection precautions, confining of fire, fire hazards, characteristics of fire resisting materials, various materials, conditions for good acoustics. (04)
- Unit 5 Unit 6 Thermal insulation and painting in buildings: Sound Insulation and methods of noise control Vertical Circulation in the Building: Different types and application methods. General concept, materials, methods Paints: (04) (04)
- Stairs: Technical terms, requirements of a good stair, uses, types, ramps, lifts and escalator.
- **Text Books**
- Building Design by Shah, Kale, Patki. Tata Mc-Graw Hill Publications. (Edition 2015) (All Units) Building Construction by B.C. Punmia (Edition 2015) (Unit 1,2,4,5,6)
- Building materials and construction by SS Bhavikatti. (All Units)
- Reference Books
- National Building code SP-7.(Edition 2016) (All Units)
 Building Services Handbook by Fred Hall and Roger Greeno (Unit 1,2,4,5)

Useful Links

https://ocw.mit.edu/courses/architecture/4-401-introduction-to-building-technology-spring-2006/lecture-notes/ (Unit 2,3)





CO 4	CO 3	CO 2	CO 1	CO ↓	1	РО
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1						PO 4
	i		ı			PO 5
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1	ı	1	1			PO 8
•	2		1			PO 9
	-		-		10	РО
•	-	-	1		_	РО
2	2	2	2		javved	PSO
2	2	2	2		N	PSO

Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	5	5	10
Understand	5	5	15
Apply	5 .	5	15
Analyse	-		
Evaluate	1		10
Create	5	5	20
TOTAL	20	20	60





		ledge	Prerequisite: Technical Knowledge	Prerequisite:
			01	Total Credits 01
50	ISE		02 Hrs/week	Practical
heme	Examination Scheme		ene	Teaching Scheme
		CE3607: Mini Project		
	ngineering	Third Year (Sem - VI) B. Tech. Civil Engineering		
	, Karad	Government College of Engineering, Karad	4	

Course Outcomes (CO): Students will be able to

COI	CO1 Perform detail literature survey on the project topic of work.	
CO2	CO2 Evaluate and analyze impact of a project that focuses on community issues.	
CO3	CO3 Develop communication and teamwork skills.	
CO4	CO4 Possess presentation and technical report writing skills.	

Course Contents

collaborative efforts and communication skills in students and also to make students aware with the process involved in making product from idea. main aim of this course is to demonstrate the important attributes like critical thinking, creativity,

survey, formulate the problem, propose and execute methodology. Project group consists of a minimum THREE and maximum FIVE students. The group is required to do literature

The steps involved for completion of mini project includes, but not limited to:

- Conceptualization of innovative idea through literature community or industry, socio economic survey etc. and market survey; site visits; interaction with
- Design of product, processes, methods and systems using multidisciplinary knowledge.
- Fabrication of product, development of software, measurement methods etc.
- Deployment, implementation and demonstration of project.
- Presentation of project.

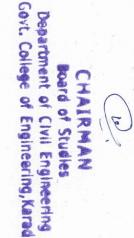
waste management system, etc. related to civil engineering. water supply schemes, irrigation schemes, smart transport system, smart cities, water harvesting, sewerage system, monitoring of structures, innovative civil engineering materials, Environmental impact assessment, design of small issues, computer based analysis and design, structural design, structural audit of various civil engineering works, health Mini projects shall consist of followings but not limited to Mini experimental work of various techno social

Project Report Format

For standardization of the project reports the following format should be strictly followed.

- Page Size: Trimmed A4
- Top Margin: 1.00 Inch
- Bottom Margin: 1.32 Inches
- 4 Left Margin: 1.5 Inches
- S Right Margin: 1.0 Inch
- 6. Para Text: Times New Roman 12 Point Font
- Line Spacing: 1.5 Lines
- Page Numbers: Right Aligned at Footer. Font 12 Point. Times New Roman
- Headings: Times New Roman, 14 Point Bold Face
- Certificate: All students should attach standard format of Certificate as described by the department. Certificate





Department and Principal/ Director. should be awarded to batch and not to individual student. Certificate should have signatures of Guide, Head of

11. Index of Report:

- Title Sheet
- Certificate
- Acknowledgement
- Table of Contents
- List of Figures
- List of Tables
- List of abbreviations

12.

- References: References should have the following format
- 13. For Books: "Title of Book", Authors, Publisher, Edition
- For Papers: "Title of Paper", Authors, Journal/Conference Details, Year

List of Submission

- Working model of the project
- 2 Project Report
- Presentation and demonstration of project in exhibition

Assessment Pattern

award the marks to the individual students depending on the group average awarded by the committee. committee. The presentation of the project shall be of 45min followed by viva voce. The committee members will members from the department along with Project Guide. The students will present their project work before the The assessment of the project will be done at the end of the semester by a committee consisting of three faculty

Each group will submit the copies of the completed project report. One copy will be kept in the departmental

Mapping of COs and POs

CO 4	CO 3	CO 2	CO 1	COŢ	PO →
-	1	2	2		PO I
_	2	w	ယ		PO2
2	2	ယ	1		PO 3
_	1	2	သ		PO 4
2	1	2	2		PO 5
1	2	3	1		PO 6
	1	2	1		PO7
2	ယ	2	2		PO 8
ယ	3	2	2		PO 9
2	2	2	1	10	РО
2	2	2	သ	1	РО
2	2	သ	ယ	-	PSO
2	2	ယ	သ	2	PSO

Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

TOTAL	Create	Evaluate	Analyse	Apply	Understand	Remember	Knowledge Level
25	5	. 5	5	5.	5	-	ISE
25	5	5	5	5	5	•	ESE





ry Schemidits dits dits dite: Build utcomes (ldculate value) pply differ sign struct epare wor ant 1 ant 2 ant 2	e drawn	y and other drawing sheets shall be	Minimum two drawing sheets shall be drawn manually and other drawing sheets shall be drawn	Minim	3.
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing 1.1a.b Examination Scheme: Calculate 2 Hrs/week 25 25			basis report.	Design	2 .
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing 1.1 ab Examination Scheme: Calculate 2 Hrs/week 1 25		ils and design consideration.	ll arrangement drawing with all geometric detai	Genera	٠.
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing 1.1 lab Examination Scheme: Calculate Learning				3.7	ast of Submission
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing. I Lab Fastory Scheme: Caredits 2 Hrs/week 25 25		o, drafting software like	AD.	n 1 1000 1000 1000 1000 1000 1000 1000	kequirement
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab ratory Scheme: Credits 2 Hrs/week 25 25		ons.	iled drawing of Gantry girder and its connection	3. Deta	
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab Examination Scheme: CHars/week 2 Hrs/week 25 25			l imperial size drawing sheet.	one ful	
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab Examination Scheme: 2 Hrs/week 2 Hrs/week Examination Scheme: 2 Hrs/week 25 25		column base and connections,	uled drawing for purlin, truss, beams, column, o	2. Deta	
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab ratory Scheme: Examination Scheme: Examination Scheme: Examination Scheme: Examination Scheme: Examination Scheme: ISE 25 Calculate: Response (CO): Students will be able to Calculate various loads on steel structures as per IS 800: 2007 and IS 875: 1987. Apply different methods of analysis to work out reactive forces in structure. Prepare working drawings in detail using advanced drafting tools. Course Contents Friment 1 Design of industrial steel structure. Design of industrial steel structure (Plan, Section and Elevation). Design of industrial steel structure in Expt. No.1 a C. Create a model using the software tool according to the architectural/municipal drawing. d. Creating and assigning material and section properties to the members in structure modelled. Examination Scheme: Examinatio		ns and sections reference to	ctural drawings showing plan, all side elevation	1. Struc	
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab Fratory Scheme: I 2 Hrs/week Examination Scheme: I Credits I Examination Scheme: I Credits I Examination Scheme: Second Heaving Planning and drawing, Analysis of structure, Design of steel structures. Second Heaving Planning and drawing, Analysis of structure, Design of steel structures. Second Heaving Planning and drawing, Analysis of structure, Design of steel structure. Apply different methods of analysis to work out reactive forces in structure. Design structural components of buildings according to the response from analysis of structure. Prepare working drawings in detail using advanced drafting tools. Course Contents Course Contents Third Year (Sem – VI) B. Tech. Civil Engineering I Lab Examination Scheme: Examina	C04		e drawings:	Prepar	Experiment 2
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab ratory Scheme: Examination Scheme: Examination Scheme: ISE 25	CO3		ign of connections.	1000	
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab Examination Scheme: 1	C02	command and execution of I members.	ulysis and design by performing Run Analysis c ware and finalization of the design of structural		
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab Examination Scheme: Examination Scheme: ISE 25 Credits 2 Hrs/week 225 Credits 1 Examination Scheme:	C02	n Expt. 1b) as per IS 800: 2007	oly loads on members of structure (calculated in IS 875: 1987.	1	
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab Examination Scheme: Examination Scheme: Examination Scheme: ISE 25 ICredits I 2 Hrs/week I 2 Hrs	202	rues to the members m	cture modelled.		
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab ratory Scheme: CE3608: Structural design and drawing I Lab	COZ	o me aremtectura/municipal	wing.		
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab Examination Scheme: Examination Scheme:		red in Expt. No.1 a	try girder, column, beam, column base conside		
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab ratory Scheme: CE3608: Structural design and drawing I Lab		ers like purlin roof truss	IS 800: 2007 and IS 875: 1987. Id calculations of the loads on structural membe	per Har	
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab ratory Scheme: CE3608: Structural design and drawing I Lab		Load and load combinations as	d Calculations: Dead load, Live Load, Wind I		
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab reatory Scheme: CE3608: Structural design and drawing I Lab	COI	industrial steel structure (Plan,	.w/Collect Architectural/Municipal drawing of ition and Elevation).		
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab reatory Scheme: CE3608: Structural design and drawing I Lab			of industrial steel structure.	Design	Experiment 1
	00	OOIS.	Course Contents	9	H
	re.	sponse from analysis of structu	rawings in detail using advanced drafting to	orking di	
Third Year (Sem – VI) B. Tech. Civil Eng CE3608: Structural design and drawing attical Credits 1 Credits 1 Calculate various loads on steel structures as per IS 800: 2007 ar		es in structure.	thods of analysis to work out reactive force	erent me	
CE3608: Structural design and drawing cheme: 2 Hrs/week 1		7 and IS 875: 1987.	oads on steel structures as per IS 800: 2007	various l	
Third Year (Sem – VI) B. Tech. Civil Eng CE3608: Structural design and drawing cheme: 2 Hrs/week 1		Design of steel structure.	nning and drawing, Analysis of structure, I tudents will be able to	ding pla	rerequisite: Bui
CE3608: Structural design and drawing cheme: 2 Hrs/week					otal Credits
Third Year (Sem – VI) B. Tech. Civil Eng CE3608: Structural design and drawing		ISE 25	Hrs/week	1 2	ractical
Third Year (Sem – VI) B. Tech. Civil Engineering CE3608: Structural design and drawing I Lab		Examination Scheme:			aboratory Scher
Third Year (Sem - VI) B. Tech. Civil Engineering		ing I Lab	CE3608: Structural design and draw		
		Ingineering	Third Year (Sem - VI) B. Tech. Civil F		





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Medium)	1	1	1	1			9 PO 6
٠.	1	1	1	1			PO7
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ntial (Hic	2	1	1	1			PO 9
rh)	1		,				PO 10
	2	2	2	3			PO 11
	2	2	2	2			PSO 1
	2	2	2	2			PSO 2

3: Substantial (High)

Guideline for Assessment Pattern:

ISE .	Task III	Task II	Task I	Skill Level (as per CAS Sheet)
25	10	10	05	Exp 1
25	10	10	0.5	Exp 2
25	10	10	05	Avg.



				ion:	List of Submission:
C04	ial/	led valuation report for resident	Carrying out valuation and preparing detailed valuation report for residential commercial/ industrial buildings using standard format.	Carry	Assignment 10
C03	tailed	G + 1 building for which the de	Preparing tender notice for construction of $G + 1$ building for which the detailed estimate is prepared.	estim	Assignment 9
CO3	10.		embankment, drainage system (any two).	emba	
CO2,	culvert, road,	res other than building such as	Preparing detailed estimate for civil structures other than building such as culvert, road,	Prepa	Assignment 8
CO2		or RCC work: staircase.	Preparation of schedule of reinforcement for RCC work: staircase	Prepa	Assignment 7
CO2		or RCC work: beams and slabs.	Preparation of schedule of reinforcement for RCC work: beams and slabs.	Prepa	Assignment 6
C02	ng.	or RCC work: column and footi	Preparation of schedule of reinforcement for RCC work: column and footing	Prepa	Assignment 5
CO2	ring works.	work from various civil enginee	Prepare detailed rate analysis for items of work from various civil engineering works. (At least 10 items).	(At le	Assignment 4
CO2		(AutoCAD software.	Auto	
CO1,	cel and	+ 1 building and use M.S. Ex	Prepare a Detailed estimate of RCC G + 1 building and use M.S. Excel and	Prep	Assignment 3
C01	approximate	ouilding by any two methods of	Carry out approximate estimate for $G+1$ building by any two methods of approximate estimate.	Carry or estimate	Assignment 2
	and sewer	ks, water supply and sanitation	(each from buildings, roads, irrigation works, water supply and sanitation and sewer from buildings)	(each from	
60	ering works	work from various civil engine	Writing detailed specifications for items of work from various civil engineering works	Writi	Assignment 1
6		S	Course Contents		-
		fixation	Carry out valuation of immovable properties and rent fixation.	ıt valua	CO4 Carry ou
			Prepare tender document of construction projects.	tender (CO3 Prepare
		analysis.	Calculate the quantity of materials and carry out rate analysis.	e the q	CO2 Calculat
		il engineering works	prepare quantity estimates for buildings and other civil engineering works	quantit	CO1 prepare
			Course Outcomes (CO): Students will be able to	nes (Ct	ourse Outcon
	æ.	nd Design, AutoCAD, M.S Office.	Prerequisite: Basic Civil Engineering, Building Planning and Design, AutoCAD,	asic Ci	erequisite: B
	25	ESE	1		Total Credits
	25	ISE	2 Hrs/week		Practical
	Scheme:	Examination Scheme:		heme:	Laboratory Scheme:
		ing and Valuation Lab	CE3609: Quantity Surveying and Valuation Lab		7
		3. Tech. Civil Engineering	Third Year (Semester - VI) B. Tech. Civil Engineering		
		Engineering, Karad	Government College of Engineering, Karad		

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Moderate	-	. 1	-					PO 4
rate (Medium)	2	1	2	2	,			PO 2 PO 3 PO 4 PO 5
dium)	(J	2	-	2				PO 6
		2	1	1				PO7
3. Sinhete	-	1	1					PO6 PO7 PO8
· Substantial (High)	2	2	2					PO 9
44)	3	3	S	ယ				
	2	1	2	2				PO 10 PO 11
		2	1	1				PSO
		1	ı				(PSO 2

5: Substantial (High)





Guideline for Assessment Pattern:

ISE	Task III	Task II	Task I	Skill Level (as per CAS Sheet)
25	05	05	15	S Exp
25	05	05	15	Exp 2
25	05	05	15	Exp 3
25	05	05	15	Exp 4
25	05	05	15	Exp 5
25	05	05	15	Exp 6
25	05	05	15	Exp 7
25	05	05	15	Exp 8
25	05	05	15	Exp 9
25	05	05	15	Exp 10
25	05	05	15	Avg



			f Experiments · 10	Minimum number of Experiments · 10	
					List of Submission:
C04	ory (BGRL),	search Laborato	Educational Lab Visit at Borehole Geophysical Research Laboratory (BGRL), Karad	Educational Lab V Karad	Experiment 12
CO3	ware	ing GemPy Softv	3D Structural & Probabilistic Geological Modelling using GemPy Software	3D Structural & Pro	Experiment 11
CO3			Tunnel Support Analysis by OTSA Software	Tunnel Support Ana	Experiment 10
CO3			Slope Stability Analysis by HYRCAN 1.0 Software	Slope Stability Anal	
CO3		74 M			
CO2,		иe	Rock Mass Strength Calculation using ORMAS software	Rock Mass Strength	Experiment 8
CO3				in 1x1D software.	
CO2,	alysis of data	er estimation, an	Electrical Resistivity Survey for hard rock/ groundwater estimation, analysis of data	Electrical Resistivity	Experiment 7
CO3		/are	software or by using Borehole plugging in QGIS Software	software or by using	
CO2,	by LogPlot	ological sections	Borehole logging Problem solving and creating geological sections by LogPlot	Borehole logging F	Experiment 6
C01	o identify the	thin sections to	Optical Petrography: Microscopic Study of Concrete thin sections to identify the reactive mineral phase leading to alkali aggregate reaction	Optical Petrography reactive mineral pha	Experiment 5
			, Quartzite etc	Amphibolite, Gneiss, Quartzite etc	
CO1	Rocks: Schist,	Metamorphic Ro	Microscopic Study of	Optical Petrography:	Experiment 4
2	. Danasione,		or Senat or		
601	· Sandstone	Sedimentary Rocks:	Microscopic Study of	Optical Petrography:	Experiment 3
COI	ite, Dolerite,	s Rocks : Gran	Optical Petrography: Microscopic Study of Igneous Rocks : Granite, Norite, Gabbro, Basalt	Optical Petrography: Norite, Gabbro, Basalt	Experiment 2
		e, Olivine, Mica	Orthoclase, Plagioclase Feldspar, Amphibole, Pyroxene, Olivine, Mica	Orthoclase, Plagiocl	
COI	erals: Quartz,	k forming Minerals:	Optical Mineralogy: Identification of Common rock forming	Optical Mineralogy	Experiment 1
СО			Course Contents		
			Understand ongoing research in the field of Engineering Geology	ngoing research in th	CO4 Understand or
		gy problems	Utilise various open-source software's for solving engineering geology problems	s open-source softw	CO3 Utilise variou
			Create subsurface models using geophysical and drilling techniques	face models using go	CO2 Create subsur
			scale	Identify the rocks on microscopic scale	CO1 Identify the ro
			e able to	O): Students will b	Course Outcomes (CO): Students will be able
				ience	Prerequisite: Geoscience
				_	Total Credits
	25	ISE		2 Hrs/week	Practical
	Scheme:	Examination Scheme:			ry Schem
	ogy Lab	incering Geole	3610: (Program Elective 01 Lab) Advanced Engineering Geology Lab	610: (Program E	CE 3
		igineering	Third Year (Sem -VI) B. Tech. Civil Engineering	Third Yes	
		Narad	GOVERNMENT CONEGE OF ENGINEERING, Narau	COLUM	





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	04	3	300	3	COI	COT		+	PO
1: Slight(Low)		7) [S	2				PO I
Cow)	_	-		٥	2				PO 2
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ate(Medium	2	2	2		2				PO 5
lium)		2			_				PO 6
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3: Substantial(High)		2	1						PO 0
h)		1						1010	POI POZ PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11
				-				1101	I Od
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	-	1	-	1	-			1002	DCO 2

Guideline for Assessment Pattern:

ISE	Task III	Task II	Task I	Skill Level (as per CAS Sheet)	
				el (as CAS	
25	05	05	15	Exp 1	
25	05	05	15	Exp 2	
25	05	05	15	Exp 3	
25	05	05	15	Exp 4	
25	05	05	15	Exp 5	
25	05	05	15	Exp 6	
25	05	05	15	Exp 7	
25	05	05	15	Exp 8	
25	05	05	15	Exp 9	
25	05	05	15	Exp 10	
25	05	05	15	Avg	



CO2 Department 2 Department 2 CO3 Analyse water quality and demonstration of plumbing of air conditioning units. Electricent 4 Performance testing of air conditioning units. Electricent 5 Experiment 6 Demonstration of lift and escalator operation and safety. Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO2, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO2, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 6 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network, vertical circulation. CO3, Experiment 9 Visit to a public system to understand plumbing network vertical circulation. CO3, Experiment 10 Visit to a public system to the p			Minimum number of Experiments: 08	20. 10. 10.	1.
CE3620 : (Program Elective 01 Lab) Building Services lab theme: 2 Hrs/week Examination Scheme: Examination Scheme:				0577	List of Submissi
Covernment College of Engineering, Karad Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab theme: 2 Hrs/week 2 Hrs/week 1 ISE 2 Hrs/week 2 Hrs/week 2 Hrs/week 2 Hrs/week 5 fire extinguisher 6 water quality. correct plumbing fixtures. Course Contents Study and demonstration of plumbing fixtures and layout. Analysis of water quality and flow measurement in pipelines. Electrical wiring and circuit testing in buildings. Performance testing of air conditioning units. Fire safety drill and demonstration of alarm systems. Study of building management systems (BMS) and automation. Visit to any public building to observe and understand the fire-fighting system.	CO3	culation.	public system to understand plumbing network, vertical circ	Visit to a p	Experiment 10
Covernment College of Engineering, Karad Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 2 Hrs/week 1 Examination Scheme: 2 Examination Scheme: 3 Examination Scheme: 4 Examination Scheme: 4 Examination	CO3	ng system.	y public building to observe and understand the fire-fighting	Visit to an	Experiment 9
Third Year (Sem – VI) B. Tech. Civil Engineering, Karad CE3620: (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week Examination Scheme:	CO3			X7: -:	
Covernment College of Engineering, Karad Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 2 Hrs/week 1 Basic knowledge of plumbing accessories, fixtures, firefighting system, electrical components mes (CO): Students will be able to lumbing layout for a building. a fire extinguisher e water quality. correct plumbing fixtures. Course Contents Study and demonstration of plumbing fixtures and layout. Analysis of water quality and flow measurement in pipelines. Electrical wiring and circuit testing in buildings. Performance testing of air conditioning units. Fire safety drill and demonstration of alarm systems. Demonstration of lift and escalator operation and safety. Energy audit and efficiency analysis of lighting systems.	C02,		uilding management systems (BMS) and automation.	Study of b	Experiment 8
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620 : (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 1 1	CO2		dit and efficiency analysis of lighting systems.	Energy au	Experiment 7
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620 : (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 1 Examination Scheme: 2 Hrs/week 1 ISE 25 Basic knowledge of plumbing accessories, fixtures, firefighting system, electrical components mes (CO): Students will be able to lumbing layout for a building. e water quality. correct plumbing fixtures. Course Contents Study and demonstration of plumbing fixtures and layout. Analysis of water quality and flow measurement in pipelines. Electrical wiring and circuit testing in buildings. Fire safety drill and demonstration of alarm systems.	C02		ation of lift and escalator operation and safety.	Demonstr	Experiment 6
CE3620 : (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 2	CO2)	
Covernment College of Engineering, Karad Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 2 Hrs/week 1 1 2 Hrs/week 1 Students will be able to lumbing layout for a building. e fire extinguisher e water quality. correct plumbing fixtures. Course Contents Study and demonstration of plumbing fixtures and layout. Analysis of water quality and flow measurement in pipelines. Electrical wiring and circuit testing in buildings. Performance testing of air conditioning units.	COL		drill and demonstration of alarm systems.	Fire safety	Experiment 5
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 1 1 Examination Scheme: 2 Hrs/week 1 1 Examination Scheme: 1 SE 25 Basic knowledge of plumbing accessories, fixtures, firefighting system, electrical components mes (CO): Students will be able to plumbing layout for a building. e fire extinguisher e water quality. Course Contents Study and demonstration of plumbing fixtures and layout. Analysis of water quality and flow measurement in pipelines. Electrical wiring and circuit testing in buildings.	CO2		ace testing of air conditioning units.	Performar	Experiment 4
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 1 Examination Scheme: 2 Hrs/week 1 Examination Scheme: 2 Students will be able to plumbing layout for a building. e fire extinguisher water quality. Course Contents Study and demonstration of plumbing fixtures and layout. Analysis of water quality and flow measurement in pipelines.	CO2		wiring and circuit testing in buildings.	Electrical	Experiment 3
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab cheme: 2 Hrs/week 1 Examination Scheme: 2 Hrs/week 1 Examination Scheme: 2 Study and demonstration of plumbing fixtures and layout.	COI		of water quality and flow measurement in pipelines.	Analysis	Experiment 2
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab ratory Scheme: Credits	COI		demonstration of plumbing fixtures and layout.	Study and	Experiment 1
Third Year (Sem – VI) B. Tech. Civil Engineering Laboratory Scheme: Practical 2 Hrs/week Cotal Credits 1 Prerequisite :Basic knowledge of plumbing accessories, fixtures, firefighting system, electrical components in Course Outcomes (CO): Students will be able to Operate fire extinguisher Od Select correct plumbing fixtures.	CO		Course Contents		
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab Laboratory Scheme: Practical 2 Hrs/week Examination Scheme: Cotal Credits 1 ISE 25 Course Outcomes (CO): Students will be able to Operate fire extinguisher Cotal Course Quality.			fixtures.	rect plumbing	CO4 Select cor
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab Laboratory Scheme: Practical 2 Hrs/week 2 Hrs/week 1 Examination Scheme: Prerequisite: Basic knowledge of plumbing accessories, fixtures, firefighting system, electrical components in Duilding Students will be able to Ourse Outcomes (CO): Students will be able to Operate fire extinguisher				vater quality.	
CE3620 : (Program Elective 01 Lab) Building Services lab				ire extinguishe	CO2 Operate fi
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab Aboratory Scheme: Practical 2 Hrs/week Cotal Credits 1 Prerequisite: Basic knowledge of plumbing accessories, fixtures, firefighting system, electrical components in Duilding Course Outcomes (CO): Students will be able to			or a building.	mbing layout for	CO1 Draw plu
Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab Aboratory Scheme: Practical 2 Hrs/week Fotal Credits 1 Prerequisite: Basic knowledge of plumbing accessories, fixtures, firefighting system, electrical components in			ents will be able to	es (CO): Stude	Course Outcom
CE3620 : (Program Elective 01 Lab) Building cheme: 2 Hrs/week	nts in	rical componer	of plumbing accessories, fixtures, firefighting system, electri	sic knowledge	Prerequisite :Ba building
CE3620: (Program Elective 01 Lab) Building cheme: 2 Hrs/week 1					
Third Year (Sem – VI) B. Tech. Civil Eng CE3620: (Program Elective 01 Lab) Building ry Scheme: 2 Hrs/week				1	Total Credits
Government College of Engineering, F Third Year (Sem – VI) B. Tech. Civil Eng CE3620 : (Program Elective 01 Lab) Building		25		2 Hr	Practical
Government College of Engineering, Karad Third Year (Sem – VI) B. Tech. Civil Engineering CE3620: (Program Elective 01 Lab) Building Services lab		Scheme:	Examination S		Laboratory Sch
Government College of Engineering, Karad Third Year (Sem – VI) B. Tech. Civil Engineering			20 : (Program Elective 01 Lab) Building Services lab	CE36:	
Government College of Engineering, Karad			hird Year (Sem - VI) B. Tech. Civil Engineering	j	
			Government College of Engineering, Karad		

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dium)	•	2	w	2				PO 6
	-	1	1	-				PO 7
3: Subst	w	1	1	•				8 Od
3: Substantial(High)	2	1	2	1				PO 9
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	3	2	2	2				PO II
	2	2	1	2				PSO
	2	1	ယ	3				PSO 2



Guideline for Assessment Pattern:

ISE 25	K III	Task II 05	Task I 15	Skill Level (as per CAS Exp Sheet)
25	05	05	15	Exp 2
25	05	05	15	Exp 3
25	0.5	05	15	Exp 4
25	05	05	15	Exp 5
25	05	05	15	Exp 6
25	05	05	15	Exp 7
25	05	05	15	Exp 8
25	05	05	15	Exp 9
25	05	05	15	Exp 10
25	05	05	15	Avg





	Third Vo	Third Von (Competer V) B Tech Civil E.	37	
CE	3630 : (Program E)	CE3630 : (Program Elective 01 Lab) Analysis of Indeterminate Structure Lab	eterminate Structur	e Lab
Laboratory Scheme	ne O2 Hrs/wash		Examination Scheme	me
Total Credits	01		A COL	10
rerequisite : Stru	uctural Mechanics, An	Prerequisite: Structural Mechanics, Analysis of Indeterminate structures,		
Course Outcomes	Course Outcomes (CO): Students will be able to	e able to		
CO1 Analy	se energy theorem for	Analyse energy theorem for statically indeterminate beam, truss and parabolic arch.	and parabolic arch.	
CO2 Apply	knowledge of mathe	Apply knowledge of mathematics and engineering in calculating slope, deflection, shear force using slope deflection moment distribution method and Koni's method.	ň,	bending moment and
CO3 Deterr	nine the effect of supr	Determine the effect of support settlements for indeterminate structures	michires	
CO4 Calcul	late the nodal displace	Calculate the nodal displacements and member forces by using force and matrix methods	force and matrix methor	ods.
		Course Contents		co
Experiment 1	Examples on Castiglione"s beam.	one"s theorem and unit load method for statically	thod for statically inc	indeterminate CO1
Experiment 2	Examples on analysis	Examples on analysis of truss (lack of fit and temperature variation effect) and two hinged	variation effect) and	
Experiment 3	Examples on analysis	Examples on analysis of beams, sinking of supports, portal frames with sway and non sway.	frames with sway and	-
	by using slope deflection method.	on method.	ii ii aines witti sway ain	CO2,
Experiment 4	Examples on analysis of beams, sinking of by using modified slope deflection method	Examples on analysis of beams, sinking of supports, portal frames with sway and non sway by using modified slope deflection method	I frames with sway and	
Experiment 5	Examples on analysis	Examples on analysis of beams, sinking of supports, portal frames with sway by using	ortal frames with swa	
-	Examples on analysis of ha	file.		CO3
	moment distributed method.	moment distributed method.	al frames with non swa	ay by using CO2,
Experiment / 1	Examples on analysis Kani's Method.	Examples on analysis of beams, sinking of supports, portal frames Kani's Method.	ortal frames with sway	y by using CO2,
Experiment 8 I	Examples on analysis Kani's Method.	Examples on analysis of beams, sinking of supports, portal frames with non sway by using Kani's Method.	al frames with non swa	
Experiment 9 t	Examples on analysis of three moment theorem.	Examples on analysis of beam, beam with different flexural rigidity by using Clapeyeron"s three moment theorem.	al rigidity by using Cl	
Experiment 10 I	Examples on analysis moment theorem.	of beam with sinking of support	rt by using Clapeyeron"s	on"s three CO4
Experiment 11 I	Examples on to develor cortal frames by using	Examples on to develop flexibility coefficient matrix, proportal frames by using flexibility matrix method.	problems on analysis of	of beams and CO4
Experiment 12	Examples on to devel cortal frames by using	Examples on to develop stiffness coefficient matrix, problems on analysis of beams and portal frames by using stiffness matrix method.	blems on analysis of	beams and CO4
List of Submission:				





CO 4	CO 3	CO 2	CO 1	СО↓	→ PO
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S	S	w	w		PO 2
2	2	2	2		PO 3
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	1	1			PO 7
1	1	1	1		PO 7 PO 8 PO 9
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	r	1	1	1	РО
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1	-	_	1	1	PSO

Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

ISE	Task III	Task II	Task I	Skill Level (as per CAS Sheet)
25	05	05	1	Exp 1
25	05	05	15	Exp 2
25	05	05	15	Exp 3
25	05	05	15	Exp 4
25	05	05	15	Exp 5
25	05	05	15	Exp 6
25	05	05	15	Exp 7
25	05	05	15	Exp 8
25	05	05	15	Exp 9
25	05	05	15	Exp 10
25	05	05	15	Exp 11
25	05	05	15	Exp 12
25	05	05	15	Avg





	Governn	Government College of Engineering, Karad		
	Third Year	Third Year (Sem - VI) B. Tech. Civil Engineering	ng	
	CE3640: (Progra	CE3640: (Program Elective 01 Lab) Traffic Engineering	ing Lab	
Laboratory Scheme:	-80	Exam	Examination Scheme:	
Practical	2 Hrs/week	ISE	25	
Total Credits	1			
Prerequisite:				
Course Outcomes	Course Outcomes (CO): Students will be able to	able to		
CO1 Analyse traf	Analyse traffic volume count on at variable time	ariable time.		
CO2 Prepare the specific area	report on traffic patter a.	Prepare the report on traffic pattern in specific area, working of traffic signals, causes of accidents in specific area.	gnals, causes of accide	ents in a
CO3 Suggest app	Suggest appropriate parking system			
-	Draw collision diagram on accidents	5.		
		Course Contents		00
Experiment 1	Measure the traffic vo	Measure the traffic volume in morning peak hour to analyze traffic composition on	affic composition on	COI
	the road way.		•	
Experiment 2	Measure the traffic vo	Measure the traffic volume in morning peak hour to analyze traffic composition at	affic composition at	COI
	intersection.			
Experiment 3	Measure the traffic v	Measure the traffic volume in non-peak hours to analyze traffic composition at	affic composition at	CO2
	intersection.			
Experiment 4	Prepare a report of trip	Prepare a report of trip generation and trip attraction between two zones on the basis	o zones on the basis	C02
	of origin-destination s	of origin-destination study within area of your town/city.		
Experiment 5	To suggest relevant	To suggest relevant vehicle parking system for your campus	us along with your	COI,
Evneriment 6	To propose a society of	o field wight to an aroport.		202
ехретинен о	identify the type, work	identify the type, working of traffic signals along with your recommendations	n in your locality to mimendations	CO2
Experiment 7	Draw the collision dia	Draw the collision diagram for any case study of road accident.		C02
Experiment 8	Prepare a report of a fi	Prepare a report of a field visit to any road intersection in your locality to identify its	ocality to identify its	CO2.
	type along with its sketch	tch.	•	CO3
Experiment 9	Draw the collision dia	Draw the collision diagram for any case study of road accident.		CO3
Experiment 10	Prepare the report on	Prepare the report on the causes of accident and preventive measures suggested by	asures suggested by	CO3
		practical no. 10		
List of Submission:				
1.	Minimum number of Experiments: 08	Experiments: 08		

	CO4	CO3	CO2	000	CO↓		PO
1: S		. 0	2)	←		
1: Slight(Low	S	2	U.	-		ř	PO I
Low)	2	ω	4				PO 2
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:: Mode		ı	1	2			PO 4
2: Moderate(Medium)			2	2			PO 5
fium)	2	2	ယ	w			PO 6
	1	2	2				PO 7
Substa	ı	သ	1	1			8 Od
3: Substantial (High	2	3		2			PO 9
5	2	2	2	3			PO 10
	2	I	2	3			PO 11
	ယ	1	2	2			PSO I
	2	2	ယ	1			PSO 2



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Guideline for Assessment Pattern:

25 25 25	Task III 05 05 05 05	Task II 05 05 05 05	15 15 15 15	per CAS Exp Exp Exp Exp Sheet) Exp Exp Exp A Ex
4				
25	05	05	15	Exp 1
25	05	05	15	Exp 2
25	05	05	15	Exp 3
. 25	05	05	15	Exp 4
25	05	05	15	Exp
25	05	05	15	Exp 6
25	05	05	15	Exp 7
25	05	05	15	Exp 8
25	05	05	15	Exp 9
25	05	05	15	Exp 10
25	05	05	15	Avg



	Or	
	for Crack Detection	
C02	Introduction to acoustic emission techniques and use of Acoustic Emission Testing	Experiment 8
C02	Determine the size; depth and location of reinforcing bar using Rebar locator of any two structural elements such as column, beam, slab etc. for damaged or undamaged structure.	Experiment 7
CO1,	Determine the corrosion of reinforcing bar using Half-cell Potentiometer of any two structural elements such as column, beam, slab etc. for damaged or undamaged structure.	Experiment 6
C02	Determine the bond strength of any one structural element such as column, beam, and slab etc. using pull out test.	Experiment 5
C02	Determine the crack nature of any two structural elements such as column, beam, slab etc. for damaged or undamaged structure using Ultrasonic Pulse Velocity (UPV) Test	Experiment 4
C01	Determine the compressive strength of any two structural elements such as column, beam, slab etc. for damaged or undamaged structure using Rebound Hammer.	Experiment 3
	Use of drones and cameras for structural assessment	
	Or	
C01	Introduction of Image-Based Monitoring for Experimental Analysis	Experiment 2
	Introduction of Basics of sensors, transducers, and data acquisition	
	Or	
COI	Introduction to NDT and SHM, Overview of NDT methods and SHM techniques	Experiment 1
3	Course Contents	
structural	Develop technical reports and recommendations based on experimental findings for real-world structural health evaluation.	CO4 Develop technica health evaluation.
	(structural
different	Utilize advanced sensors and imaging technologies for damage detection and assessment in different	CO3 Utilize ad
osion, and	other structural defects.	-
	ands-on experiments to measure analyses and interment data for different	CO2 Perform h
ng (SHM)	Understand and apply various Non-Destructive Testing (NDT) and Structural Health Monitoring (SHM) techniques for evaluating material and structural integrity.	CO1 Understan
	Course Outcomes (CO): Students will be able to	Course Outcome
	Prerequisite: Mechanics of Material, Strength of Material	Prerequisite : Ma
		Total Credits
	2 Hrs/week	Practical
	me: Examination Scheme:	Laboratory Scheme:
	CE3650: (Program Elective 01 Lab) Structural Health monitoring lab	
	Third Year (Sem – VI) B. Tech. Civil Engineering	
	Government College of Engineering, Karad	





	Minimum number of Experiments : 06	
		List of Submission:
C04	such as dams, bridges, industrial buildings etc.	Experiment 11
	Displacement Monitoring	Fernanda
CO3	Real-Time Data Collection and Analysis Using LVDT Sensors for Precision	Experiment 10
	undamaged structure.	
CO3	indicator of any two structural elements such as column, beam, slab etc. for	
C02,	Determine the depth of carbonation of concrete using phenolphthalein	Experiment 9
	Acoustic Emission Testing	
	Introduction to Ground Penetrating Radar (GPR) for subsurface investigation	

1: S		8 8	000	00	100	3	CO 1	1	РО
1: Slight(Low)) 1	2	^				PO 1
W)	-	-		S	~	,			PO 2
2: 1	_	-		-	_				PO 3
Moderat	2	2	1	٥	2				PO 4
2: Moderate(Medium)	2	2	7	J	2				PO 5
m)	2	2	7)	2				PO 6
3:	1	1	-		-				PO 7
Substan			,						PO 8
3: Substantial(High)	1	3	ω	,	1				PO 9
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Guideline for Assessment Pattern:

ISE	Task III	Task II	Task I	Skill Level (as per CAS Sheet)
25	05	05	15	
25	05	05	15	Exp 2
25	05	05	15	Exp 3
25	05	05	15	Exp
25	05	05	15	Exp 5
25	05	05	15	Exp 6
25	05	05	15	Exp 7
25	05	05	15	Exp 8
25	05	05	15	Exp 9
25	05	05	15	Exp 10
25	05	05	15	Avg



hem hem hem said said said said said said said said		Plant.	Visit report with details and layout of Water and Wastewater Treatment Plant.	and layout of Water	sit report with detail:	3. Vi	
CO2 Interpret real-world water and wastewater. Experiment 1 Determination of PH of horders. Experiment 1 Determination of Solids: settable; susperiment 1 Determination of Optimum coagulant dose for turbidity removal by using jar test. CO2 Experiment 1 Determination of Solids: experiment 1 Determination of Do of wastewater. Experiment 1 Determination of Solids: experiment 2 Determination of Do of wastewater. Determination of Do of wastewater. CO2 Experiment 1 Determination of Solids: settable; suspended, dissolved, volatile and fixed solids of CO2 Experiment 2 Determination of Solids: settable; suspended, dissolved, volatile and fixed solids of CO2 Experiment 2 Determination of Solids: settable; suspended, dissolved, volatile and fixed solids of CO2 Experiment 1 Determination of Do of wastewater. CO3 Experiment 2 Determination of Solids: settable, suspended, dissolved, volatile and fixed solids of CO2 Experiment 1 Determination of DO of wastewater. CO3 Experiment 1 Determination of DO of wastewater. CO3 Experiment 1 Determination of Solids: settable, suspended, dissolved, volatile and fixed solids of CO2 Experiment 1 Determination of DO of wastewater. CO3 Experiment 1 Determination of Solids: settable, suspended, dissolved, volatile and fixed solids of CO2 Experiment 1 Determination of Solids: settable, suspended, dissolved, volatile and fixed solids of CO2 Experiment 1 Determination of Solids: settable, suspended, dissolved, volatile and fixed solids of CO3 Experiment 1 Determination of Solids: settable, suspended, dissolved, volatile and fixed solids of CO3 Experiment 1 Determination of Solids: settable, suspended, dissolved, volatile and fixed solids of CO3 Experiment 1 Determination of Solids: settable, suspended, dissolved, volatile and fixed solids of CO3 Experiment 1 Determination of Solids: solidation of Solids: solidation of Solidation of Solidation of Solidation of Solidation of Solidation of Solidat			dard formats	Experiments in stan	rite-ups of specified		
COV Experiment 2 Determination of Alkalinity of water and wastewater. Experiment 2 Experiment 3 Determination of Soldis: settable, suspended, dissolved, volatile and fixed solids of Experiment 10 Determination of COD of wastewater. Experiment 1 Determination of COD of wastewater freatment plant and sewage treatment plant. CO2 Experiment 1 Determination of COD of wastewater freatment of CO2 Determination of COD of wastewater and sewage treatment plant. CO3 Experiment 1 Determination of OCD of wastewater. CO3 Experiment 2 Determination of OCD of wastewater. CO3 Experiment 3 Determination of Soldis: settable, suspended, dissolved, volatile and fixed solids of CO2 Experiment 5 Determination of OCD of wastewater. CO3 Experiment 6 Determination of OCD of wastewater. CO3 Experiment 1 Determination of OCD of wastewater. CO3 Experiment 1 Determination of OCD of wastewater. CO3 Experiment 2 Determination of OCD of wastewater. CO3 Experiment 1 Determination of OCD of wastewater. CO3 Experiment 1 Determination of COD of wastewater. CO3 Experiment 1 Determination of COD of wastewater. CO3 CO3 Experiment 1 Determination of COD of wastewater. CO3 CO				nents	y 08 (Eight) Experi	-	
CE3611: Environmental Engineering Lab							List of
Course Chemistry & Environmental Engineering Laboratory Scheme: Practical 2 Hrs/week 2	C04	ment plant.	atment plant and sewage trea	on visit to water trea	epare a report based		Experie
Course Course Cou	CO3			ine.	termination of chlor		Experi
Course Course Cou	C02			of wastewater	termination of COD		Experi
CE3611: Environmental Engineering Lab	C02			of wastewater.	termination of BOD		Experi
Covernment College of Engineering, Karad	C02			f wastewater.	termination of DO		Experi
	CO3	ıg jar test.	for turbidity removal by usir	num coagulant dose	termination of optin		Experi
					iter and wastewater.		
	CO2	xed solids of	ed, dissolved, volatile and fi	s: settable, suspend	termination of solid		Experi
	COI			ness of water.	termination of Hard		Experi
	COI		ent) of water.	rides (Chloride cont	etermination of Chlo		Experi
	C01		vastewater.	linity of water and v	etermination of Alka		Experi
	CO1		stewater.	ity of water and was	etermination of Acid		Experi
	CO1	8	ater.	f water and wastewa	etermination of pH o		Experi
	CO			Course Contents			1
	indings.	ons and report f	ctices through field observati	water treatment pra	orld water and waste	Interpret real-w	-
						processes.	-
	treatment	of water	t requirements and efficien	letermine treatmen	ry techniques to	Apply laborate	
			ics of water and wastewater.	logical characterist	al, chemical, and bio	Evaluate physic	
	asiewaler	r water and w	mases men aginifeance ii			treatment.	
Covernment College of Engineering, K Third Year (Sem – VI) B. Tech. Civil Eng CE3611: Environmental Engineering cheme: 2 Hrs/week 2 Hrs/week 1 Basic Chemistry & Environmental Science Dimes (CO): Students will be able to	ortoworton.	water and w	assess their significance in	y parameters and	mental water qualit	Analyze funda	
Covernment College of Engineering, K Third Year (Sem – VI) B. Tech. Civil Eng CE3611: Environmental Engineering Cheme: 2 Hrs/week 1 Basic Chemistry & Environmental Science				able to)): Students will be	Outcomes (Co	Course
Covernment College of Engineering, K Third Year (Sem – VI) B. Tech. Civil Engineering CE3611: Environmental Engineering cheme: 2 Hrs/week 1				nental Science	hemistry & Environ	uisite: Basic C	Prereq
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