

B.Tech Civil Engieering (Full Time)

Curriculum and Syllabus

2018 Regulation

		I SEMESTER								
S.NO.	SUBJECT	SUBJECT NAME	Ty/	L	T /	P/R	С			
	CODE		Lb/		SLr					
			ETL							
1	BEN18001	Technical English –I	Ту	1	0/0	2/0	2			
2	BMA18001	Mathematics – I	Ту	3	1/0	0/0	4			
3	BPH18001	Engineering Physics –I	Ту	2	0/1	0/0	3			
4	BCH18001	Engineering Chemistry –I	Ту	2	0/1	0/0	3			
5	BES18001	Basic Electrical & Electronics Engineering	Ту	2	0/1	0/0	3			
6	BES18002	Basic Mechanical & Civil Engineering	Ту	2	0/1	0/0	3			
	PRACTICALS*									
1	BES18L01	Basic Engineering Workshop	Lb	0	0/0	2/0	1			
2	BES18ET1	Orientation To Entrepreneurship & Project Lab	ETL	0	0/0	2/0	1			

Credits Sub Total: 20

		II SEMESTER					
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С
1	BMA18003	Mathematics – II	Ту	3	1/0	0/0	4
2	BPH18002	Engineering Physics –II	Ту	2	0/1	0/0	3
3	BCH18002	Engineering Chemistry – II	Ту	2	0/1	0/0	3
4	BES18003	Environmental Science*	Ту				NC
		PRACTICALS*					
1	BEN18ET1	Communication Lab	ETL	1	0/0	2/0	1
2	BES18ET2	Basic Engineering Graphics	ETL	1	0/0	2/0	2
3	BES18L02	Integrated Physical Science Lab	Lb	0	0/0	2/0	1
4	BES18ET3	C Programming and Lab	ETL	1	0/0	2/0	2

Credits Sub Total: 16

TOTAL CREDITS: 36

C: Credits L: Lecture T: Tutorial S.Lr: Supervised Learning P: Problem / Practical R: Research Ty/Lb/ETL: Theory /Lab/Embedded Theory and Lab * Internal Evaluation



	III SEMESTER										
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С				
1	BMA18005	Mathematics III For Mechanical and Civil	Ту	3	1/0	0/0	4				
2	BCE18001	Mechanics of Solids	Ту	3	1/0	0/0	4				
3	BCE18002	Building Materials	Ту	3	0/0	0/0	3				
4	BCE18003	Engineering Geology	Ту	3	0/0	0/0	3				
5	BEE18I04	Energy Conservation Techniques	Ту	3	0/0	0/0	3				
	PRACTICALS*										
1	BCE18L01	Building Drawing Practice	Lb	0	0/0	3/0	1				
2	BCE18L02	Strength of Materials and Concrete Lab	Lb	0	0/0	3/0	1				
3	BAR18IL1	Geology and Building Materials Lab	Lb	0	0/0	2/0	1				

Credits Sub Total: 20

		IV SEMESTER							
S.NO.	SUBJECT	SUBJECT NAME	Ty/	L	T /	P/R	С		
	CODE		Lb/		SLr				
			ETL						
1	BCE18004	Engineering Survey	Ту	3	1/0	0/0	4		
2	BCE18005	Strength of Materials	Ту	3	1/0	0/0	4		
3	BCE18006	Mechanics of Fluids	Ту	3	0/0	0/0	3		
4	BEC18I09	Sensors and Instrumentation	Ту	3	0/0	0/0	3		
5	BHS18NC1/	The Indian Constitution*/ The Indian	T	2	0/0	0/0	NC		
	BHS18NC2	Traditional Knowledge*	Ту	2	0/0	0/0	NC		
	PRACTICALS*								
1	BCE18ET1	Concrete and Construction Technology	ETL	1	0/1	3/0	3		
2	BCE18L03	Fluid Mechanics and Hydraulic Machinery Lab	Lb	0	0/0	3/0	1		
3	BCE18L04	Surveying Field Work	Lb	0	0/0	3/0	1		
4	BAR18IL2	Basics of Auto CADD	Lb	0	0/0	3/0	1		
5	BCE18TS1	Building Drawing Using Civil Engineering Software	Lb	0	0/0	0/2	1		
6	BEN18SK1	Soft Skill I (Career & Confidence Building)	ETL	0	0/0	3/0	1		

Credits Sub Total: 22

C: Credits L: Lecture T: Tutorial S.Lr: Supervised Learning P: Problem / Practical R: Research Ty/Lb/ETL: Theory /Lab/Embedded Theory and Lab * Internal Evaluation



	V SEMESTER									
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С			
1	BCE18007	Applied Hydraulic Engineering	Ту	3	1/0	0/0	4			
2	BME18I01	Composite Materials	Ту	3	0/0	0/0	3			
3	BCE18EXX	Elective I	Ту	3	0/0	0/0	3			
4	BXX180EX	Open Elective I	Ту	3	0/0	0/0	3			
		PRACTICALS*								
1	BCE18ET2	Water Supply And Sanitary Engineering	ETL	1	0/1	3/0	3			
2	BCE18L05	Environmental Engineering Lab	Lb	0	0/0	3/0	1			
3	BCE18L06	Environmental and Hydraulic Structures Drawing	Lb	0	0/0	3/0	1			
4	BCS18IL7	Basic Computer Skill For Civil Engineers	Lb	0	0/0	3/0	1			
5	BCE18TS2	Survey Camp	Lb	0	0/0	3/0	1			

Credits Sub Total: 20

	VI SEMESTER									
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С			
1	BCE18008	Structural Analysis	Ту	3	1/0	0/0	4			
2	BCE18009	Soil Mechanics And Foundation Engineering	Ту	3	1/0	0/0	4			
3	BCE18EXX	Elective II	Ту	3	0/0	0/0	3			
4	BXX180EX	Open Elective II	Ту	3	0/0	0/0	3			
PRACTICALS*										
1	BCE18ET3	Remote Sensing and GIS	ETL	1	0/1	3/0	3			
2	BCE18L07	Soil Mechanics Lab	Lb	0	0/0	3/0	1			
3	BCE18L08	Structural Analysis and Design Based On Civil Engineering Software	Lb	0	0/0	3/0	1			
4	BEN18SK2	Soft Skill II (Qualitative and Quantitative Skills)	ETL	0	0/0	3/0	1			
5	BCE18L09	Mini Project/In plant Training/Industrial training	Lb	0	0	3/0	1			
6	BCE18TS3	Advanced Surveying Field Work	Lb	0	0/0	3/0	1			

Credits Sub Total: 22

C: Credits L: Lecture T: Tutorial S. Lr : Supervised Learning P : Problem / Practical R : Research Ty/Lb/ETL: Theory/Lab/Embedded Theory and Lab *Internal evaluation



		VII SEMESTER								
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С			
1	BCE18010	Estimation And Quantity Surveying	Ту	3	1/0	0/0	4			
2	BCE18EXX	Elective III	Ту	3	0/0	0/0	3			
3	BCE18EXX	Elective IV	Ту	3	0/0	0/0	3			
4	BMG18003	Principles of Management	Ту	3	0/0	0/0	3			
	PRACTICALS*									
1	BCE18ET4	Transportation Engineering	ETL	1	0/1	3/0	3			
2	BCE18L010	Transportation Engineering Lab	Lb	0	0/0	3/0	1			
3	BCE18L011	Estimation And Evaluation Practical	Lb	0	0/0	3/0	1			
4	BCE18L012	Project Phase – I	Lb	0	0/0	3/3	2			
5	BHS18FLX	Foreign Language	Lb	0	0/0	3/0	1			
6	BXX18OLX	Open Elective Lab	Lb	0	0/0	3/0	1			
			Credi	ts Su	b Total:	: 22				
	-	III SEMESTER								
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	C			
1	BCE18011	Disaster Mitigation And Management	Ту	3	1/0	0/0	4			
2	BCE18012	Design Of Steel Structures	Ту	3	0/0	0/0	3			
3	BCE18EXX	Elective V	Ту	3	0/0	0/0	3			
		PRACTICALS*								
1	BCE18L013	Project (Phase – II)	LB	0	0/0	12/12	8			

Credits Sub Total: 18

C: Credits L: Lecture T: Tutorial S.Lr: Supervised Learning P: Problem / Practical R: Research Ty/Lb/ETL: Theory /Lab/Embedded Theory and Lab * Internal Evaluation

Credit Summary Semester: 1 :20 Semester : 2 :16 Semester : 3 :20 Semester : 4 : 22 Semester : 5 :20 Semester : 6 : 22 Semester: 7 :22 Semester: 8 :18 **Total Credits** : 160



ELECTIVE -

S.NO.	SUBJECT	SUBJECT NAME	Ty/	L	T /	P/R	С		
	CODE		Lb/		SLr				
			ETL						
1	BCE18E01	Hydrology	Ту	3	0/0	0/0	3		
2	BCE18E02	Dam Engineering	Ту	3	0/0	0/0	3		
3	BCE18E03	Industrial Structures	Ту	3	0/0	0/0	3		
4	BCE18E04	Environmental Impact Assessment	Ту	3	0/0	0/0	3		

	ELECTIVE -II										
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/	L	T/ SLr	P/R	С				
			ETL								
1	BCE18E05	Design of Concrete Structures	Ту	3	0/0	0/0	3				
2	BCE18E06	Housing Planning and Design	Ту	3	0/0	0/0	3				
3	BCE18E07	Building Technology and Habitat Engineering	Ту	3	0/0	0/0	3				
4	BCE18E08	Cost Effective Buildings	Ту	3	0/0	0/0	3				

		ELECTIVE -III					
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С
1	BCE18E09	Industrial Waste Management	Ту	3	0/0	0/0	3
2	BCE18E10	Cleaner Production	Ту	3	0/0	0/0	3
3	BCE18E11	Architecture And Town Planning	Ту	3	0/0	0/0	3
4	BCE18E12	Construction Management	Ту	3	0/0	0/0	3

	ELECTIVE -IV										
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С				
1	BCE18E13	Structural Dynamics And Earth Quake Engineering	Ту	3	0/0	0/0	3				
2	BCE18E14	Bridge Structures	Ту	3	0/0	0/0	3				
3	BCE18E15	Prestressed Concrete Structures	Ту	3	0/0	0/0	3				
4	BCE18E16	Tall Buildings	Ту	3	0/0	0/0	3				



ELECTIVE -	v
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S.NO.	SUBJECT	SUBJECT NAME	Ty/	L	T /	P/R	С
	CODE		Lb/		SLr		
			ETL				
1	BCE18E17	Repair And Rehabilitation Of Structures	Ту	3	0/0	0/0	3
2	BCE18E18	Municipal Solid Waste Management	Ту	3	0/0	0/0	3
3	BCE18E19	Finite Element Analysis	Ту	3	0/0	0/0	3
4	BCE18E20	Pre Fabricated Structures	Ту	3	0/0	0/0	3

		OPEN ELECTIVES					
		ELECTIVE -I					
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С
1	BCE18OE1	Water Pollution And Its Management	Ту	3	0/0	0/0	3
2	BCE18OE2	Environment, Health And Safety In Industries	Ту	3	0/0	0/0	3
3	BCE18OE3	Green Building And Vastu Concepts	Ту	3	0/0	0/0	3
4	BCE180E4	Climate Change And Sustainable Development	Ту	3	0/0	0/0	3
		ELECTIVE -II					
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С
1	BCE18OE5	Intelligent Transportation Systems	Ту	3	0/0	0/0	3
2	BCE18OE6	Geographical Information System And Mapping	Ту	3	0/0	0/0	3
3	BCE18OE7	Industrial Pollution Prevention And Cleaner Production	Ту	3	0/0	0/0	3
4	BCE18OE8	Air Pollution Control	Ту	3	0/0	0/0	3

		OPEN LAB					
S.NO.	SUBJECT CODE	SUBJECT NAME	Ty/ Lb/ ETL	L	T/ SLr	P/R	С
1	BCE18OL1	Building Drawing Practice Using Auto Cadd	Lb	0	0/0	3/0	1
2	BCE18OL2	Geographical Information System And Mapping Lab	Lb	0	0/0	3/0	1
3	BCE18OL3	Environmental Engineering Lab	Lb	0	0/0	3/0	1



I SEMESTER



DEPARTMENT OF ENGLISH

Subje		de :	Subject	Name : 7			IENT (ENGL		[L	T/SLr	P/R	С
BEN1				isite : No						1	0/0	2/0	2
			Г : Tutorial heory / Lal					: Projec	t R : Re	search	C: Credit	S	
	0B. •	JECTIV Strengt	ES : hen their v	ocabular	y in bot	h techn	ical and	l busine	ess situat	ions			
	•	Get pra	ctice in fur	nctional g	gramma	r							
	•	Learn t	he effective	e way of	corresp	onding	with of	ficials					
	•	Learn t	o give instr	ructions, s	suggest	ions, re	comme	ndatior	s and co	mprehe	end and inf	fer the infor	mation from
		the give	en passages	8.									
	•		earners in c	-			profess	sional v	vriting				
			UTCOMI npleting th	. ,		,	to						
CO1		St	rengthen th	neir activ	e and te	echnical	lvocabi	ulary					
CO2		U	nderstand f	unctiona	l gramr	nar and	gain pi	oficier	cy in tec	hnical	writing		
CO3		L	earn the ap	propriate	technie	que of v	writing	formal	and busi	ness le	tters; inter	pret the adv	vertisement
		ar	d prepare t	the resum	ne relev	antly							
CO4			-				ns, reco	ommeno	lations a	nd com	prehend a	nd infer the	information
~~~			om the give										
CO5	Mar		cus on aca				-	omes (]					
COs/I	-	PO1	PO2	PO3	PO4	PO5	PO6	PO7	<b>PO8</b>	PO	PO10	PO11	PO12
CO1					H					9	Н		Н
CO2					Н						Н		Н
CO3					H		Μ			Η	Н		Н
CO4					H					H	H		H
CO5	H/N	1/L indi	cates stren	oth of co	H prrelati	on H	– High	M – N	/ledium	H L – L	H		H
~								,				¢	
Category		Basic Sciences	Engg Sciences	Humaniti es &	Social Sciences Program	core	Program Electives		Upen Electives	Practical / Proiect		Internship s / Toobaiool	Soft Skills
-				√									



**TECHNICAL ENGLISH - I** 

### UNIT I **VOCABULARY BUILDING**

The concept of Word Formation-Root words and affixes from foreign languages and their use in English to form derivatives.-Homophones- Words often confused-Verbal analogy

### UNIT II BASIC WRITING SKILLS

Using Idioms and phrases in sentences-Sentence structures: statements, interrogative and imperative-Use of Conditional/if' clauses in sentences-Importance of proper punctuation-Creating coherence with sentence markers-Organizing coherent paragraphs in essays

### UNIT III **IDENTIFYING COMMON ERRORS IN WRITING**

Subject-verb agreement-Noun-pronoun agreement- Misplaced modifiers-Articles-Prepositions- Redundancies and Clichés

### **UNIT IV** WRITING PRACTICE- NATURE AND STYLE OF TECHNICAL WRITING **6HRS**

Describing Gadgets- Defining Concepts-Classifying data-Comprehension-Essay Writing-Informal and Formal Letter Writing:

### UNIT V ORAL COMMUNICATION AND INTERACTIVE LEARNING

(This unit involves interactive practice sessions in Language Lab)

Activities to develop knowledge in Word formation, Vocabulary and analytical thinking-Instructions and -Recommendations-Formal and Informal Registers in Speech-Listening and taking notes 

# Total no. of periods : 30

# **TEXT BOOK :**

**BEN18001** 

1. Quest : A Textbook of Communication Skills, Vijay Nicole, 2017. Pushkala, R, Padmasani Kannan S, Anuradha V, Chandrasena M Rajeswaran

# SUGGESTED READINGS:

- 1. Practical English Usage. Michael Swan. OUP. 1995.
- 2. Remedial English Grammar. F.T. Wood. Macmillan.2007
- 3. On Writing Well. William Zinsser. Harper Resource Book. 2001
- 4. Study Writing, Liz Hamp-Lyons and Ben Heasly, Cambridge University Press. 2006.
- 5. Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
- 6. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press
- 7. Pronunciation in Use ,Mark Hancock. Cambridge University Press. 2012

**6HRS** 

6HRS

2

2/0

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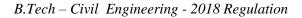
6 HRS

6HRS



# **Department of Civil Engineering** DEPARTMENT OF MATHEMATICS

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	ect Co [A180		-		MATHI		_5-1				T/SL	r	P/R	C
	mio		Prerequ	isite : No	one				3		1/0		0/0	4
	L:	Lecture	T : Tutor	ial SLr	: Superv	ised Lea	rning P :	Projec	t R:R	esea	rch C: Cro	edits		
			Theory / I				U	J						
	OB	JECTI	VES											
			ply the Ba	asic con	cepts in A	Algebra								
			e the Bas		-	-								
			ntify and	-		-	-							
			derstand t		-									
		• Ap	pply the B	asic con	icepts in	Function	ns of Sev	eral va	riables					
			OUTCO											
<u>CO1</u>	Su	uents co	mpleting				aonica -	f hir are			atio1 0-1	o mi 41.		
CO1						Ŷ					ntial & log			
CO2					- a	agonal	matrix 1	nto an	equiv	alent	diagonal	mat	rix using	ortnogonal
			transfor	mation.										
CO3			Find ex	pansion	of trigon	ometric	function	into an	infinite	e seri	les and to s	separa	te a comple	x function
			into rea	l and im	aginary p	parts.								
CO4			Apply k	nowled	ge and co	oncepts i	n finding	g the de	rivative	e of g	given func	tion a	nd to find th	ne maxima
					given fu	_					-			
CO5					-		entiation	and ma	xima /	mini	ma of a fu	Inctio	n of several	variables
	Mo	nning	of Course											
COs/P		PO1	PO2	PO3	PO4	PO5	PO6	PO7	-	Р	PO10	Р		PO12
COS/F	US	FUI	F02	103	r04	105	FUO	10/	8	Г О	FUIU	I O		F012
									Ŭ	9		1		
												1		
CO1		H	H			Μ	M			Η	H			H
CO2		H	H			H	L							H
CO3		H	H			M				Μ	H			L
CO4		Η	H			L				Μ	H			M
CO5		H	Η				Μ			Μ	Μ			H
	<b>H</b> /I	M/L ind	icates str	ength o	f correla	ntion H	– High,	M - M	ledium	<b>,</b> L	– Low			
ry		S	s	iti	S	я	es n		es	al /		ir	cal	
Category		ic ence	ig Snce	Humaniti	k ial ence	graı S	Program Electives	ц	ctiv	ctic		lsm	hnid Ils	t IIs
Cat		Basic Sciences	Engg Sciences	Hur	es & Social Sciences	Program core	Program Electives	Open	Electives	Practical		Internshin	s / Technical Skills	Soft Skills
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**MATHEMATICS – I** 

### UNIT I **ALGEBRA**

**BMA18001** 

Binomial, Exponential, Logarithmic Series (without proof of theorems) - Problems on Summation, Approximation and Coefficients.

### UNIT II MATRICES

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Cayley -Hamilton theorem(without proof) – Orthogonal reduction of a symmetric matrix to Diagonal form.

### UNIT III TRIGONOMETRY

Expansions of Sin  $n\theta$ , Cos  $n\theta$  in powers of Sin $\theta$  and Cos $\theta$  – Expansion of Tan  $n\theta$  – Expansions of Sin $^{n}\theta$  and Cos $^{n}\theta$ in terms of Sines and Cosines of multiples of  $\theta$  – Hyperbolic functions – Separation into real and imaginary parts.

### **UNIT IV** DIFFERENTIATION

Basic concepts of Differentiation - Elementary differentiation methods - Parametric functions - Implicit function -Leibnitz theorem(without proof) - Maxima and Minima - Points of inflection.

### UNIT V FUNCTIONS OF SEVERAL VARIABLES

Partial derivatives – Total differential – Differentiation of implicit functions – Taylor's expansion – Maxima and Minima by Lagrange's Method of undetermined multipliers – Jacobians.

Total no. of periods : 60

# **TEXT BOOKS**

- 1. Kreyszig E., Advanced Engineering Mathematics (10th ed.), John Wiley & Sons, (2011).
- 2. Veerarajan T., Engineering Mathematics (for first year), Tata McGraw Hill Publishing Co., (2008).

# REFERENCES

- 1. Grewal B.S., Higher Engineering Mathematics, Khanna Publishers, (2012).
- 2. John Bird, Basic Engineering Mathematics (5th ed.), Elsevier Ltd, (2010).
- 3. P.Kandasamy, K.Thilagavathy and K. Gunavathy, Engineering Mathematics Vol. I (4th Revised ed.). S.Chand& Co., Publishers, New Delhi (2000).
- 4. John Bird, Higher Engineering Mathematics (5th ed.), Elsevier Ltd, (2006).





**12HRS** 

12HRS

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# **12HRS**

12HRS

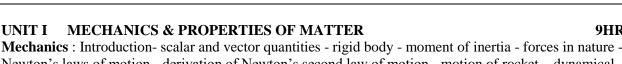
# **12HRS**

3 1/0



# Department of Civil Engineering DEPARTMENT OF PHYSICS

Subject Coc BPH18001	le :	Su	ıbject Na	ime : EN	GINEE	RING PI	HYSICS	- I	L	T/SLr	P/F	2	C
		Pr	erequisit	e : None	;				2	0/1	0/0	)	3
			` : Tutoria neory / La				U	oject R	: Resea	cch C: Cre	dits	<b>I</b>	
	OBJE • Ou			on betwe	en Scien	ce, Engin	eering &	Techno	logy.				
	• De	emonst	rate com	petency	in unders	standing	basic con	cepts.					
	• Ap	oply fu	ndamenta	al laws c	of Physic	s in Engi	neering &	Techno	ology.				
	• To	identi	fy & solv	ve proble	ems using	g physics	concepts						
	• Pro	oduce	and prese	ent activ	ities asso	ciated wi	th the cou	arse thro	ugh effe	ective tech	nical c	ommunic	ation
			UTCOM pleting the		· ·	· ·							
CO1			Demons	trate cor	npetency	in under	standing l	basic co	ncepts.				
CO2			Utilize	scientifi	c metho	ds for t	formal in	vestigat	ions &	demonst	rate c	ompetenc	y with
			experime	ental me	thods an	d verify t	he concep	ot to con	tent kno	wledge.			
CO3			Identify	and prov	vide solu	tions for	engineeri	ng probl	ems.				
CO4			Relate th	ne techni	ical conce	epts to da	y to day l	ife and	to practi	cal situation	ons.		
CO5			Think ar	nalytical	ly to inte	rpret con	cepts.						
	Mappi	ing of	Course (	Outcom	es with <b>H</b>	Program	Outcome	es (POs)					
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO11	PO 12
CO1	H	Н		M	Μ	М							
CO2	Н	Н	М	M	М	М			M	Μ			
CO3	H	Н	H	Μ	Μ	Μ				Μ			Μ
CO4	H	H	M	M		M			M	Μ			Μ
CO5	H	H	M	41 6		M	TT. 1 . N.	M					L
	H/M/I	1 indic	ates stre	ength of	correlat	10n H –	High, M	– Medi	um, L				
				-	s c	я		'es	t t	hip	cal		
Category	Basic Sciences	Engg	Sciences	es & Social	Sciences Program core	Program Flectives	Open	Electives	Practical Project	Internship s /	Technical Skills		Soft



**ENGINEERING PHYSICS - I** 

Newton's laws of motion - derivation of Newton's second law of motion - motion of rocket – dynamical concepts - kinematics - conservation of energy and momentum - conservative and non-conservative forces mechanics of continuous media - friction and its applications.

Properties of Matter: Elasticity - stress, strain and Hook's law - Poisson's ratio - three moduli of elasticity - twisting couple on a wire - viscosity - flow of liquid through a narrow tube: Poiseuille's law - Ostwald's viscometer - flow of blood in human body.

# UNIT IISHM AND ACOUSTICS

**SHM**: Simple harmonic motion - differential equation of SHM - graphical representation of SHM - average kinetic energy of vibration - total energy of vibration - free and forced vibrations - damped and undamped vibrations - resonance - transverse wave on a string - law of transverse vibration of string - verification of the laws of transverse vibration of string - standing waves.

Acoustics : Fundamentals of acoustics - reverberation- reverberation time - factors affecting acoustics Ultrasonics - Production of ultrasonic waves - detection of ultrasonic waves - acoustic grating application of ultrasonic waves.

# UNIT III WAVE OPTICS

Huygen's principle - interference of light - wavefront splitting and amplitude - airwedge - Newton's rings - Michelson interferometer and its applications - Fraunhofer diffraction from a single slit - Rayleigh criterion for limit of resolution - diffraction grating and resolving power of a telescope.

# UNIT IV ELECTROMAGNETIC THEORY

Electric field - coulomb's law - alternating emf - rms and average value of an alternating current & voltage - resistors, capacitors and inductor - energy stored in a capacitor - LCR circuit & resonance - magnetismdefinition - types - Biot Savart law - energy stored in a magnetic field - Domain theory - electromagnetic induction - self and mutual inductance - Faraday's law of electromagnetic induction -Lenz law.

# UNIT V LASER

Laser principle and characteristics - amplification of light by population inversion - properties of laser beams: mono-chromaticity, coherence, directionality and brightness - different types of lasers - Ruby laser-Nd-YAG laser-He-Ne laser-CO₂ laser - semiconductor laser - applications of lasers in science, engineering and medicine.

# **Total No of Periods : 45**

# TEXT BOOKS

- 1. Brijlal, M. N. Avadhanulu & N. Subrahmanyam, Text Book of Optics, S. Chand Publications, 25th edition. 2012
- 2. R. Murugeshan, Electricity and Magnetism, S. Chand Publications, 10th edition, 2017
- 3. R. Murugeshan & Kiruthiga Sivaprasath, Modern Physics, S. Chand Publications, 2016

# **REFERENCE BOOKS**

- 1. Dr. Senthil Kumar Engineering Physics I VRB Publishers, 2016
- 2. N Subrahmanyam & Brijlal, Waves and Oscillations, Vikas Publications, New Delhi, 1988
- 3. N Subrahmanyam & Brijlal, Properties of Matter, S. Chand Co., New Delhi, 1982
- 4. N Subrahmanyam & Brijlal, Text book of Optics, S. Chand Co., New Delhi, 1989
- 5. R. Murugeshan, Electricity and Magnetism, S. Chand & Co., New Delhi, 1995
- 6. Thygarajan K & Ajay Ghatak, Laser Theory and Applications, Macmillan, New Delhi, 1981

# **BPH18001**

UNIT I

9HR

9HR

9HRS

# 9HR

# 9HRS

0/0.

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# 3



# Department of Civil Engineering DEPARTMENT OF CHEMISTRY

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ENGINEERING CHEMISTRY - I

### CHEMICAL THERMODYNAMICS UNIT I

BCH18001

Introduction, Terminology in thermodynamics -System, Surrounding, State and Path functions, Extensive and intensive properties. Laws of thermodynamics - I and II laws-Need for the II law. Enthalpy, Entropy, Gibbs free energy, Helmholtz free energy - Spontaneity and its criteria. Maxwell relations, Gibbs -Helmholtz equation (relating E & A) and (relating H & G), Van't Hoff equations.

### UNIT II **TECHNOLOGY OF WATER**

Water quality parameters – Definition and expression. Analysis of water – alkalinity, hardness and its determination (EDTA method only). Boiler feed water and Boiler troubles-Scales and sludges, Caustic embrittlement, Priming and Foaming and Boiler corrosion. Water softening processes - Internal and external conditioning – Lime soda, Zeolite, Demineralisation methods. Desalination processes-RO and Electrodialysis .Domestic water treatment.

### ELECTROCHEMISTRY AND ENERGY STORAGE DEVICES UNIT III 10HRS

Conductance - Types of conductance and its Measurement. Electrochemical cells - Electrodes and electrode potential, Nernst equation – EMF measurement and its applications. Types of electrodes- Reference electrodes-

Standard hydrogen electrode- Saturated calomel electrode-Quinhydrone electrode – Determination of P^H using these electrodes.

Reversible and irreversible cells– Fuel cells- H₂–O₂ fuel cell, Batteries-Lead storage battery,Nickel– Cadmium and Lithium-Battery.

### CORROSION AND PROTECTIVE COATING **UNIT IV**

Introduction-Causes of Corrosion-Consequences- Factors affecting corrosion. Theories of corrosion-Chemical corrosion and Electrochemical corrosion. Methods of corrosion control – corrosion inhibitors, Sacrificial anode and Impressed current cathodic protection.

Protective coatings- Metallic coatings- Chemical conversion coatings-paints-Constituents and functions.

### POLYMERS AND COMPOSITES UNIT V

Monomers - Functionality - Degree of polymerization-Tacticity.Polymers - Classification, Conducting Polymers, Biodegradable polymers- Properties and applications. Plastics – Thermoplastics and thermosetting plastics, Compounding of plastics - Compression moulding, injection moulding and extrusion processes.

Polymer composites-introduction-Types of composites-particle reinforced-fiber reinforced-structural compositesexamples. Matrix materials, reinforcement materials-Kevlar, Polyamides, fiber glass, carbon fibers, ceramics and metals.

# **TEXTBOOKS**

- 1. S.Nanjundan & C.SreekuttanUnnithan, "Applied Chemistry", Sreelakshmi Publications, (2007)
- 2. Dr.R.Sivakumar and Dr.N.Sivakumar" Engineering Chemistry" Tata McGraw Hill Publishing Company Ltd, Reprint 2013.

# REFERENCES

- 1. P.C. Jain & Monika Jain, "Engineering Chemistry", Dhanpat Rai publishing Co., (Ltd.) (2013).
- 2. J. C. Kuriacose & J. Rajaram, "Chemistry in Engineering & Technology", Tata Mc Graw Hill (1996).
- 3. B.R.Puri, L.R.Sharma & M.S.Pathania, "Principles of Physical Chemistry", Vishal publishing co., (2013)

# 8HRS

9HRS

# 9HRS

Total number of periods : 45

# 9HRS

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2



Subject	Subject	t Name : ]	PASIC					5	L	T/SL		P/R	С	
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CO2	Predict	the beha	vior of d	ifferent	electric a	and magn	etic Circ	cuits.						
CO3	Identify	y conven	tional ar	nd Non-o	conventio	onal Elec	trical po	wer G	eneratio	on, Trans	missi	ion and Di	stribution.	
CO4	Identify	y & Appl	y schema	atic sym	bols and	understa	nd the w	orking	g princi	ples of e	lectro	onic device	es	
CO5	Analyz	e basics o	of digital	electro	nics and	solving p	roblems	and c	lesign c	ombinat	ional	circuits		
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# **Department of Civil Engineering** DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

# BES18001 BASIC ELECTRICAL & ELECTRONICS ENGINEERING 2 0/1 0/0 3

# UNIT I ELECTRIC CIRCUITS

Electrical Quantities – Ohms Law – Kirchhoff's Law – Series and Parallel Connections – Current Division and Voltage Division Rule - Source Transformation – Wye (Y) – Delta  $(\Delta)$  , Delta  $(\Delta)$  – Wye (Y) Transformation – Rectangular to Polar and Polar to Rectangular.

# UNIT II MACHINES & MEASURING INSTRUMENTS

Construction & Principle of Operation of DC motor & DC Generator – EMF equation of Generator – Torque Equation of Motor – Construction & Principle of operation of a Transformer – PMMC – Moving Iron types of meter – Single Phase Induction Type Energy Meter.

# UNIT III BASICS OF POWER SYSTEM

Generation of Electric Power (Thermal, Hydro, Wind and Solar) – Transmission & Distribution of Electric Power – Types of Transmission & Distribution Schemes – Representation of Substation.

# UNIT IV ELECTRON DEVICES

Passive Circuit Components-Classification of Semiconductor-PN Junction Diode-Zener diode- Construction and Working Principle –Applications--BJT-Types of configuration-JFET.

# UNIT V DIGITAL SYSTEM

Number System – Binary, Decimal, Octal, Hexadecimal – Binary Addition Subtraction, Multiplication & Division–Boolean Algebra – Reduction of Boolean Expressions – Logic Gates - De-Morgan's Theorem , Adder – Subractor.

# **Total no of Periods : 45**

# **TEXT BOOKS**

- 1. D P Kothari, I J Nagrath, Basic Electrical Engineering, Second Edition, , Tata McGraw-Hill Publisher
- 2. A Course In Electrical And Electronic Measurements And Instrumentation, A.K. Sawhney, publisher DHANPAT RAI&CO
- 3. Text Book of Electrical Technology: Volume 3: Transmission, Distribution and Utilization, B.L. Theraja, A.K. Theraja, publisher S. CHAND
- 4. Morris Mano, M. (2002) Digital Logic and Computer Design. Prentice Hall of India
- 5. Millman and Halkias1991, Electronic Devices and Circuits, Tata McGraw Hill,

# REFERENCES

1. R.Muthusubramanian, S.Salivahanan, K A Muraleedharan, Basic Electrical, Electronics And Computer Engineering, Second Edition, ,Tata McGraw-Hill publisher.

# 9HRS

9HRS

9HRS

### 9HRS

### 9HRS



# DEPARMENT OF MECHANICAL ENGINEERING

Subject BES180			•			IECHAN EERING		έ¢	L	T/SLr	P/R	C
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B.Tech – Civil Engineering - 2018 Regulation



# BES18002 BASIC MECHANICAL & CIVIL ENGINEERING 2 0/1 0/0 3

# UNIT I THERMAL ENGINEERING

Classification of internal combustion engine – two stroke, four stroke petrol and diesel engines. Classification of Boilers – Cochran boiler – Locomotive boilers – Power plant classification – Working of Thermal and Nuclear power plant.

# **UNIT II MANUFACTURING PROCESS**

Metal forming processes – Rolling, forging, drawing, extrusion and sheet metal operations- fundamentals only. Metal Joining processes – Welding - arc and gas welding, Soldering and Brazing. Casting process – Patterns -Moulding tools - Types of moulding - Preparation of green sand mould -Operation of Cupola furnace.

Basics of metal cutting operations – Working of lathe- parts-Operations performed. Drilling machine – Classification – Radial drilling machine - Twist drill nomenclature.

### UNIT III MECHANICS

Stresses and Strains – Definition – Relationship – Elastic modulus – Centre of gravity – Moment of Inertia – Problems. (Simple Problems Only).

UNIT IV BUILDING MATERIALS AND CONSTRUCTION

<u>Materials</u>:Brick - Types of Bricks - Test on bricks - Cement – Types, Properties and uses of cement – Steel - Properties and its uses – Ply wood and Plastics.

<u>Construction</u>:Mortar – Ingredients – Uses – Plastering - Types of mortar - Preparation – Uses – Concrete – Types – Grades – Uses – Curing – Introduction to Building Components (foundation to roof) – Masonry – Types of masonry (Bricks & Stones)

# UNIT V ROADS, RAILWAYS, BRIDGES & DAMS

Roads – Classification of roads – Components in roads – Railways -Components of permanent way and their function – Bridges – Components of bridges – Dams – Purpose of dams – Types of dams.

### **Total No. of Periods : 45**

# **TEXT BOOKS**

- 1. S. Bhaskar, S. Sellappan, H.N.Sreekanth, (2002), "Basic Engineering" –Hi-Tech Publications
- 2. K. Venugopal, V. Prabhu Raja, (2013-14), "Basic Mechanical Engineering", Anuradha Publications.
- 3. K.V. Natarajan (2000), Basic Civil Engineering, Dhanalakshmi Publishers
- 4. S.C. Sharma(2002), Basic Civil Engineering, Dhanpat Raj Publications

### REFERENCES

- 1. PR.SL. Somasundaram, (2002), "Basic Mechanical Engineering" –, Vikas Publications.
- 2. S.C. Rangawala(2002), Building Material and Construction, S. Chand Publisher

### 9HRS

13HRS

9HRS

7HRS

### 7HRS



# **Department of Civil Engineering DEPARTMENT OF ENGINEERING SCIENCES**

Subject Code	: BES18L	01 Subje	ct Name	e :BASI	C ENG	INEEF	RING	L	T/SLr	P/R		С
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Category	Basic Sciences	Engg Sciences	Humaniti es &	Program core		Program Electives		Open Electives	Practical / Project	Internship s /	soft Skills	
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**BES18L01** 

# **BASIC ENGINEERING WORKSHOP**

0 0/0 2/01

# MEP PRACTICE

# 1. FITTING:

Study of fitting tools and Equipments – Practicing, filing, chipping and cutting – making V-joints, half round joint, square cutting and dovetail joints.

# 2. CARPENTRY:

Introduction – Types of wood – Tools – Carpentry processes – Joints – Planning practice – Tee Halving Joint - Cross Lap Joint - Maritse and Tenon Joint - Dovetail Joint

# **3. SHEET METAL:**

Study of tools and equipments – Fabrication of tray, cones and funnels.

# **CIVIL ENGINEERING PRACTICE**

- 1. Study of Surveying and its equipments
- Preparation of plumbing line sketches for water supply and sewage lines 2.
- 3. Basic pipe connection using valves, laps, couplings, unions, reduces and elbows in house hold fittings

# **ELECTRICAL ENGINEERING PRACTICE**

- Measurement of electrical quantities voltage, current, power & power factor in RLC circuit. 1.
- Measurement of energy using single phase energy meter. 2.
- Measurement of resistance to earth of an electrical equipment. 3.
- 4. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
- Fluorescent lamp wiring. 5.
- 6. Stair case wiring

# **ELECTRONIC ENGINEERING PRACTICE**

- 1. Study of Electronic components and equipments Resistor, colour coding measurement of AC signal parameter (peak- peak, rms period, frequency) using CRO
- 2. Soldering practice Components Devices and Circuits Using general purpose P



Abdul Kalam CoE for Innovation & Entrepreneurship

Subject (		Subject				ovation & ON TO			L	T/SL		C
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	Studer	its comple	eting the	e course	were ab.	le to						
CO1		Deve	elop a B	usiness	plan & i	mprove a	bility to	recogniz	e busines	s opportu	nity	
CO2		Do a	self ana	alysis to	build a e	entrepren	eurial ca	reer.				
CO3		Artic	culate an	effectiv	ve elevat	or pitch.						
CO4		Anal	yze the	local ma	rket env	vironment	& demo	onstrate t	he ability	to find a	n attractiv	e
		mark	tet									
C05		Ident	tify the	required	skills fo	or entrepre	eneurshi	p & deve	lop			
	Mann	ing of Co	Jurso Oi	itcomes	with P	rogram (	Jutcom	r ne (POe)	•			
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Os												12
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CO2	H	Μ		H	Μ	H	Μ	H	H	H	M	Μ
CO3		Μ	Μ	Μ		H		Н	H	H		
CO4		Н	Μ	Μ	Μ	Μ		H	M	Μ	H	
CO5		M	M	H	M	M	H	H	M	M	H	L
	H/M/I	indicate	es streng	gth of co	orrelatio	n H - H	nigh, M	– Mediu	$\mathbf{m}, \mathbf{L} - \mathbf{L}$	LOW		
ory	čes	ses	niti	Se	ш	um ves		ves	.	ship ical		
Category	Basic Sciences	Engg Sciences	Humaniti	es & Social Sciences	Program core	Program Electives	Open	Electives	Project	Internship s / Technical	emp	Soft
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# BES18ET1 ORIENTATION TO ENTREPRENEURSHIP & PROJECT LAB 0 0/0 2/0 1 (ETL)

# UNIT I CHARACTERISTICS OF A SUCCESSFUL ENTREPRENEUR

Introduction to entrepreneurship education – Myths about entrepreneurship – How has entrepreneurship changed the country – Dream it. Do it - Idea planes - Some success stories – Global Legends – Identify your own heroes

# UNITII ENTREPRENEURIAL STYLE

Entrepreneurial styles – Introduction, concept & Different types - Barrier to Communication – Body language speaks louder than words

# UNIT III DESIGN THINKING

Introduction to Design thinking – Myth busters – Design thinking Process - Customer profiling – Wowing your customer – Personal selling – concept & process – show & tell concept – Introduction to the concept of Elevator Pitch

# UNIT IV RISK MANAGEMENT

Introduction to risk taking & Resilience – Managing risks (Learning from failures, Myth Buster) – Understanding risks through risk takers – Why do I do? – what do I do ?

# UNIT V PROJECT

How to choose a topic – basic skill sets necessary to take up a project – creating a prototype – Pitch your project – Project presentation.

# **REFERENCE BOOKS & WEBSITE**

- 1. Encyclopedia of Small Business (2011) (e book)
- 2. Oxford Handbook of Entrepreneurship (2014) –(e book)
- 3. lms.learnwise.org



# **II SEMESTER**



# DEPARTMENT OF MATHEMATICS

Subj	ject (	Code :	Subjec	t Name :	MAT	HEMA	TICS	- II		L	T/SLr	]	P/R	С	
BN	AA1	8003	Prereq	uisite : N	lone					3	1/0	(	0/0	4	
			: Tutoria						ct R : R	lesearch	n C: Cre	dits			
	OB.	IECTIV	ES :												
		• Unde	erstand th	e Basic c	concept	ts in Int	egratio	n							
		• Iden	tify the B	asic conc	epts in	Multip	ole integ	grals							
		• Use the Basic concepts in Ordinary Differential equations													
		<ul> <li>Apply the Basic concepts of Analytical Geometry</li> </ul>													
		<ul> <li>Apply the Basic concepts of Analytical Geometry</li> <li>Analyze the Basic concepts of Vector Calculus</li> </ul>													
	CO														
		COURSE OUTCOMES (Cos) : (3 – 5) Students completing the course were able to													
CO1		Integrate given function by using methods of integration and to find the area under curve and the volume of a solid by revaluation													
CO2		of a solid by revaluation.         Evaluate the multiple integrals / area /volume and to change the order of integration.													
CO3	S	Solve the ordinary differential equation and to solve Eulers differential equation.													
CO4	F	ind the e	quation o	of planes,	lines a	ind sph	ere and	to find	the short	est dist	ance bet	ween	to skew li	nes.	
CO5	F	ind the g	radient, r	naximun	n direct	ional d	erivativ	e and w	ork don	e by a f	orce and	to ver	rify Greer	n/	
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COs/P	Os	PO1	PO2	PO3	PO 4	PO 5	PO 6	PO7	PO8	PO 9	PO1 0	PO1 1		PO1 2	
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Category	Basic Sciences Engg Sciences Sciences Sciences Program core Program Electives Project Project Internship s/ Technical Skills										ls				
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# **MATHEMATICS – II**

**Department of Civil Engineering** 

### UNIT I **INTEGRATION**

**BMA18003** 

Basic concepts of Integration – Methods of Integration – Integration by substitution – Integration by parts – Definite integrals – Properties of definite integrals – Problems on finding Area and Volume using single integrals (simple problems).

### UNIT II **MULTIPLE INTEGRALS**

Double integral in Cartesian and Polar Co-ordinates - Change of order of integration - Triple integral in Cartesian Co-ordinates – Spherical Polar Co-ordinates – Change of variables (simple problems).

### UNIT III **ORDINARY DIFFERENTIAL EQUATIONS**

First order differential equations – Second and higher order linear differential equations with constant coefficients and with RHS of the form:  $e^{ax}$ ,  $x^n$ , Sin ax, Cos ax,  $e^{ax}f(x)$ , x f(x) where f(x) is Sin bx or Cos bx – Differential equations with variable coefficients (Euler's form) (simple problems).

### **UNIT IV** THREE DIMENSIONAL ANALYTICAL GEOMETRY

Direction Cosines and Ratios – Equation of a straight line – Angle between two lines – Equation of a plane – Coplanar lines – Shortest distance between skew lines – Sphere – Tangent plane.

### UNIT V **VECTOR CALCULUS**

Scalar and Vector functions – Differentiation – Gradient, Divergence and Curl – Directional derivatives – Irrotational and Solenoidal fields-Line, Surface and Volume integrals - Green's, Stoke's and Gauss divergence theorems (statement only) – Verification.

# Total no.of periods: 60

# **TEXTBOOKS**

- 1. Kreyszig E., Advanced Engineering Mathematics (10th ed.), John Wiley & Sons, (2011).
- 2. Veerarajan T., Engineering Mathematics (for first year), Tata McGraw Hill Publishing Co., (2008).

# REFERENCES

- 1. Grewal B.S., Higher Engineering Mathematics, Khanna Publishers, (2012).
- 2. John Bird, Basic Engineering Mathematics (5th ed.), Elsevier Ltd, (2010).
- 3. P.Kandasamy, K.Thilagavathy and K. Gunavathy, Engineering Mathematics Vol. I (4th Revised e) S.Chand& Co., Publishers, New Delhi (2000).
- 3. John Bird, Higher Engineering Mathematics (5th ed.), Elsevier Ltd, (2006).

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# 3 1/0 0/0 4

# **12HRS**

12HRS

# 12HRS

# 12HRS

# **12HRS**





# Department of Civil Engineering DEPARTMENT OF PHYSICS

		Subject N	ame : E	NGINI	EERIN	G PHY	SICS -	- II	L	Τ/	SLr	P/R	С	
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Stu	aents	completing	the coul	rse wer	e able	to								
		Demonstrate	e skills n	ecessar	y for co	onducti	ng resear	ch relate	ed to con	ntent kno	wledge	and labo	ratory	
		skills.												
		Apply knowledge and concepts in advanced materials and devices.												
		Acquired Analytical, Mathematical skills for solving engineering problems.												
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	Basic Sciences	Engg Sciences	Humaniti ss & locial rogram ore			Program Electives	rogram Electives Dpen		Practical / Project	nternship / cechnical kills		10 C	Skills	
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	8002 L:I T/L/ OB. CO Stud ing c POs H/N	T/L/ETL OBJECT 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D	8002       Prerequis         L : Lecture T : Tutoria         T/L/ETL : Theory / La         OBJECTIVES :         • Design, condu         • Develop a Sci         • Understand th         • Apply the scie         COURSE OUTCOM         Students completing         OB         Acquired Ai         Skills.         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Apply knowledge and concepts in advance         Acquired Analytical, Mathematical skills         Ability to design and conduct experiments         Generate analytical thought to interpret refing of Course Outcomes with Program Outcomes         PO       PO         PI       M         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H	8002       Prerequisite : None         L : Lecture T : Tutorial SLr : Supervised Learning P : Projet T/L/ETL : Theory / Lab / Embedded Theory and Lab         OBJECTIVES :         • Design, conduct experiment and analyze data.         • Develop a Scientific attitude at micro and nano scal         • Understand the concepts of Modern Physics         • Apply the science of materials to Engineering & Te         COURSE OUTCOMES (Cos) : (3 – 5)         Students completing the course were able to         Demonstrate skills necessary for conducting reseat skills.         Apply knowledge and concepts in advanced mate         Acquired Analytical, Mathematical skills for solv         Ability to design and conduct experiments as well         Generate analytical thought to interpret results &         ing of Course Outcomes with Program Outcomes (POs)         PO       PO         PO       PO         PO       PO         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H	8002       Prerequisite : None         L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : F         T/L/ETL : Theory / Lab / Embedded Theory and Lab         OBJECTIVES :         • Design, conduct experiment and analyze data.         • Develop a Scientific attitude at micro and nano scale of mate         • Understand the concepts of Modern Physics         • Apply the science of materials to Engineering & Technolog         COURSE OUTCOMES (Cos) : (3 – 5)         Students completing the course were able to         Demonstrate skills necessary for conducting research relate skills.         Apply knowledge and concepts in advanced materials and         Acquired Analytical, Mathematical skills for solving engi         Ability to design and conduct experiments as well as func         Generate analytical thought to interpret results & place the         ing of Course Outcomes with Program Outcomes (POs)         POS       PO       PO       PO       PO       PO         Yes       PO       PO       PO       PO       PO       PO       PO         H       H       M       M       L       L       L       L       L       L         Image: COURSE OUTCOMES (Cos) : (3 – 5)       Students conving engi       Acquired Analytical, Mathematical skills for solving engi	8002       Prerequisite : None       2         L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research T/L/ETL : Theory / Lab / Embedded Theory and Lab       Course counce of the course of the	8002       Prerequisite : None       2       0         L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Creater T/L/ETL : Theory / Lab / Embedded Theory and Lab       0         OBJECTIVES :       •       Design, conduct experiment and analyze data.       •         •       Develop a Scientific attitude at micro and nano scale of materials       •       Understand the concepts of Modern Physics         •       Apply the science of materials to Engineering & Technology       COURSE OUTCOMES (Cos) : (3 – 5)       Students completing the course were able to         VIDENTIFY COURSE (Cos) : (3 – 5)       Students completing the course were able to       Demonstrate skills necessary for conducting research related to content kno skills.         Apply knowledge and concepts in advanced materials and devices.       Acquired Analytical, Mathematical skills for solving engineering problems         Ability to design and conduct experiments as well as function in a multi di Generate analytical thought to interpret results & place them within a broating of Course Outcomes with Program Outcomes (POS)         YOS       PO       PO <td< td=""><td>8002       Prerequisite : None       2       0/1         L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab       OBJECTIVES :         • Design, conduct experiment and analyze data.       • Develop a Scientific attitude at micro and nano scale of materials         • Understand the concepts of Modern Physics       • Apply the science of materials to Engineering &amp; Technology         COURSE OUTCOMES (Cos) : (3 – 5)       Students completing the course were able to         Demonstrate skills necessary for conducting research related to content knowledge : skills.         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Acquired Analytical, Mathematical skills for solving engineering problems.         Ability to design and concepts in advanced materials and devices.         Ability to design and conduct experiments as well as function in a multi disciplina         Generate analytical thought to interpret results & place them within a broader conting of Course Outcomes with Program Outcomes (POS)         YOS       PO       PO       PO       PO       PO       PO       PO1       PO1         H       H       M       M       I       M       M         H       H       H       M       M       I       M	8002       Prerequisite : None       2       0/1       0/0         L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab       OBJECTIVES :         • Design, conduct experiment and analyze data.       • Develop a Scientific attitude at micro and nano scale of materials         • Understand the concepts of Modern Physics       • Apply the science of materials to Engineering & Technology         COURSE OUTCOMES (Cos) : (3 – 5)         Students completing the course were able to         Demonstrate skills necessary for conducting research related to content knowledge and labo skills.         Apply knowledge and concepts in advanced materials and devices.         Acquired Analytical, Mathematical skills for solving engineering problems.         Ability to design and conduct experiments as well as function in a multi disciplinary teams         Generate analytical thought to interpret results & place them within a broader context         ing of Course Outcomes with Program Outcomes (POs)         YOS       PO       PO       PO       PO       PO10       PO12       PO14       5       6       9       1       1         H       H       M       M       L       M       I       I       I       I       I       I       I       I       I       I       I<	

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**BPH18002** 

**ENGINEERING PHYSICS - II** 

### **OUANTUM PHYSICS** UNIT I

Ouantum free electron theory - deBroglie waves - derivation of deBroglie waves - Davisson and Germer experiment - uncertainty principle - electron microscope - scanning electron microscope - physical significance of wave function - Schrodinger wave equation and its applications - Fermi energy- effective mass - phonons - Fermi function-density of states - origin of bandgap in solids - 1D scattering of electrons in periodic potential.

# UNIT II SEMICONDUCTORS

Introduction - properties of semiconductors - classification of semiconductor - effect of temperature in semiconductor - hole current - carrier concentration in intrinsic semiconductor (electron and hole density) variation of Fermi energy level and carrier concentration with temperature in an intrinsic semiconductor carrier transport - diffusion - drift - mobility - Hall effect - determination of Hall coefficient and its applications - diodes.

# UNIT III LIGHT SEMICONDUCTOR INTERACTION

Types of electronic materials: metals, semiconductors and insulators - qualitative analysis of extrinsic semiconductor & its applications - optical transition in bulk semiconductors: absorption, spontaneous and stimulated emission - exciton and its types - traps and its types - colour centers and its types and importance - luminescence - classifications of luminescence based on excitation - optical loss and gain - Photovoltaic effect - Photovoltaic potential - spectral response - solar energy converters - solar cells.

# UNIT IV OPTO ELECTRONIC DEVICES

Photodetectors - photoconductors - photodiodes principle, construction, working and characteristics Phototransistors - Laser diodes - LED theory, construction and working - seven segment display, advantages of LED - LCD theory, construction and working.

# UNIT V ENGINEERED MATERIALS

Classification of engineered materials - nano phase materials - its synthesis and properties - shape memory alloys and its applications - biomaterials - non linear materials - metallic glasses - metamaterials homo and hetero junction semiconductors - semiconducting materials for optoelectronic devices - quantum wells, wires and dots.

# **TEXT BOOKS**

- 1. P.K. Palanisamy, Semiconductor Physics and Optoelectronics, Scitech Publications, 2010
- 2. Jyoti Prasad Bandyopadhyay, Semicoductor Devices, S. Chand Publications, 2014
- 3. Charles Kittal, Introduction to Solid State Physics, Wiley Publications, 2012

# **REFERENCE BOOKS**

- 1. S. Shubhashree, S. Bharathi Devi & S. Chellammal Madhusudanan, Engineering Physics, Sree Lakshmi Publications. 2004
- 2. G. Senthil Kumar, N. Iyandurai, & G. Vijayakumar, Material Science, VRB Publishers, 2017
- 3. R.Murugeshan & Kiruthigasivaprakash, Modern Physics, 14th edition, S. Chand & Co, 2008
- 4. Pallab Bhattacharya, Semiconductor optoelectronic devices, second edition, Pearson Education, 2003
- 5. V Rajendran & A. Marikani, Materials Science, Tata McGraw-Hill, New Delhi, 2004

# 9HRS

9HRS

# 9HRS

9HRS

# B.Tech – Civil Engineering - 2018 Regulation

0/1 0/0 3

9HRS

2

Total no. of Periods: 45



# DEPARTMENT OF CHEMISTRY

DUIII	8002	de :	Subject	Name :	ENGIN	EERI	NG CH	EMIST	'RY – II	L	T/SLr	P/R	C		
			Prereat	uisite : N	one					2	0/1	0/0	3		
			': Tutorial	SLr : S	upervis			: Project	R : Re				0		
		<ul> <li>OBJECTIVES :</li> <li>Imparting the basic concepts of phase rule and apply the same to one and two component systems.</li> <li>Introducing the chemistry of engineering materials such as cement, lubricants, abrasives, refractories, alloys and nano materials.</li> <li>To impart a sound knowledge on the principles of chemistry involving different application oriented topics</li> <li>Introducing salient features of fuels and combustion.</li> <li>To give an overview on modern analytical techniques</li> <li>COURSE OUTCOMES (Cos) : (1 – 5)</li> <li>Students completing the course were able to</li> </ul>													
<u> </u>															
CO1 CO2	-+	Understand the science of phase equilibria and apply the phase rule to different systems.													
02		Gain an overview of Engineering Materials such as Lime, Cement, Lubricants, Abrasives, Refractories, Alloys and Nanomaterials.													
CO3			Recognize gaining th						<b>.</b>		ch as Soap	os and Det	tergents,also		
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$\frac{\text{CO1}}{\text{CO2}}$		H		H			L	Н					L		
CO3		H				<u> </u>	H						L		
<b>CO4</b>		H	М	Н	Н			Н					M		
CO5		H				Μ							H		
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Category	Basic Sciences Engg Sciences Sciences Social Social Social Social Program Electives Electives Practical /								Practical / Project	Internshin	s / Technical Skills	Soft Skills			



**BCH18002** 

# **ENGINEERING CHEMISTRY – II**

### **UNIT I** PHASE EQUILIBRIA

Introduction – Definition of terms involved in phase rule. Derivation of Gibbs phase rule – Applications to one component system – water system. Binary system – Eutectic system – Pb – Ag system, Bi – Cd system . Thermal analysis - Cooling curves.

### UNIT II MATERIAL CHEMISTRY

Cement – Manufacture, Chemistry of setting and hardening .Lubricants – Requirements of good lubricants, Mechanism, Properties of lubricants, Classification - Examples. Abrasives-Classification - Moh's scale-Hard and soft abrasives, Preparation of artificial abrasives (silicon carbide, boron carbide), Applications of abrasives. Refractories – Classification, Properties-Refractoriness, RUL, Porosity, Thermal spalling Alloys Classification of alloys – Purpose of making alloys - Ferrous and non-Ferrous alloys - Heat treatment Nano materials – properties, carbon nano tubes – properties, fabrication – carbon arc method, laser vapourization method.

### UNIT III APPLIED CHEMISTRY

Soaps and detergents : Soaps – Saponification of oils and fats, manufacture of soaps, classification of soap – soft soap, medicated soap, herbal soap, shaving soap and creams.

Detergents – Anionic detergents – manufacture and applications, Comparison of soaps and detergents.

Rocket propellants and explosives: Rocket propellants – characteristics, solid and liquid propellants – examples. Explosives- Introduction, characteristics, classification, Oxygen balance, preparation, properties and uses of detonators, low explosives and high explosives, Dynamites, Gun cotton, Cordite.

Food adulterants- Common adulterants in different foods – milk and milk products, vegetable oils, and fats, spices and condiments, cereals, pulses, sweetening agents and beverages, Contamination with toxic chemicals – pesticides and insecticides.

### **FUELS & COMBUSTION UNIT IV**

Introduction to Fuels – classification – Calorific value – GCV, LCV. Solid Fuels–Coal-Proximate Analysis, Metallurgical Coke-Manufacture of Metallurgical Coke - Liquid Fuel-Refining of Petrol, Synthetic Petrol-Manufacturing Process-Hydrogenation of Coal, Polymerization, Cracking-Knocking-Octane Number-Leaded Petrol (or) Anti-knocking - Cetane Number-Ignition Lag-Gaseous fuels-CNG-LPG-Water Gas, Producer gas-Biogas- Combustion- Flue Gas analysis- Orsat's method.

### ANALYTICAL AND CHARACTERIZATION TECHNIQUES UNIT V

Electron microscopes: Scanning electron microscope & Transmission electron microscope, instrumentation and applications Absorption and Emission Spectrum - Beer - Lambert's law. Visible and UV Spectroscopy instrumentation – Block diagram - working. IR Spectroscopy – instrumentation - Block diagram – molecular vibrations – stretching and bending –  $H_2O$ ,  $CO_2$ , –Characterization of some important organic functional groups. Chromatographic techniques – column, thin layer and paper.

# Total number of periods : 45

# TEXTBOOKS

- 1. C. S.Unnithan, T. Javachandran & P. Udhavakala, "Industrial Chemistry", Sreelakshmi Publications (2009).
- 2. Dr.R.Sivakumar and Dr.N.Sivakumar" Engineering Chemistry" Tata McGraw Hill Publishing Company Ltd, Reprint 2013.

# REFERENCES

- 1. P.C. Jain & Monika Jain, "Engineering Chemistry", DhanpatRai publishing Co., (Ltd.) (2013).
- 2. B. R. Puri , L.R. Sharma & M.S. Pathania, "Principles of Physical Chemistry", Vishal publishing co., (2013).

# 8HRS

10HRS

3

2 0/1 0/0

9HRS

9HRS

# 9HRS



# DEPARTMENT OF ENGINEERING SCIENCES

Subje				Subject	Name :	ENV	IRONN	1ENTA	AL S	CIE	ENCE	]	L	T/SLr	P/R	С
BES1	800.	3		(Non- C	Credited	)										
				Prerequ	isite : No	one								-	-	-
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				F: Tutoria heory / La						roje	ct R:F	Research	1 C: C	redits		
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				known al												
CO2				•	•									lear Pollut		
			Wa	aste mana	gement a	and id	entify th	ne impo	ortan	ce o	f natura	l resour	ces lik	e forest, w	vater, ar	id food
			res	Waste management and identify the importance of natural resources like forest, water, and food resources												
CO3			To discover water conservation and watershed management													
CO4			То	To identify its problems and concerns climate change, global warming, acid rain, ozone layer												
			dej	To identify its problems and concerns climate change, global warming, acid rain, ozone layer depletion etc.,												
CO5			То	explain f	amily we	elfare	program	mes an	d ro	ole o	f inforn	nation te	chnol	ogy in hur	nan hea	lth
			an	d environi	nent											
	Ma	ppin	g of	Course C	Outcome	s with	Progra	am Out	tcom	nes (	POs)					
COs/		PO	_	PO2	PO3	PO	PO	PO	PC		<b>PO8</b>	PO	<b>PO1</b>	PO1		PO1
						4	5	6				9	0	1		2
CO1 CO2								M M	I I	1 I	Μ		M			M M
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CO4								M	I		M		Μ			M
CO5								Μ	I	I			Μ			М
	<b>H</b> /	M/L i	ndio	cates stre	ngth of c	correla	ation I	H – Hig	gh, N	1 – I	Mediun	n, L–I	Low			
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ory		es		es	Humanities & Social	es	E	in res			/es	cal / t		Internships / Technical Skills		Soft Skills
Category		Basic Sciences		Engg Sciences	Humanit & Social	Sciences	Program core	Program Electives		Open	Electives	Practical Project		Internship Technical Skills		ft S
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B.Tech – Civil Engineering - 2018 Regulation



**BES18003** 

ENVIRONMENTAL SCIENCE (Non- Credited)

# UNIT I ENVIRONMENT AND ECOSYSTEM

Definition, Scope and Importance of environment – need for public awareness – concept, structure and function of an ecosystem - producers, consumers and decomposers – energy flow in the ecosystem. Biodiversity at national and local levels – India

# UNIT II ENVIRONMENT POLLUTION

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Nuclear hazards (g) E-Wastes and causes, effects and control measures

# UNIT III NATURAL RESOURCES

Forest resources: Use and over-exploitation, deforestation. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems.

# UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns climate change, global warming, acid rain, ozone layer depletion, nuclear accidents ,central and state pollution control boards- Public awareness.

# UNIT V HUMAN POPULATION AND THE ENVIRONMENT

# TEXT BOOKS

- 1. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education (2004).
- 2. Benny Joseph, 'Environmental Science and Engineering', Tata McGrawHill, NewDelhi, (2006).

# REFERENCES

- Vairamani, S. and Dr. K. Sankaran. Elements of Environmental and Health Science. Karaikudi: KPSV Publications, 5th Edition, July, 2013.
- 2. If thikarudeen, Etal, Environmental Studies, Sooraj Publications, 2005.
- 3. *R.Murugesan, Environmental Studies, Millennium Publishers and Distributors, 2nd Edition, July, 2009.*



# Department of Civil Engineering DEPARTMENT OF ENGLISH

Subject BEN18F			Subje	ct Name	e: CO	MMUN	NICAT	<b>'IO</b>	NL	AB	L	T/SI	r	P/R	(	C
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		T/L/E	TL : Th	eory / La	ab / E	mbedde	d Theo	ory a	and	Lab	-					
		OBJE	ECTIVE													
		•	0				-					cabulary				
		•					·				0,	describir	ig and	report	writing	5
		•		Learn to keep the simple conversations in day to day life Get to know certain life skills such as marketing, advertising and do presentation												
		•	Get to know certain life skills such as marketing, advertising and do presentation Improve the reading skill with comprehension													
			OURSE OUTCOMES (COs): $(3 - 5)$ udents completing the course would be able to													
		Students completing the course would be able to														
CO1		strengthen their active vocabulary and appropriate language usage through reading poems,														
		stories, texts, newspapers, magazines and research articles														
000																
CO2			use appropriate technical vocabulary in interpreting data													
CO3			enga	engage effectively in role-play, dialogue, conversation and interviews												
CO4			equi	p them	for ef	fective	intera	ctio	n w	ith pe	ople in	all situa	ations	both	academ	ic and
			prof	essional												
CO5			learr	n English	langi	lage as	a 'life	skil	l' ar	nd prep	are for	placeme	nt inte	rviews	5	
		Mapp	oing of (	Course (	Dutco	mes wi	th Pro	gra	m (	Outcon	nes (PO	s)				
COs/POs		PO1	PO2	PO3	PO4	PO5	PO6	PO	07	PO8	PO9	PO10			PO11	PO12
CO1					Н							Η				Н
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CO4					Н						Н	Н				Н
CO5					Н						Н	Η				Н
		H/M/I	indicate	es strengt	h of co	orrelatio	n H-	High	ı, M	– Med	ium, L -	- Low			·	
Category	Basic	Sciences	Engg Sciences	Humaniti es &	Social	Program core	Program Electives		Open	Electives	Practical / Project			Internshi ns /	Technica I Skills	Soft Skills



BEN18ET1	COMMUNICATION LAB	0 0/1 2/0 1
<b>UNIT I</b> Listening and Speaking-1	Informal and Formal Contexts	6
<b>UNIT II</b> Compeering -Anchoring -	Group Discussion	6
<b>UNIT III</b> Poster Presentation -Welc	come Speech -Vote of Thanks	6
<b>UNIT IV</b> Formal Presentation -Pow	ver point presentation of charts/ Diagrams	8
<b>UNIT V</b> Facing an Interview- Mod	ck Interview	4

# **SUGGESTED READINGS:**

(i) Practical English Usage. Michael Swan. OUP. 1995.
(ii) Remedial English Grammar. F.T. Wood. Macmillan.2007
(iii) On Writing Well. William Zinsser. Harper Resource Book. 2001
(iv) Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
(v) Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
(vi) Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press
(vi) Pronunciation in Use, Mark Hancock. Cambridge University Press. 2012



# **Department of Civil Engineering DEPARTMENT OF MECHANICAL ENGINEERING**

SubjectC BES18ET		Subje	ect Na	me : BA	ASIC EI	NGINEI	ERING (	GRAPHI	CS I	<b>T</b> /	SLr	P/R	С
	-	Prere	quisite	e : None					1	1 (	)/0	2/0	2
						•	1 Learnin eory and 1		ect R :	Researc	h C: Cred	lits	
	<ul> <li>OBJECTIVES :         <ul> <li>Learn to know what kind of pencils to be used to sketch lines, numbers, Letters and Dimensioning in drawing sheet.</li> <li>Draw Projection of points, line, planes and solids using Drafters</li> <li>To identify the angle of projection and development of surfaces, isometric projection and Orthographic projection</li> <li>Know the basics of elevation and plan of building.</li> <li>Learn the basics of Drafting using AutoCAD Software</li> </ul> </li> <li>COURSE OUTCOMES (Cos) : (3 – 5)         <ul> <li>Students completing the course were able to</li> </ul> </li> </ul>												
CO1	Utilize the concept of Engineering Graphics Techniques to draft letters, Numbers,           Dimensioning in Indian Standards												
CO2						fting pra applicat		ualizatior	and pro	ojection	skills usef	ful for con	nveying
CO3			Ider	tify bas	ic sketcł	ning tech	iniques of	fenginee	ring equ	ipments			
CO4			Den	nonstrat	e the pro	jections	of Points	s, Lines, I	Planes a	nd Solid	s.		
CO5			Dra	w the se	ctional v	view of s	imple bu	ildings aı	nd utiliz	e Auto C	CAD Softw	vare.	
I	Ma	pping	of Co	urse Ou	itcomes	with Pr	ogram O	utcomes	(POs)				
COs/POs	PO	1 PO	02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	Н		H	Н	Μ	Μ	М			Н	Н		Н
CO2	Н		H	Н	Μ	Μ	М			Н	Н		Н
CO3	Н		H	Н	L		Μ			Μ	Μ		М
CO4	Н		H	Μ	Μ		Н		Μ	Н	Н		Н
CO5	Н		H	Н	Μ	Н	L		Μ	Η	Н		Н
	H/N	1/L in	dicate	s streng	gth of co	rrelatio	n H–H	ligh, M –	Mediu	m, L –	Low	1	1
Category	Basic Sciences		Engg Sciences	Humaniti	es & Social Sciences	Program core	Program Electives	Open	FICCIIVES	Project	Internship s / Technical	Skills	Soft Skills



Dr.M.G.R.

# **Department of Civil Engineering**

# BES18ET2BASIC ENGINEERING GRAPHICS1 0/0 2/0 2

# **CONCEPTS AND CONVENTIONS (Not for examination)**

Introduction to drawing, importance and areas of applications – BIS standards – IS: 10711 - 2001: Technical products Documentation – Size and layout of drawing sheets – IS 9606 - 2001: Technical products Documentation – Lettering – IS 10714 & SP 46 - 2003: Dimensioning of Technical Drawings – IS : 15021 - 2001: Technical drawings – Projections Methods – drawing Instruments, Lettering Practice – Line types and dimensioning – Border lines, lines title blocks Construction of polygons – conic sections – Ellipse, Parabola, Hyperbola and cyloids.

# UNIT I PROJECTION OF POINTS, LINES AND PLANE SURFACES

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – projection of polygonal surface and circular lamina in simple position only.

# UNIT II PROJECTION OF SOLIDS

Projection of simple solids like prism, pyramid, cylinder and cone in simple position Sectioning of above solids in simple vertical position by cutting plane inclined to one reference plane and perpendicular to the other.

# UNIT III DEVELOPMMENT OF SURFACES AND ISOMETRIC PROJECTION 6HRS

Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders, and cones. Principles of isometric projection – isometric scale – isometric projections of simple solids, like prisms pyramids, cylinders and cones.

# UNIT IV ORTHOGRAPHICS PROJECTIONS

Orthographic projection of simple machine parts – missing views

# **BUILDING DRAWING**

Building components – front, Top and sectional view of a security shed.

# UNIT V COMPUTER AIDED DRAFTING

Introduction to CAD – Advantages of CAD – Practice of basic commands – Creation of simple components drawing using CAD software.

Total No. of periods:30

# Note:First angle projection to be followed.

# **TEXT BOOKS**

- 1. Bhatt, N.D. and Panchal, V.M. (2014) Engineering Drawing Charotar Publishing House
- 2. Gopalakrishnan, K.R. (2014) Engineering Drawing (Vol.1& II Combined) Subhas Stores, Bangalore.

# **3HRS**

# 6HRS

6HRS

**6HRS** 

### **3HRS**



Subject Constraints BES18L0			bject N CIENCI	ame : INTE			<u>CIVII EII</u> IYSICAL			L	T/SLr		P/R	С
		Pre	erequisi	te : None						0	0/0		2/0	1
				T : Tutorial Theory / Lal					Project	R : R	esearch (	C: Cro	edits	
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CO2				Construct an electronic system		pare the	e propertie	es of va	riety o	f med	chanical,	optic	al, elec	trical and
CO3			F	Familiarizing	g the tit	tration m	ethods usi	ng conc	luctom	etry &	z potentic	ometry	y	
CO4		Ma	s	Developing t kills. of Course O							Cheminfo	ormati	cs & An	alytical
COs/POs	• P 0 1		PO2	PO3	<b>PO</b> 4	PO5	PO6	PO7	PO8	PO	)9 P(	)10	PO1 1	PO12
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CO2	H		Η	M	Η	Н					I	М		
CO3	H		Н	М	Η	Н				H	I			
CO4	H		Η	Н	Η	Н				H	I		Н	М
		H/N	/I/L ind	licates stren	gth of	correla	tion H –	High, N	A – Me	dium	, L – Lo	W		
Category	Basic Sciences		Engg Sciences	Humaniti es &	Sciences	Program core	Program Electives	Open Electives	Decotion1 /	Project	Internship s /	Technical	Soft Soft Skills	



**BES18L02** 

## Department of Civil Engineering

INTEGRATED PHYSICAL SCIENCE LAB

0 0/0 2/0 1

#### LIST OF EXPERIMENTS

- 1. Determination of Coefficient of Viscosity of a given liquid by Poiseuille's method.
- 2. Particle Size determination using Laser Source.
- 3. Determination of Numerical Aperture of an Optical Fiber.
- 4. Spectrometer- Refractive Index/Dispersive power/i-d curve.
- 5. Potentiometer Resistance of a wire.
- 6. Transistor Characteristics Input Resistance, Output Resistance and Gain .
- 7. Studies on acid-base conductometric titration.
- 8. Determination of redox potentials using potentiometry.
- 9. Determination of R_f values of various components using thin layer chromatography.
- 10. Viscosity studies using Digital capillary viscometer.
- 11. Compute the structures of the given polymers, drugs, biomolecules usingChem Draw.
- 12. Studies on potential energy surface of the given molecules.
- 13. Estimate NMR spectra from a Chem Draw structure.



### **Department of Civil Engineering DEPARTMENT OF COMPUTER SCIENCE**

Subject ( BES18E		Subjec	t Name	C PR	OGRAM	IMING A	AND LA	В	L	T/ SL r	P/I	R	С
		Prerequ	isite : N	lone					1	0/0	2/0	)	2
						pervised I ded Theor	•		oject R	: Res	earch C:	Credits	
		<ul><li>App</li><li>Proc</li></ul>	line the l ly funda luce and	basics of amentals l present	activitie	gramming s associate		the cou	rse.				
					S (Cos) : course w	(3-5) were able t	0						
CO1			Acqui	ire know	ledge ho	w to write	e and exe	ecute c	progra	ms			
CO2			Under	rstand th	e fundan	nental exp	ression	and sta	tements	s of C	Languag	e.	
CO3			Work	with arr	ays, func	ctions, poi	nters, st	ructure	s, Strin	gs and	d Files in	C.	
CO4			Identi	fy and p	rovide so	olutions fo	r engine	ering p	roblen	ns in C	C program	ming	
		Mappin	ig of Co	urse Ou	itcomes v	with Prog	ram Ou	itcome	s (POs	)			
COs/POs	F PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO	)9	PO10	PO1 1	PO12
CO1	Н	Н			M	M		Н		Μ		1	Н
CO2	Н	М			Н	M		M		н			М
CO3	Н			Н		М		Μ		н			М
CO4	Н			М		М		Н		Μ			М
		H/M/L	indicate	s streng	th of co	relation	H – Hi	gh, M	– Med	ium,	L – Low	1	L
Category	Basic Sciences	Engg Sciences	Humanitie	s & Social Sciences	Program core	Program Electives	Open	Electives	Practical / Project		Internships / Technical Skills		Soft Skills



C PROGRAMMING AND LAB

#### **BES18ET3** UNIT I **INTRODUCTION**

Fundamentals, C Character set, Identifiers and Keywords, Data Types, Variables and Constants, Structure of a C Program, Executing a C Program.

#### UNIT II EXPRESSION AND STATEMENT

Operators, Types-Complex and Imaginary, Looping Statement-For, While, Do, Break, continue, Decision Statement-If, If else, Nested if, Switching Statement, Conditional Operator.

#### **UNIT III ARRAYS AND FUNCTIONS**

Defining an Array, Using Array elements as counters, Generate Fibonacci number, Generate Prime Numbers, Initializing Arrays, Multidimensional Arrays, Defining a Function, Function call -types of Function calls -Function pass by value -Function pass by reference, Write a Program in Recursive Function.

#### UNIT IV STRUCTURES AND

#### POINTERS

Working with Structures -Introduction -Syntax of structures -Declaration and initialization -Declaration of structure variable -Accessing structure variables, Understanding Pointers -Introduction -Syntax of Pointer.

6HRS

#### UNIT V STRINGS AND FILE HANDLING

Strings -Syntax for declaring a string -Syntax for initializing a string -To read a string from keyboard, Files in C -File handling functions -Opening a File closing a file --example: fopen, fclose -Reading data from a File- Problem solving in C

- 1. www.spoken-tutorials.org
- 2. http://www.learn-c.org/

#### **REFERENCE** :

- 1. Stephen G. Kochen" Programming in C-A complete introduction to the C Programming Language. Third Edition, Sams Publishing -2004
- 2. Ajay Mital, "Programming in C: A Practical Approach", Pearson Publication-2010

#### LIST OF PROGRAMS

- 1. Write a program to check 'a' is greater than 'b' or less than 'b' Hint: use if statement.
- 2. Write another program to check which value is greater 'a', 'b' or 'c'. Hint: use else-if statement. (Take values of a, b, c as user inputs)
- 3. Write a Program to find the sum of the series :  $x + X^{3/3}! + X^{5/5}! + \dots X^{n/n!}!$
- 4. Write a C Program to solve a Quadratic Equation by taking input from Keyboard
- 5. Write a C Program to arrange 20 numbers in ascending and descending Order. Input the Numbers from Keyboard
- 6. Write a C Program to Multiply a 3 x 3 Matrix with input of members from Keyboard
- 7. Write a program that takes marks of three students as input. Compare the marks to see which student has scored the highest. Check also if two or more students have scored equal marks.
- Write a program to display records of an employee. Like name, address, designation, salary. 8.
- Write a C program, declare a variable and a pointer. Store the address of the variable in the pointer. Print 9. the value of the pointer.
- 10. Write a C program to concatenate String 'best' and String 'bus'. Hint: strcat(char str1, char str2);
- 11. Explore the other functions in string library.
- 12. Write a program to create a file TEST. Write your name and address in the file TEST. Then display it on the console using C program.



#### Total No of Periods: 30

# 6HRS

#### 6HRS

### 6HRS

6HRS

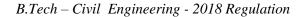
1 0/0 2/0 2



# **III SEMESTER**



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L : Lecture '					sed Lea	rning	P : Pro	oject	R : Re	searc	h C: Crea	lits 7	T/L/ETL :
Theory/Lab/E		d Theory	and Lab										
OBJECTIVE		г .				. 1.		1. (					., .
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COURSE OU	_			_		1							
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CO2			stand the l		*	*							
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CO3					*				al heat a	and wa	ave equation	ons	
CO4	]	To unders	stand the l	basic con	ncepts ir	n Laplac	e Transf	forms					
CO5	]	To unders	stand the l	oasic coi	ncepts ir	n Fourie	r transfo	rms					
Mapping of C	Course	Outcome	es with Pr	rogram	Outcon	nes (PO	s)						
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO	10 P	011	PO12
CO1	Н	Н		Н					Μ				
CO2	H	Н		Н					М				
C03	Н	Н		Н					М				
C04	Н	Н		Н					М				
C05	Н	Н		Н					М				
COs / PSOs	PSO1		PSO2	1									
CO1	H		Μ										
CO2	Н		М										
C03	Н		М										
C04	Н		Μ										
C05	H		Μ										
H/M/L indica	tes Str	ength of	Correlat	ion H	• High, I	M- Med	lium, L-	Low			I		
						ves		, cill					
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	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical Project	Internships Technical Skill	Soft Skills				
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	γ												





Dr.M.G.R.

Subject	Subject Title :	Ty/Lb/	L	T/ S.Lr	<b>P</b> /	С
code:	MATHEMATICS III FOR MECHANICAL	ETL			R	
BMA18005	& CIVIL ENGINEERS		3	1/0		4
		Ту			0/0	

#### **UNIT I PARTIAL DIFFERENTIAL EQUATIONS**

Formation of PDE by eliminating arbitrary constants and eliminating arbitrary functions – Solutions of standard types of first order equations – Lagrange's equation – Linear partial differential equations of second and higher order with constant coefficients.

### **UNIT II FOURIER SERIES**

Dirichlet's conditions – General Fourier series – Half range Sine & Cosine series – Complex form of Fourier series - Parseval's identity - Harmonic Analysis.

### UNIT III APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS

Classification of second order linear partial differential equations – Solutions of one dimensional wave equation, one-dimensional heat equation – Steady state solution of two dimensional heat equation (Cartesian coordinates only) – Fourier series solutions.

### UNIT IV LAPLACE TRANSFORMS

Transforms of simple functions – Properties of Transforms – Inverse Transforms – Transforms of Derivatives and Integrals – Periodic functions – Initial and final value theorems – Convolution theorem – Applications of Laplace transforms for solving linear ordinary differential equations up to second order with constant coefficients and Linear simultaneous differential equations of first order with constant coefficients.

### UNIT V FOURIER TRANSFORMS

Statement of Fourier integral theorem – Fourier transform pairs – Fourier Sine and Cosine transforms – Properties - Transforms of simple functions - Convolution theorem - Parseval's theorem.

### **TEXT BOOKS**

- Veerarajan T., "Engineering Mathematics" (for first year), Tata McGraw Hill Publishing Co(2008). 1.
- 2. Veerarajan T., "Engineering Mathematics" (for semester III), Tata McGraw Hill Publishing Co. (2005).
- 3. Singaravelu, "Transforms and Partial Differential Equations" Meenakshi Agency, (2017).

### REFERENCES

- Kreyszig E, "Advanced Engineering Mathematics" (9th ed.), John Wiley & Sons, (2011). 1.
- 2. Grewal B.S, "Higher Engineering Mathmatics", Khanna Publishers, (2012).

#### 12HRS

# **12HRS**

**12HRS** 

# **12HRS**

### **Total No. of Hours: 60**

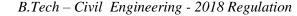


**12HRS** 





Subject Code	. 6	ubject Na		epar in		I CIVI	Engi		ng Ty/L	L	Τ/	<b>P</b> /	С
BCE18001		ubject Ina		IANICS	S OF SC	OLIDS			b/ ETL	L	S.Lr	R	C
	Р	rerequisit	e: None						Ty	3	1/0	0/0	4
L : Lecture T :				sed Leai	rning P	: Projec	t R:Re	esearch	n Č: Cr	edits			
T/L/ETL : The	eory/L	ab/Embed	lded Theo	ory and l	Lab								
OBJECTIVE	:												
		damental	concepts	of Stres	s, Strain	and def	ormatio	on of so	oild ap	plicati	ons of ba	rs and t	hin
cylind													
		mechanis						stress	resulta	ants ar	nd deform	nations.	
		nd the effe											
		l complex			state of	stress a	nd plane	e truss	es				
COURSE OU													
CO1					l conce	pts of s	stress ar	nd stra	ain in	the de	esign of	various	structural
		componei											
CO2		To analyz		•			<u> </u>						
C03		To analyz											
C04		To detern of loads	nine the b	ending,	shear st	resses a	nd defle	ection	produc	ed in	a beam s	ubjected	l to system
C05		To detern	nine stres	ses due	to impac	et and su	ddenly	applie	d loads	5			
Mapping of C	Course	Outcom	es with P	rogram	Outcor	nes (PC	s)						
COs/POs	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	P	PO1	.0	PO11	PO12
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CO1	Η			Μ									
CO2	Η		Η										М
C03	Η			Μ	L								
C04	Η	Н		Η									
C05	Η	Η				H						H	
COs / PSOs		SO1	PS	02									
CO1	Η		Н										
CO2	H		Η										
C03	Н		Н										
C04	Η		Η										
C05	Η		Η										
H/M/L indica	tes St	rength of	Correlat	tion H	- High,	M- Me	dium, L	-Low					1
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships /	Soft Skills				
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	MECHANICS OF SOLIDS	Ту	3	1/0	0/0	3
Subject code: BCE18001	Subject Title :	Ty/Lb/ ETL		T / S.Lr	P/ R	

Equivalent system of forces, rigid bodies, external & internal forces-Application of Statics of Particles-Free body Diagram Concurrent & Non Concurrent Forces - Principles of transmissibility- Equivalent forces & Varignon's theorem. Tension, Compression and Shear stress - Lateral Strain- Poisson's Ratio- Volumetric Strain -Deformation of Simple and Compound Bars - Elastic constants - Composite Sections .

#### UNIT II **CENTRE OF GRAVITY AND MOMENT OF INERTIA**

Areas and volumes - Centroid of simple areas and volumes by integration - Centroid of composite areas - Second moment of areas - Radius of Gyration - Parallel axis and Perpendicular axis theorems - Moment of Inertia of simple areas by Integration -Moment of Inertia of Composite Areas - Mass Moment of Inertia of thin plates and simple solids.

#### UNIT III **BENDING MOMENT & SHEAR FORCE**

Introduction to Bending and S.F. Beams and support conditions – types of supports – types of loads - shear forces and bending moment diagrams for simply supported beams, cantilevers and overhanging beams with all loads. ANALYSIS OF STATICALLY DETERMINATE PLANE TRUSSES **UNIT IV 12 HRS** 

Stability and equilibrium of plane frames – Perfect frames - Types of Trusses – Analysis of forces in trusses member - Method of joints - Method of Sections - Tension co-efficient method - Graphical method

#### UNIT V **BENDING STRESS IN BEAMS & TORSION OF SHAFTS 12 HRS**

Theory of simple bending-expression for bending stress-Section modulus-bending stress in symmetrical sections-Theory of torsion-Torsion of circular, hollow circular shafts and power -close coiled helical springs and leaf springs

#### **Total No of Hours:60**

### TEXT BOOKS

- 1. Rajput.R.K. "Strength of Materials", S.Chand and Co, New Delhi, 2007. 2.
- 2. Bhavikatti. S., "Solid Mechanics", Vikas publishing house Pvt. Ltd, New Delhi, 2010 * Dr.R.K.Bansal A text book of Strength of Materials, Laxmi Publications, New Delhi 1996.

#### 3. S. Ramamirutham and R.Narayanan, Strength of Materials, Dhanpat Rai Publications, New Delhi, 1989. REFERENCES

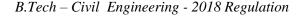
- 1. Kazimi S.M.A. " Solid Mechanics ", Tata McGraw Hill Publishing Company, New Delhi, 1991.
- 2. Laudner T.J. and Archer R.R., " Mechanical of Solids in Introduction ",McGraw Hill International **Editions**
- 3. William A.Nash, "Theory and Problems of Strength of Material" Schaum's outline series, Mc Graw Hill International Editions 1994

#### **12 HRS**

#### **12 HRS**



Subject Code BCE18002	: S	ubject Na		DINC		DIATS			Ty/Lb/	L	T/	<b>P/ R</b>	C
BCE18002		••.		DING	MATE	KIALS			ETL	2	S.Lr	0./0	
	P	rerequisit	e: None						Ту	3	0/0	0/0	3
L : Lecture T :	Tutori	al SLr :	Supervis	ed Learr	ning P:	Project	R : Res	earch C	C: Credits				
T/L/ETL : The	eory/La	b/Embed	ded Theor	y and L	ab								
OBJECTIVE				-									
• To im	part kn	owledge (	on differe	nt mater	ials and	properti	ies						
• To uno	derstan	d the engi	ineering a	spects re	elated to	buildin	gs						
<b>COURSE OU</b>	TCON	AES (CO	s) : ( 3- 5)	)									
At the end of t	he cou	rse, the st	udent will	be able									
CO1	]	Identify a	nd charac	terize bu	uilding n	naterials	5						
CO2			nd the mai					d cemer	nt				
CO3			clear und										
Mapping of C													
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	<b>PO9</b>	<b>PO10</b>	PO1	1 PO	12
CO1	Η	_									Μ		
CO2	Н				Μ	Μ							
CO3	Н								Μ			Μ	
COs / PSOs	P	<b>SO1</b>	PSC	02		•		•					
CO1	Η		Н										
CO2	Η		Н										
C03	Η		Н										
H/M/L indica	tes Str	ength of	Correlati	on H-	High, N	M- Med	ium, L-	Low		·			
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Arogram Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
				N									



	Subject	Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	<b>P/ R</b>	С
	code:	<b>BUILDING MATERIALS</b>	Ту	3	0/0	0/0	3
	BCE18002						
U	NIT I	BRICKS, AGGREGATES AND CEMEN	T				9HRS

Bricks – Classification – Manufacturing process – Test on bricks – Aggregate: Natural Stone Aggregate – Industrial By- product - Crushing strength, impact strength, and flakiness - Abrasion resistance - Grading - sand - Bulking. Cement: Cement Ingredients - Manufacturing Process - Types - Testing of Cement

#### UNIT II **MASONRY& MORTAR**

Masonry - stone masonry - rubble and Ashlar masonry - Brick masonry - Bond - Definition need and scope -Types of bonds - English and Flemish bond - merits and demerits - composite masonry - solid and hollow block masonry-soil-cement bricks-Load bearing and non-load bearing walls- Codal provisions. Mortar – Preparation of Lime and Cement Mortar- Concrete - Ingredients - Manufacturing Process - Batching Plant - Ready Mix Concrete - Paints - Plastics - Glass

#### UNIT III SUB STRUCTURE AND SUPER STRUCTURE

Substructure – Setting Out of Foundation and Trenches – Excavation and Timbering – Foundation – Shallow Foundation - Deep Foundation. Super Structure.

#### **UNIT IV** FLOOR, ROOF & STAIR CASE

Floors - Types of floor - Details of concrete and terrazzo floors - Roofs - Types of Roofs - Types of Flat roofs sloping roofs -different types and usage - shell roofs - roof coverings-AC sheets-GI sheets-FRP roofs Water proofing treatment of roofs -tar felt treatment- chemical treatment- Types of weathering courses .Stair Case -Definition – Types of Stair – General Dimension and Requirements – Layout of Stair Case.

#### UNIT V **BUILDING SERVICES**

Damp Proofing- Acoustics Treatment - Thermal Insulation - Fire Protection - Ventilation - Earth Quake Protection- Integration of services in buildings - water supply & plumbing layout for a residential building elevators & escalators - planning & installation - basic components of the electrical system for a residence .

### TEXT BOOKS

- 1. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, "Building Construction" Laxmi Publications (P) ltd., New Delhi.
- 2. Rangwala, Charotar Publishing 8th ed.1983. *S.C.* Engineering Materials, House, Arora S.P. and Bindra S.P., Building Construction, Planning Techniques and method of Construction, Dhanpat roy and Sons, 1997.

### REFERENCES

- 1. Taylor, G.D. Materials of Construction, USA Longman Inc, 1989.
- 2. Arora and Bindra, Building Materials and Building Construction, Dhanpat Raj

# 9HRS

#### 9HRS

9HRS

### **Total No of Hours: 45**





# 9HRS



Subject		Subject	Name	:					Ty/Lb/E	L	Τ/	<b>P</b> /	С
Code:			ENGIN	EERI	NG GI	EOLO	GY		TL		S.Lr	R	
BCE1800	3	Prerequi	site: No	one					Ту	3	0/0/	0/0	3
L : Lectur	re T : Tı	itorial	SLr : S	upervis	sed Lea	rning	P:Pro	ject R	: Research	C: Cre	dits		
T/L/ETL	: Theor	y/Lab/E	mbedde	d Theo	ory and	Lab							
OBJECT	TVE :												
• T	o under	stand th	e impor	tance o	of geolo	ogical k	knowle	dge suc	h as earth, o	earthqu	ake and	d to ap	oply this
k	nowledg	ge in pro	jects su	ch as d	lams, tı	unnels,	bridge	es, roads	s, airport an	d harb	or as we	ell as t	to choose
ty	pes of f	oundati	on										
COURSE	E OUTO	COMES	G (COs)	: ( 3- 5	5) At th	e end o	of the c	ourse, t	he student	will be	able to	:	
CO1	Identif	y and cl	assify ro	ock usi	ng basi	ic geol	ogic cl	assifica	tion system	s			
CO2	Unders	stand ge	ologic c	oncept	s and a	pproac	ches.						
CO3	Identi	fy the va	arious li	thologi	ical uni	ts and	its app	lication	s in civil en	igineer	ing		
Mapping	of Cou	rse Out	comes	with P	rogran	n Outc	comes	(POs)					
COs/POs	PO	PO	PO3	PO	PO	PO	PO	PO8	PO9	PO1	PO1	PC	012
	1	2		4	5	6	7			0	1		
CO1	Н						Μ				Μ		
CO2	Н						Μ				Μ		
C03	Н						Μ				Μ		
COs /	F	SO1	PS	02									
PSOs													
CO1	Н		Н										
CO2	H		H										
C03	Н		Н										
H/M/L in	dicates	Streng	th of Co	orrelat	ion I	I- Hig	<b>h, M-</b> ]	Mediur	n, L-Low	1		I	
Categor	es		nud	e		es							
У	Basic Sciences	ring	Humanities and	Core		Open Electives		Internships	lls				
	c Sc	Engineering	nanit	jram	jram	n El	Practical	terns	Soft Skills				
	Basi	Engi	Hum Secoi	Program (	Program	Opei	Prac	Int	Soft				



Subject code:	Subject Title :	L	T/S.Lr	<b>P/ R</b>	С
BCE18003	ENGINEERING GEOLOGY				
		3	0/0	0/0	3

#### UNIT I GENERAL GEOLOGY

Geology in civil engineering - branches of geology - earth structure and composition - elementary knowledge on continental drift and plate tectonics. Seismo tectonics of the Indian plate, seismic zones of India, Weathering work of rivers, wind, glaciers.

#### **UNIT II** MINERALOGY

#### Physical properties of minerals - study of rock forming minerals - quartz family. Feldspar family, augite, hornblende, biotite, muscovite, calcite, garnet - properties, behavior and engineering significance of clay minerals -fundamentals of process of formation of ore minerals - coal and petroleum - their origin and occurrence in India.

#### UNIT III PETROLOGY

Classification of Soil and Rock, Types of rock and origin: Igneous (extrusive and intrusive), sedimentary and metamorphic rocks, description occurrence, engineering properties of following rocks. Igneous rocks - granite, diorite, gabbro, pegmatite, dolerite and basalt sedimentary rocks sandstone, limestone, shale, conglomerate and breccia. Metamorphic rocks, quartzite, marble, slate, phyllite, gneiss and schist.

#### **UNIT IV** STRUCTURAL GEOLOGY AND GEOPHYSICAL METHOD

Strength Behavior of Soil and Rock, Stress and strain in rock, failure and shear failure of soil and rock, folds, faults and joints in rock, consequences of failure (earthquakes), Bearing on engineering construction. Seismic and electrical methods for civil engineering investigations.

#### UNIT V **GEOLOGICAL INVESTIGATIONS IN CIVIL ENGINEERING**

Geologic Mapping and Remote Sensing, Topographic maps, geologic maps, aerial photographs, LIDAR, SAR, interpretation for civil engineering projects - geological conditions necessary for construction of dams, tunnels, buildings, road cuttings, landslides - causes and preventions. Sea erosion and coastal protection.

#### Total No of Hrs: 45

#### **TEXT BOOKS**

- 1. Parbin singh, "Engineering and General geology", S. K. Kataria & Sons, 2009
- 2. D. Venkat Reddy "Engineering Geology", Vikas publishing House New Delhi, 2010
- 3. Krynine and Judd, "Engineering Geology and Geotechniques", McGraw Hill Book Company, New Delhi 1990.

#### REFERENCE

- 1. Legeet, "Geology and Engineering", McGraw Hill Book Company, New Delhi
- 2. Blyth, "Geology for Engineers", elbs, Pune 1995

### 9HRS

9HRS

9HRS

9HRS

# 9HRS



Subject	t Code	: Su	bject N					8-		Ty/Lb/	L	Τ/	<b>P</b> /	С
BEE18	I04			GY CON	SERV	ATION	TECH	INIQU	ES	ETL		S.Lr	R	
		Pr	erequisi	te: None						Ту	3	0/0	0/0	3
L : Lect	ure T	: Tutor	ial SL	r : Super	vised L	earning	P:Pro	ject R	: Resea	arch C: Cr	edits			
T/L/ET	L:The	eory/La	ab/Embe	edded Th	eory an	d Lab								
OBJEC	CTIVE	2:												
•	To stu	idy the	various	energy sa	aving aı	nd mana	agemen	t technio	ques ap	plied to b	uilding	and con	structi	on
	with r	elevan	ce to en	vironmen	ıt.									
COUR	SE OU	JTCO	MES (C	(0s): (3)	- 5) At	the end	of the c	course th	ne stud	ent shall				
CO1	Posse	ess kno	wledge	on basic	energy	conserv	vation s	ystems						
CO2	Desig	gn enei	gy effic	ient build	lings									
CO3	Able	to do e	energy a	udit and	identify	conser	vative 1	neasure	s					
Mappi	ng of (	Course	Outcor	nes with	Progra	ım Out	comes	(POs)						
COs/PO	Os	<b>PO1</b>	PO2	PO3	<b>PO4</b>	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PO9	<b>PO10</b>	PO1	1 PC	)12
CO1		Η	Н		Η	Н	Н	Μ	Μ					
CO2		Η	Н		Н	Н	Н	Μ	Μ					
CO3		Η	Н		Н	Н	Н	Μ	Μ					
COs / F	PSOs	PS	501	PSC	02		•							
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CO2		Η		Н										
CO3		Η		Н										
H/M/L	indica	ates Sta	rength o	of Correl	ation	H- Hig	<b>gh, M-</b> ]	Mediun	n, L-L	OW				
Catego	ory	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
			$\checkmark$											
			1	1			1	1			1			



bject Subject Title :	L	T /	<b>P/ R</b>	С
de:		S.Lr		-
EE18104 ENERGY CONSERVATION TECHNIQUES	3	0.40	0/0	3
		0/0		

#### UNIT I INTRODUCTION

Fundamentals of energy-Energy Production Systems-Heating, Ventilating and Airconditioning – Solar Energy and Conservation – Energy Economic Analysis – Energy conservation and audits – Domestic energy consumption – savings - challenges –primary energy use in buildings - Residential – Commercial – Institutional and public buildings – Legal requirements for conservation of fuel and power in buildings.

#### UNIT II ENVIRONMENTAL

 $\label{eq:energy} \begin{array}{l} \text{Energy and resource conservation} - \text{Design of green buildings} - \text{Evaluation tools for building energy} - \text{Embodied and operating energy} - \text{Peak demand} - \text{Comfort and Indoor Air quality} - \text{Visual and acoustical quality} - \text{Land, water and materials} \end{array}$ 

#### UNIT III DESIGN

Natural building design consideration – Energy efficient design strategies – Contextual factors – Longevity and process Assessment – Renewable Energy Sources and design – Advanced building Technologies – Smart buildings – Economies and cost analysis.

#### UNIT IV SERVICES

Energy in building design – Energy efficient and environment friendly building – Thermal phenomena – thermal comfort – Indoor Air quality – Climate, sun and Solar radiation, - Psychometrics – passive heating and cooling systems - Energy Analysis – Active HVAC systems - Preliminary Investigation – Goals and policies – Energy audit – Types of Energy audit – Energy flow diagram – Energy consumption / Unit Production – Identification of wastage- Priority of conservative measures.

#### UNIT V ENERGY MANAGEMENT

Energy management of electrical equipment - Improvement of power factor – Management of maximum demand – Energy savings in pumps – Fans – Compressed air systems – Energy savings in Lighting systems – Air conditioning systems – Applications .

#### REFERENCES

- 1. Moore F., Environmental Control system Mc Graw Hill, Inc. 1994.
- 2. Brown, GZ, Sun, Wind and light: Architectural design strategies, John Wiley & Sons, 1985.
- 3. Cook, J, Award Winning passive Solar Design, Mc Graw Hill, 1984.
- 4. J.R. Waters, Energy conservation in Buildings: A Guide to part L of the Building Regulations, Blackwell Publishing, 2003.

#### 9 HRS

9 HRS

### 9 HRS

9HRS

#### 9 HRS

Total No. of Hours: 45



Subject Code	: [5	Subject Na		eparti		f Civi	Engi	neern	ng Ty/L	L	Τ/	<b>P</b> /	С
BCE18L01			UILDING	G DRAV	VING F	PRACT	ICE		b/		S.Lr	R	-
									ETL				
	I	Prerequisit	e: Basic E	ngineer	ng Grap	ohics			Lb	0	0/0	3/0	1
L : Lecture T :	Tuto	rial SLr :	Supervis	ed Learr	ing P:	Project	R : Res	earch (	C: Cred	its			•
T/L/ETL : The	eory/L	ab/Embed	ded Theor	ry and L	ab								
OBJECTIVE	:												
		luce the students to draft the plan, elevation and sectional views of buildings in accordance with nent and control rules satisfying orientation and functional requirements as per National Building											
	opmen												
Code.		COMES (COs) : (3-5) At the end of the course, the student will be able to:         know about the basic principles of Building Drawing											
	TCO												
CO1				-	•		-	-					
CO2		know Bas						-	1'				
CO3	٩	Acquire knowledge on plan, elevation and section of buildings Outcomes with Program Outcomes (POs)											
	1							DOP	D	<b>PO10</b>		<b>DO11</b>	DO12
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P O	POIU		PO11	PO12
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CO2	H							M				M	
CO3	H					Μ		Μ				M	
COs / PSOs	J	PSO1	PSC	02									
CO1	Н		Н										
CO2	Н		Н										
CO3	H		Н										
H/M/L indica	tes St	rength of	Correlati	on H-	High, N	M- Med	ium, L-	Low					
								kill					
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	Basic Sciences	Engineering Scie	Humanities and Sciences	Program Core	Program Electives	Ope	Practical / Projec	Internships	Soft Skills				
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Subject	Subject Title :		Ty/Lb/ETL	L	Т	/	<b>P/ R</b>	С	
code:					S.Lr				
BCE18L01	<b>BUILDING DRAW</b>	<b>ING PRACTICE</b>	Lb	0			3/0		
					0/0			1	

#### Experiments

- 1. Basic concept, purpose, function and types of building (Residential, Industrial and Institutional)
- 2. Principles of site selection, orientation of buildings and distribution of space.
- 3. Line plan. Development of plan from a line plan.
- 4. Details of Doors, windows, foundation and stair case etc.
- 5. Single storied residential building with flat and tiled roof.
- 6. Public buildings like office, dispensary, post office, bank etc.
- 7. Factory building with trusses supported on Brick walls and pillars.

#### **Total No of Hours: 30**

#### **TEXT BOOKS**

- 1. Civil Engg. Drawing & House planning B.P.Verma, Khanna publishers, Delhi, 1990
- 2. Building drawing & detailing Dr. Balagopal & T.S.Prabhu, Spades publishers, Calicut, 1989.

#### REFERENCES

- 1. Building drawing Shah, Tata McGraw-Hill, New Delhi, 2000.
- 2. Building planning & drawing Dr. N.Kumaraswamy, A.Kameswara Rao, Charotar publishing house. Mumbai, 1997.
- 3. Shah, Kale and Patki, Building drawing, Tata McGraw-Hill New Delhi,,1998.
- 4. Balagopal T.S. Prabhu, Building drawing and detailing, Spades Publishers
- 5. Shah & Kale, Building Drawing, Tata McGraw Hill
- 6. B.P. Verma, Civil Engineering Drawing and housing Planning, Khanna Publishers



Subject Code	: S	ubject Na		cparti	nent o		Lingi		Ty/L	b	L	Τ/	P/ R	С
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		AB						_	, ETL					
		rerequisit	e: None						Lb		0	0/0	3/0	1
L : Lecture T :				ed Leari	ning P:	Project	R : Res	earch	C: Cr	edi	ts			
			I		U	5								
T/L/ETL : The	eory/La	b/Embed	ded Theor	ry and L	ab									
OBJECTIVE	:													
• Learn	the pro	perties of different materials like steel, concrete, timber, bricks and other materials avior of different structural elements and develop skill in use of measuring instruments												
• Study	the bel	navior of o	different s	structura	l elemer	nts and d	levelop s	skill i	n use o	of n	neasur	ing inst	truments	
COURSE OU	TCON	AES (CO	ES (COs) : ( 3- 5) o do tests on cement as per IS codes of practice											
CO1				_		=								
CO2			ts on fine		00	0	•					ice;		
CO3			ts on fresh				-	S code	es of $\overline{p}$	orac	tice			
Mapping of C				0			<u> </u>							
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO			PO1	0	PO11	PO12
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CO1	H			Μ					N				Μ	
CO2	H			Μ					N				Μ	
CO3	H			Μ					N	Л			Μ	
COs / PSOs		SO1	PSO	02										
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CO2	H		Н											
CO3	H		H		<u> </u>									
H/M/L indica	ites Str	ength of	Correlati	ion H-	• High, I	M- Med	ium, L-	T T						
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Subject	Subject Title :	Ty/Lb/ETL	L	Τ	<b>P/ R</b>	С
code:				S.Lr		
BCE18L02	STRENGTH OF MATERIALS	Lb	0		3/0	1
	AND CONCRETE LAB			0/0		

### STRENGTH OF MATERIALS LAB

- 1. Tension test on mild steel and for steel rods.
- 2. Compression test on wooden specimen
- 3. Double shear test on mild steel and aluminum rods.
- 4. Torsion test on mild steel rod.
- 5. Impact test on metal specimen
- 6. Hardness tests on metals like mild steel, brass, copper and aluminum.
- 7. Deflection test on metal beam
- 8. Compression test on helical spring

#### Total No of Hours: 15

#### **CONCRETE LAB**

- 1. Tests on Cement
  - a.Specific Gravity,
  - b. Normal consistency,
  - c. Initial and Final setting time of cement
- 2. Test on Aggregate

**References:** 

- a. Sieve analysis
- b. Specific gravity
- c. Water Absorption
- 3. Tests on Freshly Mixed Concrete Compaction Factor, Slump Value.

#### Total No of Hours: 15

1. Davis H.E. Trophell.G.E & Hanck, G.F.W., The Testing Of Engineering Materials – Mcgrew Hill, International Book Co.

2. Timoshenko S.P, &Young, D.H. Strength of Materials – East West Press Ltd. 3. Relevant 813 code. Venon john, Engineering Materials, 3rt Edition, McMillan Co.Ltd.,



Subject Code:	Su	bject Na		epartn			l'Ingli		<u>ig</u> Ту/	L	Τ/	<b>P/ R</b>	С
BAR18IL1	1 GEOLOGY AND BUILDING MATERIALS LAB Lb/ S.I ETL ETL				S.Lr		_						
	_												
	Pre	erequisit	e: None						Lb	0	0/0	2/0	1
L : Lecture T :	Tutoria	ul SLr:	Supervis	ed Learr	ning P:	Project	R : Res	earch C	: Credits				
T/L/ETL : The	ory/Lat	o/Embed	ded Theor	ry and L	ab								
OBJECTIVE	:												
• Learn	to appr	eciate fie	eld conditi	ion in re	lation to	enginee	ering pro	ojects/pi	oblems a	and u	ndersta	nd the pro	oblems.
COURSE OU	тсом	MES (COs) : (3-5) At the end of the course, the student will be able to: Determine engineering properties of soils											
CO1		Determiı	ne enginee	ering pro	operties	of soils							
CO2		Measure strike and dip of the bedding planes Interpret geological Maps											
CO3		Interpret	geologica	al Maps									
CO4		Test on l	Physical F	Propertie	s of Soi	1							
Mapping of C	ourse (	Dutcome	con Physical Properties of Soilcomes with Program Outcomes (POs)O2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO1										
COs/POs	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	PO	10	PO11	PO12
CO1	Н					Μ	Μ						
CO2	Η					Μ	Μ						
C03	Η					Μ	Μ						
C04	Н					Μ	Μ						
COs / PSOs	PS	501	PSC	02									
CO1	Н		Η										
CO2	Η		Η										
C03	Η		Н										
C04	Η		Н										
H/M/L indicat	tes Stre	ength of	Correlati	ion H-	High, N	M- Med	ium, L-Ì						
Category	viences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	kills				
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Subject	Subject Title :	Ty/Lb/ETL	L	Τ /	<b>P</b> / <b>R</b>	С
code:	GEOLOGY AND BUILDING			S.Lr		
	MATERIALS LAB	Lb	0		2/0	1
BAR18IL1				0/0		

#### **COURSE CONTENT:**

#### **ENGINEERING GEOLOGY**

- 1. Study of Geological map and section of local area
- 2. Study the various properties of igneous rocks, sedimentary and metamorphic through rocks samples.
- 3. Study the various properties of different minerals and mineral ores through samples.
- 4. Study the various types of folds and faults.
- 5. Physical properties of minerals such as, hardness, colour, streak, etc.
- 6. Numerical Problems related to Dip and Strike
- 7. Study of different geological features through models
- 8. Field visit

#### **BUILDING MATERIALS**

1. Assessment of physical properties of bricks such as absorption, shape and size, structure, soundness,

Hardness, presence of soluble salts.

- 2. Hardness, impact and water absorption test etc for stones
- 3. Study on different types of bonds for bricks and stones
- 4. Study on defects in timber

Total No. of Hours: 30



Subject Code		ubject Na		cparti	nent o		Lingi		Ty/	L	T/S.Lr	<b>P/ R</b>	С
Subject Code		ENGINEI		URVEN	v				Lb/	L	I / 5.LI	1/ K	C
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DCE10004									L				
	P	Prerequisit	e: None						Ty	3	1/0	0/0	4
L : Lecture T :		<b>A</b>		ed Lean	ning P·	Project	R · Res	earch C	-		1/0	0/0	-
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T/L/ETL : The	: Theory/Lab/Embedded Theory and Lab <b>IVE :</b>												
OBJECTIVE													
• To int	roduce	e the princ	iples of v	arious s	urveying	g method	ls and ap	oplicatio	ons to (	Civil	Engineeri	ng projeo	ets
-	<b>E OUTCOMES (COs) : (3-5)</b> At the end of the course, the student will be able to: Understand the principles of basic survey instruments in civil engineering fields, concept of												
CO1			-	-			y instru	ments i	n civi	l eng	ineering	fields, c	oncept of
		contourin	-	-	-								
CO2		Understar		-			•	ng, Co	ntrol	surve	ying, Su	rvey adj	ustments,
			onomical surveying and Photogrammetric. erstand the concept Photogrammetry, Total station, Hydrographic survey and cartography.										
CO3			erstand the concept Photogrammetry, Total station, Hydrographic survey and cartography.								aphy.		
	ourse		tcomes with Program Outcomes (POs) PO2 PO3 PO4 PO5 PO6 PO7 PO8 P PO10 PO11 PO1										
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8		PO	10	PO11	PO12
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CO1	H	Μ		Μ		L			Η				
CO2	H	Μ		Μ		L			Η				
CO3	H	Μ		Μ		L			Η				
COs / PSOs	I	PSO1	PSC	02									
CO1	Η		Η										
CO2	Η		Η										
CO3	Η		Η										
H/M/L indica	tes Sti	rength of	Correlati	ion H-	High, N	M- Med	ium, L-	· · · · ·		T			
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code: BCE	FN	GINEERING SURVEY	Tv	3	1/0	R	1
18004		GINEERING SURVEI	1 y	3	1/0	0/0	4

#### UNIT I TYPES OF SURVEY

Definition - principles - classification - survey instruments - ranging and chaining - reciprocal ranging - setting perpendiculars –errors - traversing. Prismatic compass - surveyor's compass - bearing - systems and conversions - local attraction – magnetic declination - dip - plane table instruments and accessories – merits and demerits - methods - radiation - intersection - resection.

#### UNIT II LEVELLING AND APPLICATIONS

Level line - horizontal line - levels and staves - sprit level - bench marks - temporary and permanent adjustments - fly and check leveling - reciprocal leveling - longitudinal and cross sections. Contouring - methods - characteristics and uses of contours - plotting - calculation of areas and volumes- earth work volume.

#### UNIT III TACHEOMETRIC SURVEYING

Theodolite - vernier - description and uses - temporary and permanent adjustments of vernier transit – swinghorizontal angles - vertical angles – measurements of angles and distances Tacheometric systems - Tangential, stadia and subtense methods - Stadia systems - Horizontal and inclined sights - Vertical and normal staffing -Fixed and movable hairs - Stadia constants - Anallactic lens – Subtense bar.

#### UNIT IV CONTROL SURVEYING AND PHOTOGRAMMETRY

Working from whole to part - Horizontal and vertical control methods - Triangulation - Signals - Base line – Instruments and accessories - Corrections - Satellite station - Reduction to centre - Trignometric levelling – Single and reciprocal observations - Modern trends.

#### UNIT V SURVEY ADJUSTMENTS

Errors - Sources, precautions and corrections - Classification of errors - True and most probable values –weighted observations - Principle of least squares - Normal equation – Correlates.

#### TEXT BOOKS

- 1. Kanetkar T.P., "Surveying and Levelling", vols. I and II, United Book Corporation, Pune, 1994.
- 2. Punmia B.C., "Surveying", Vols. I and II, Laxmi Publications, Mumbai, 1999.
- 3. N.N basak., "Surveying and Levelling", Tata McGraw Hill, New Delhi, 2004.

#### REFERENCES

- 1. Clark D., Plane and Geodetic Surveying ", vols. I and II and C.B.S. Publishers, New Delhi, Sixth edition, 1991.
- 2. James M. Anderson and Edward M. Mikhail, "Introduction to Surveying", Tata McGraw Hill, New Delhi, 1995

### 12 HRS

#### **12 HRS**

**12 HRS** 

**12 HRS** 

**12 HRS** 

#### Total No of hours: 60

B.Tech – Civil Engineering - 2018 Regulation



Subject Code	: Su	bject Na	ame :						T y/		L	T/S.Lr	• P/ R	С
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BCE18005									ETL	,				
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OBJECTIVE														
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	_	owledge	about an	alyzing	the stru	ictural e	lements	by	energ	gy c	concep	ots and fin	nding str	esses and
deflect														
		nowledge about behavior of columns, critical loads and design of columnsMES (COs) : (3-5) At the end of the course, Students will have												
		<b>MES</b> (COs) : (3-5) At the end of the course, Students will have through knowledge in analysis of indeterminate beams and use of energy method for estimating												
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			and deflec											
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C03			beams and											
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CO2	H	H	H	H		M							M	
CO3	H	H	H	H		Μ							Μ	
COs / PSOs		501	PSC	)2										
CO1	H		H											
CO2	H		H											
C03	H		H					_						
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Subject	Subject Title :	Ty/Lb/ETL	L	Τ/	<b>P/ R</b>	С
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BCE18005	STRENGTH OF MATE	RIALS			0/0	
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		L.				

#### UNIT I **ENERGY PRINCIPLES**

Strain energy and strain energy density - Strain energy in tension, shear, flexure and torsion - Castigliano's & Engessor's energy theorems- Principle of Virtual Work- Application of energy theorems for computing deflection in Determinate structures - Maxwell's reciprocal theorem.

#### **DEFLECTIONS** UNIT II

Methods of Deflection Determination of Deflection curve – computation of slopes and deflections in Determinate Beams - Double Integration method – Macaulay's method – Area Moment method – Conjugate Beam method.

#### UNIT III **INDETERMINATE BEAMS**

Propped Cantilever and Fixed Beams - Fixed End Moments and Reactions for Standard cases of Loading -Continuous Beams - Theorem of Three Moments - Analysis of Continuous Beams - S.F. and B.M. Diagrams for Continuous Beams.

#### **UNIT IV COLUMNS**

Eccentrically Loaded Short Columns Middle Third Rule - Core of Section - Columns of Unsymmetrical Sections - Rankine - Gordon Formula Eccentrically Loaded Long Columns. Theories of Failure - Principal Stress, Principal Strain, Shear Stress, Strain Energy and Distortion Energy Theories.

#### **BENDING OF BEAMS** UNIT V

Bending of Beams of Symmetrical and Unsymmetrical Sections - Box sections and its importance - Winkler Bach Formula - Shear Center Simple problems

#### **Total No of Hours :60**

#### **TEXT BOOKS**

- 1. Rajput.R.K. "Strength of Materials", S.Chand and Co, New Delhi, 2007.
- 2. Bhavikatti. S., "Solid Mechanics", Vikas publishing house Pvt. Ltd, New Delhi, 2010.
- 3. R.S. Khurmi, "Engineering Mechanics of Solids", Prentice Hall of India, New Delhi, 1997.
- 4. S.S Ratan, "Strength of Materials", Tata McGraw Hill Publishing Company, New Delhi, 2008

#### REFERENCES

- Laudner T.J. and Archer R.R., " Mechanical of Solids in Introduction ",McGraw Hill International 1. Editions. New Delhi, 1994.
- 2. William A.Nash, "Theory and Problems of Strength of Material" Schaum's outline series, Mc Graw Hill International Editions, New Delhi, 1994

### **11 HRS**

**13 HRS** 

**13 HRS** 

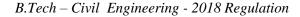
13HRS

**10HRS** 

#### B.Tech – Civil Engineering - 2018 Regulation



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Subject Code	: Su	bject Na	ame :					Ту	/Lb/E	L	T/S.Lr	<b>P/ R</b>	С					
			MECH	ANICS	OF FL	UIDS		TI										
BCE18006	Pre	erequisit	e: None					Ту	r	3	0/0	0/0	3					
L : Lecture T :	: Tutoria	al SLr	: Supervi	sed Lear	rning P	: Projec	t R : Re	search	C: Crea	lits								
T/L/ETL : The	eory/Lal	b/Embed	lded Theo	ory and l	Lab													
OBJECTIVE	:																	
• To kn	ow the i	mportan	ce, appli	cation ar	nd inter-	relations	ship of v	various	propert	ies of	f fluid.							
• To stu	dy theo	ries thos	e explain	the beh	avior an	d perfor	mance of	of fluid	when the	he flu	id is flow	ving thre	ough the					
pipe.																		
• To ur	nderstan	d the uti	lization o	f dimen	sional a	nalysis a	is a tool	in solv	ing prol	olem	s in the fi	eld of fl	uid					
mecha	anics.																	
COURSE OU																		
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CO2						•					e concepts	s of buo	yancy					
C03	Т	o have a	clear un	derstand	ing abou	ut fluid l	kinemati	cs and	dynami	cs								
C04	Т	o study	the basics	s of bou	ndary la	yer flow	and flo	w throu	ugh pipe	es								
C05	Т	o study	about var	ious mo	dels like	e distorte	ed mode	ls and	various	dime	nsionless	sionless numbers						
Mapping of C	Course (	Outcom	es with P	rogram	Outcor	nes (PO	s)											
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO	PO9	PO	10 PC	011	PO12					
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CO2	Η	Μ																
C03	Η												Η					
C04	Η				Μ													
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С

**MECHANICS OF FLUIDS** 3 0/0 0/0 3 Ty **BCE18006** UNIT I **DEFINITIONS AND FLUID PROPERTIES** 9 HRS

Definitions - Fluid and Fluid Mechanics - Dimensions and Units - Fluid properties - Viscosity, Compressibility, Surface tension and Capillarity, Continuum - concept of system and control volume.

#### **UNIT II** FLUID STATISTICS

Subject Title :

Subject

code:

Pascal's law and Hydrostatic equation - buoyancy -meta centric height - pressure measurement - gauges and manometers.

#### UNIT III **FLUID KINEMATICS**

Stream, streak and path lines - classification of flows - continuity equation - stream and potential functions --flow nets – velocity and acceleration measurement-Problems

#### **UNIT IV FLUID DYNAMICS**

Euler and Bernoulli's equations - application of Bernoulli's equation - discharge measurement -Hagen Poiseuille equation .

#### UNIT V FLOW THROUGH PIPES AND DIMENSIONAL ANALYSIS 9 HRS

Darcy Weisbach formula -Major and minor losses of flow in pipes – pipes in series and in parallel – Dimensional analysis - Buckingham  $\pi$  -theorem.

**Total No of Hours: 45** 

#### **TEXT BOOKS**

- 1. Dr.R. K. Bansal., "Fluid Mechanics and Hydraulic Machines", Laxmi Publications 2015.
- 2. Fox, Robert W. And McDonald, Alan T., "Introduction to Fluid Mechanics ", John Willey & sons

#### REFERENCES

- Streeter, Victor I. And Wylie, Benjamin E., "Fluid Mechanics", McGraw-Hill Ltd., 1998. 1.
- 2. Natarajan M.K., "Principles of Fluids Mechanics", Anuradha Agencies, Kumbakonam, 1995



# 9 HRS

# 9 HRS

### 9 HRS



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B.Tech – Civil Engineering - 2018 Regulation



#### Subject Title : Subject Tv/Lb/ETL Τ/ **P**/ L С code: S.Lr R BCE SENSORS AND INSTRUMENTATION Ty 3 **18I09** 3 0/0

#### UNIT I **INTRODUCTION**

Introduction to Smart Materials and Structures – Instrumented structures functions and response –Sensing systems Self processing consideration effectors. diagnosis Signal Actuation systems and

#### **UNIT II MEASURING TECHNIQUES**

Strain Measuring Techniques using Electrical strain gauges, Types - Resistance - Capacitance - Inductance -Wheatstone bridges – Pressure transducers – Load cells – Temperature Compensation – Strain Rosettes.

#### UNIT III **SENSORS**

Sensing Technology – Types of Sensors – Physical Measurement using Piezo Electric Strain measurement – Inductively Read Transducers – The LVOT – Fiber optic Techniques.Chemical and Bio-Chemical sensing in structural Assessment – Absorptive chemical sensors – Spectroscopes – Fibre Optic Chemical Sensing Systems and Distributed measurement.

#### UNIT IV **ACTUATORS**

Actuator Techniques – Actuator and actuator materials – Piezoelectric and Electrostrictive Material – Magnetostructure Material - Shape Memory Alloys - Electro orheological Fluids- Electro magnetic actuation -Role of actuators and Actuator Materials.

#### UNIT V SIGNAL PROCESSING AND CONTROL SYSTEMS

Data Acquisition and Processing – Signal Processing and Control for Smart Structures – Sensors as Geometrical Processors - Signal Processing - Control System - Linear and Non-Linear.

### **Total No of Hours: 45**

### **TEXT BOOKS**

1. Brain Culshaw – Smart Structure and Materials Artech House – Borton. London-1996.

### REFERENCES

1. L. S. Srinath – Experimental Stress Analysis – Tata McGraw-Hill, 1998.

2. J. W. Dally & W. F. Riley – Experimental Stress Analysis – Tata McGraw-Hill, 1998.



9 HRS

### 9 HRS

9 HRS

**9 HRS** 

9 HRS



Subject Code:		Subject I			Indi	an			T/L		L	T /	P	/	C
BHS18NC1		Constitu							ETL			S.L			
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L : Lecture T : Tur T/L/ETL : Theory					P : P1	roject R	R : Res	earch (	C: Cred	its					
<b>OBJECTIVES:</b>															
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CO3	To Know th							ective p	rincipl	es of s	tate	poli	су		
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CO1							Н	L	L	L	L				
CO2							Н	L	L	L	L				
CO2			+				H	L	L	М	L				
COs / PSOs	PSO1			PSO2											
CO1	L		]	L											
CO2	L		]	L											
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BHS18NC1	The Indian Constitution	2	0	0	0	
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UNIT 1 The History of the Making of Indian Constitution, Preamble and the Basic Structures	3Hrs
UNIT 2 Fundamental Rights and Duties, Directive Principles of State Policy	3Hrs
UNIT 3 Legislature, Executive and Judiciary	3Hrs
UNIT 4 Emergency Powers	3Hrs
UNIT 5 Special Provisions for Jammu and Kashmir, Nagaland and Other Regions, Amendments	3Hrs

#### **Total no Hrs: 15 Hrs**

#### **TEXT BOOKS:**

1. D D Basu, Introduction to the Constitution of India, 20th Edn., LexisnexisButterworths, 2012.

#### **REFERENCE BOOKS:**

- 1. Rajeev Bhargava (ed), Ethics and Politics of the Indian Constitution, Oxford University Press, New Delhi, 2008.
- 2. Granville Austin, The Indian Constitution: Cornerstone of a Nation, Oxford University Press, Oxford, 1966.
- 3. Zoya Hassan, E. Sridharan and R. Sudarshan (eds), India's Living Constitution: Ideas, Practices, Controversies, Permanent Black, New Delhi, 2002.
- 4. Subhash C. Kashyap, Our Constitution, National Book Trust, New Delhi, 2011.



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<ul> <li>To understand the Traditional Medicine, Traditional Production and Construction Technology</li> </ul>												
• To Know the History of Physics and Chemistry, Traditional Art and Architecture and Vastu Shashtra, Astronomy and Astrology												
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Physics and Chemistry, T         u Shashtra, Astronomy and Astrology         UTCOMES (COs): After studying this could react and the Pre- colonial and Colo Knowledge System         To understand the Pre- colonial and Colo Knowledge System         To understand the Origin of Mathematics Crafts and Trade in Ancient India         Course Outcomes with Program Outcomes         PO1       PO2       PO3       PO4       PO5       PO6       PO7         H       H       L       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M	2       traditional knowledge       F         Prerequisite: NIL       7         C: Tutorial SLr: Supervised Learning P: Project R         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Show the History of Physics and Chemistry, Traditional Art and Archited us Shashtra, Astronomy and Astrology       UTCOMES (COs) : After studying this course the student would be founderstand the Pre- colonial and Colonial Period, Indian Traditional Traditional Medicine, Traditional Production and Colony         To understand the Pre- colonial and Colonial Period, Indian Traditional Course (COs) : After studying this course the student would be founderstand the Pre- colonial and Colonial Period, Indian Traditional Course System         To understand the Origin of Mathematics, Aviation Technology in Acrafts and Trade in Ancient India         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO6       PO7       PO8       PO9       PO10       PO11         H       H       L       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M <t< td=""><td>Iteratitional knowledge       ETL     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Traditional Production and Construction mology       Construction and Astrology         UTCOMES (COs) : After studying this course the student would be able to a ble to ble to a ble to ble



BHS18NC2	The Indian traditional	2	0	0	0
	knowledge				

UNIT I	3Hrs
Historical Background: TKS During the Pre- colonial and Colonial Period, Indian Traditional Knowledge System	
UNIT II	3Hrs
Traditional Medicine, Traditional Production and Construction Technology	
UNIT III	3Hrs
History of Physics and Chemistry, Traditional Art and Architecture and Vastu Shashtra, Astror and Astrology	nomy
UNIT IV	3Hrs
Origin of Mathematics, Aviation Technology in Ancient India, Crafts and Trade in Ancient Ind	lia
UNIT V 3	3Hrs
TKS and the Contemporary World, TKS and the Indian Union, TKS and IT Revolution	

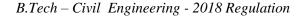
#### **Total no Hrs: 15 Hrs**

#### **TEXT BOOKS:**

- 1. Amit Jha (2009), Traditional knowledge system in india, 1st Edition, Delhi University (North Campus)
- 2. Dr.A.K.Ghosh (2011), Traditional Knowledge of Household Products



Subject Code	: Su	bject Na	ame :						T y/ Lb/	L	T/S.Lr	<b>P/ R</b>	C
		CO	NCRET	E AND	CONST	RUCT	ION		ETL				
BCE18ET1			TECHNOLOGY										
	Pr	erequisit	e: Buildin	g mater	ials				ETL	1	0/1	3/0	3
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CO2	Н		Н										
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Subject code:	Subject Title :	Ty/Lb	L	T/S.Lr	P/	С
BCE18ET1	CONCRETE AND CONSTRUCTION TECHNOLOGY	/ETL			R	
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#### UNIT I CONCRETE MAKING MATERIALS

Manufacture and Components of Portland Cement- Hydration Process- Types of Cement, Aggregates -Classification and Properties Admixtures.

#### UNIT II MIX DESIGN

Properties of Fresh Concrete- Workability, Segregation and Bleeding of Concrete - Factors influencing Mix Proportions - I.S and ACI Methods of Mix Design.

#### **PROPERTIES OF HARDENED CONCRETE UNIT III**

Strength - Creep and Shrinkage - Durability of Concrete - Chemical Attack - Different Types of FRC - Properties and Applications.

#### **UNIT IV** SUB STRUCTURE CONSTRUCTION

Piling techniques – Sheet piles – Under water construction of Diaphragm wall and basement – Driving diaphragm walls – Driving well and caisson – Sinking coffer dam – Shoring for deep cutting – Well points – Dewatering and stand by plant equipment for underground open excavation

#### UNIT V SUPER STRUCTURE AND CONSTRUCTION EQUIPMENTS

Construction sequences in cooling Towers, Bunkers, Silos and Chimney - Pre- stressed construction - In situ prestressing in high rise structures – Erecting light weight components on tall structures. Types of earth work equipment's - Tractors, Motor graders, Scrappers - Equipment for compaction - Batching and mixing and concreting.

Note: A Project report has to be submitted on any of the above topics which will be evaluated during the semester practical exams.

# Total No of Hours :

#### **TEXT BOOKS**

- Shetty. M.S., Concrete Technology, S.Chand and Co, Pune, 1984 1.
- 2. Arora S.P. And Bindra S.P., Building Construction, Planning Techniques and Method of Construction, Dhanpat Roy and Sons, New Delhi, 1997.
- Peurifoy, R.L., Ledbetter, W.D And Schexnayder, C., 'Consruction Plaaning, Equipment and 3. Methods' V Edition McGraw Hill, Singapore, 1995

#### REFERENCES

- Krishnasamy. K.T., Concrete Technology, Dhanapt Rai New Delhi 1985 1.
- 2. Neville, properties of concrete elbs, 1977.
- Sharma S.C., Building Construction, Khanna Publishers, New Delhi.1998 3.



# 9 HRS

8 HRS

### **10 HRS**

45

### 8 HRS

10 HRS



#### **Department of Civil Engineering** Subject Code: Subject Name : FLUID MECHANICS & Τ/ P/R C Ty/Lb/ L HYDRAULIC MACHINERY LAB **BCE18L03 ETL** S.Lr Prerequisite: None Lb 0 0/03/0 1 L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory/Lab/Embedded Theory and Lab **OBJECTIVE :** To learn the aim, working principle, components and function of hydraulic equipments. • To get hand-on experience in the operation of hydraulic machines. COURSE OUTCOMES (COs) : (3-5) **CO1** Measure theoretical discharge in pipes, Venturimeter, orificemeter and notches **CO2** Demonstrate and conduct experiment to find characteristic curves of various pumps **CO3** Demonstrate and conduct experiment to find characteristic curves of various turbines Mapping of Course Outcomes with Program Outcomes (POs) **COs/POs PO1 PO2** PO3 **PO4 PO5 PO8 PO6** PO **PO9 PO10** PO11 **PO12** 7 **CO1** Η Μ Μ Μ Μ **CO2** Η Μ Μ Μ Μ **CO3** Η М Μ Μ Μ COs/PSOs PSO1 PSO₂ **CO1** Η Η **CO2** Н Η **CO3** Н Η H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low Internships / Technical Skill Humanities and Social **Engineering Sciences** Program Electives Practical / Project Category **Open Electives Basic Sciences** Program Core Soft Skills Sciences



Subject	Subject Title :	Ty/Lb/ETL	L	T /	<b>P</b> /	С
code:	FLUID MECHANICS & HYDRAULIC			S.Lr	R	
BCE18L03	MACHINERY LAB					
		Lb	0	0/0	3/0	1

	6 HRS
<b>LOSSES IN PIPES</b> ation of major energy and minor losses in pipes	6 HRS
PUMPS rmance characteristics of	10 HRS
Rated speed centrifugal pump.	
	enturimeter. fice meter. LOSSES IN PIPES ation of major energy and minor losses in pipes PUMPS rmance characteristics of

#### UNIT IV TURBINES

Performance characteristics of Pelton wheel turbine and Francis turbine.

#### **Total No of Hours: 30 hrs**

8 HRS

#### **TEXT BOOKS**

- 1. Dr. R. K.Bansal., "Fluid Mechanics And Hydraulic Machines ", Lakshmi Publications (P) Ltd.New Delhi 2005.
- 2. Fox, Robert w. and Mcdonald, Alan T., "Introduction to Fluid Mechanics ",John Willey & Sons, New Jersey

#### REFERENCES

- 1. Streeter, Victor L. And Wylie, Benjamin e., "Fluid Mechanics", McGraw-Hill Ltd.New Delhi, 1998.
- 2. Natarajan M.K., "Principles of Fluids Mechanics ", Anuradha agencies, Vidayal karuppur, kumbakonam, 1995



: Sı	Subject Name : SURVEYING FIELD WORK							Ty/L b/ ETL			P/ R	С
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Tutori	al SLr :	Supervis	ed Learr	ning P:	Project	R : Res	earch C	: Credits	5		•	
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		nts related	d to find	ing heig	ht and d	istances	by tach	eometric	e, sing	gle pla	ine and do	ouble plane
S.	Setting ou	ut simple o	curve for	r constru	iction of	f road pu	irposes.					
	•					•		reoscope	for 3	3-D v	iewing, C	Co-ordinate
		•			•••		ion.					
Course	Outcome	es with Pr	ogram	Outcom	es (POs	5)						
<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	PO	10	PO11	PO12
Η		Μ			Μ						Μ	L
H		Μ			Μ						Μ	L
H		Μ			Μ						Μ	L
P	SO1	PSO	02									
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tes Str	ength of	Correlati	ion H-	High, N	M- Med	ium, L-	Low	•				
Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
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Setting out simple curve for         Setting out of works for f         measurements by GPS and         Course Outcomes with Program         PO1       PO2         PO3       PO4         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         H       M         It       M         It       M         S       S         S       S         S       S         S       <t< td=""><td>Prerequisite: None         Tutorial       SLr : Supervised Learning P :         cory/Lab/Embedded Theory and Lab         :       in the students with the practical knowled         in the students with the practical knowled         Set         TCOMES (COs) : (3-5)       At the end of         Experiments related to finding heig         method.         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Setting out simple curve for construction of road purposes.         Setting out of works for foundation marking, use of stermeasurements by GPS and Traversing by Total station.         Course Outcomes with Program Outcomes (POS)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8         H       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M       M</td></td></td<> <td>b/ ETL         Prerequisite: None         Tutorial       SLr: Supervised Learning P: Project R: Research C: Credits sory/Lab/Embedded Theory and Lab         :       in the students with the practical knowledge on basic surveying methods face         TCOMES (COs) : (3-5)       At the end of the course, the student will be al         Experiments related to finding height and distances by tacheometric method.       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Setting out of works for foundation       M       M       .       .       .	b/ ETL       S.Lr         Prerequisite: None       Lb       0       0/0         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits sory/Lab/Embedded Theory and Lab	b/ ETL     S.Lr ETL       Prerequisite: None     Lb     0     0/0     3/0       Tutorial     SLr : Supervised Learning P : Project R : Research C: Credits sory/Lab/Embedded Theory and Lab     :     :     :       :     in the students with the practical knowledge on basic surveying methods for construction and rese     :     :     :       TCOMES (COs) : (3-5)     At the end of the course, the student will be able to:     :     :       Experiments related to finding height and distances by tacheometric, single plane and do method.     :     :       Setting out simple curve for construction of road purposes.     :     Setting out of works for foundation marking, use of stereoscope for 3-D viewing, C measurements by GPS and Traversing by Total station.       Course Outcomes with Program Outcomes (POs)     PO1     PO1     PO1     PO1       PO1     PO2     PO3     PO4     PO5     PO6     PO7     PO8     PO9     PO10     PO11       H     M     M     M     M     M     M       H     M     M     M     M     M       H     M     M     M     M     M       H     M     M     M     M     M       W     H     M     M     M     M       H     M     M



Subject	Subject Title :	Ty/Lb/ETL	L	T / S.Lr	<b>P/ R</b>	С
code: BCE18L04	SURVEYING FIELD WORK	Lb	0	0/0	3/0	1

UNIT I	CHAIN SURVEYING	4 HRS
Ranging – Chai	ning – Traverse	
UNIT II	COMPASS SURVEYING	4 HRS
Traverse		
UNIT III	PLANE TABLE SURVEYING	6 HRS
Triangulation to – Two-Point Pro	o find distance between inaccessible points with and without known scale – Three oblem.	e-Point Problem

UNIT IVLEVELLING8 HRSStudy of levels and leveling staff – Fly leveling using dumpy level – Fly leveling using tilting level – Check

#### UNIT V THEODOLITE

Study of Theodolite Measurement of angles by reiteration and repetition - Measurement of vertical angles

#### **Total No of Hours: 30**

8 HRS

#### **TEXT BOOKS**

leveling.

- 1. Punmia B.C., "Surveying ", Vols. III, Laxmi Publications, Mumbai, 1999 and I, II.
- 2. *N.N Basak, " Surveying and Levelling ", Tata McGraw Hill Publishing Company Limited New Delhi, 2004.*

#### REFERENCES

- 1. Clark D., "Plane and Geodetic Surveying ", Vols. II and C.B.S. Publishers, I and Distributors, New Delhi, Sixth Edition, 1991.
- 2. James M. Anderson and Edward M. Mikhail, "Introduction to Surveying ", McGraw Hill Book Company, New Delhi, 1995



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								ETL		S.Lr	R	
Р	Prerequisit	e: Buildin	g Drawi	ing Prac	tice			Lb	0	0/0	3/0	1
Tutor	ial SLr :	Supervis	ed Learr	ning P:	Project	R : R	esearc	ch C: Credi	ts			
eory/La	ab/Embed	ded Theor	ry and L	ab								
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	prepare th	e building	g plans s	satisfyin	g the pri	nciple	s of p	lanning an	d bye	elaws.		
	draw plan	, section	and elev	ation for	r various	s struct	ures					
	prepare de	etailed wo	orking di	rawings	of doors	s, wind	ows,	roof trusse	s and	l staircas	es	
Course	Outcome	es with Pr	rogram	Outcom	nes (POs	5)						
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Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	-Practical / Project	Internships / Technical Skill	Soft Skills				
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H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H	Tutorial       SLr : Supervised Learning       P : Project       R : Research C: Credits         story/Lab/Embedded Theory and Lab       :       To provide the student with an appreciation of the capabilities and limitation         TCOMES (COs) : (3-5)       prepare the building plans satisfying the principles of planning and byc         draw plan, section and elevation for various structures       prepare detailed working drawings of doors, windows, roof trusses and         course Outcomes with Program Outcomes (POs)       PO1       PO2       PO3       PO4       PO5       PO6       PO       PO8       PO9       P         H       H       H       M       I       M       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I <t< td=""><td>Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits         story/Lab/Embedded Theory and Lab       : To provide the student with an appreciation of the capabilities and limitations of the         TOOMES (COS) : (3 - 5)       prepare the building plans satisfying the principles of planning and byelaws.         draw plan, section and elevation for various structures       prepare detailed working drawings of doors, windows, roof trusses and staircas         Course Outcomes with Program Outcomes (POS)       PO1       PO2       PO3       PO4       PO5       PO6       PO       PO8       PO9       PO10         H       H       H       M       Image: Structure in the image in the 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Image: Section and elevation for various structures       Image: Section and elevation for various structures       PO9       PO10       PO11         H       H       H       M       Image: Section and elevation for various structures       Image: Section and elevation for various struct</td></t<>	Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits         story/Lab/Embedded Theory and Lab       : To provide the student with an appreciation of the capabilities and limitations of the         TOOMES (COS) : (3 - 5)       prepare the building plans satisfying the principles of planning and byelaws.         draw plan, section and elevation for various structures       prepare detailed working drawings of doors, windows, roof trusses and staircas         Course Outcomes with Program Outcomes (POS)       PO1       PO2       PO3       PO4       PO5       PO6       PO       PO8       PO9       PO10         H       H       H       M       Image: Structure in the image in 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Section and elevation for various structures       Image: Section and elevation for various structures       PO9       PO10       PO11         H       H       H       M       Image: Section and elevation for various structures       Image: Section and elevation for various struct



Subject	Subject Title :	Ty/Lb/ETL	L	T /	<b>P</b> /	С
code:				S.Lr	R	
	BASICS OF AUTOCADD					
BAR18IL2		Lb	0	0/0	3/0	1

#### List of Experiments:

- 1. Learn and use basic AutoCAD commands manage drawing using layers, colour and line types complete basic cad drawings, with borders, text and dimensions use and edit text and text styles Method of scales in various drawing understand and the use of blocks.
- 2. Development of line plan for residential building. one for single storied building
- 3. Development of line plan for residential building. one for two storied building
- 4. Submission drawing for residential building including its planning and with area and parking statements and all other details as per the norms and local bye-laws.
- 5. Industrial buildings with roof truss.
- 6. To draw the 3D view of residential building.

#### Total No of Hours: 30 hrs

#### **TEXT BOOKS**

- 1. Civil Engg. Drawing & House planning B.P.Verma, Khanna publishers, Delhi, 1990
- 2. Building drawing & detailing Dr. Balagopal & T.S.Prabhu, Spades publishers, Calicut, 1989.

#### REFERENCES

- 1. Building drawing Shah, Tata McGraw-Hill, New Delhi, 2000.
- 2. Building planning & drawing Dr. N.Kumaraswamy, A.Kameswara Rao, Charotar publishing house. Mumbai, 1997.
- 3. Shah, Kale and Patki, Building drawing, Tata McGraw-Hill New Delhi,,1998.



:	Subjec	t Name :	-			RAWIN	0	Ty/L	L	T/S.Lr	<b>P/ R</b>	С
	USING	G CIVIL	ENGIN	EERIN	G SOF	ГWARF	ES	b/				
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P	rerequisit	e: Buildin	ig Drawi	ing Pract	tice			Lb	0	0/0	0/2	1
Tutori	al SLr :	Supervis	ed Lear	ning P:	Project	R : Res	earch C	: Credits	5			
eory/La	ıb/Embed	ded Theo	ry and L	ab								
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ovide th	ne student	with an a	appreciat	tion of th	ne capab	oilities an	nd limit	ations of	the A	AutoCAD ]	program	n.
TCON	MES (CO	s):(3-5	)									
]	prepare th	ne buildin	g plans s	satisfyin	g the pri	inciples	of planr	ning and	byela	iws.		
	draw plan	, section	and elev	ration for	variou	s structu	res					
]	prepare d	etailed wo	orking di	rawings	of doors	s, windo	ws, root	f trusses	and s	taircases		
Course	Outcome	es with Pi	rogram	Outcom	es (POs	s)						
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Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
	P. 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B.Tech – Civil Engineering - 2018 Regulation



Subject	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
code:				S.Lr	R	
BCE18TS1	BUILDING DRAWING USING CIVIL ENGINEERING SOFTWARES	Lb	0	0/0	0/2	1

- 1. Submission drawing for residential building including its planning and with area and parking statements and all other details as per the norms and local bye-laws.
- 2. Industrial buildings with roof truss.
- 3. To draw the 3D view of residential building.



Subject		Subj	ect Nar	ne :					Ty/	L	Τ/	P/ 1	R C	
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		Prere	quisite:	None					ETL	1	0/0	3/0	1	
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to develo														
• To help s	tuder	nts be	aware o	of vario	us techr	iques of	f candid	ate recru	itment a	nd he	lp them	prepare C	CV's and	l
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B.Tech – Civil Engineering - 2018 Regulation

# BEN18SK1

Subject Title :

**BUILDING SOFTWARES** 

## UNIT I

Subject

code:

Creation of awareness of top companies / improving skill set matrix / Development of positive frame of mind / Creation of self-awareness.

## UNIT II

Group discussions / Do's and don'ts – handling group discussions / what evaluators look for interpersonal relationships / Preparation of Curriculum Vitae / Resume.

### UNIT III

Interview – awareness of facing questions – Do's and don'ts of personal interview / group interview, enabling students to prepare for different proce3dures such as HR interviews and Technical Interviews / self-introductions.

#### UNIT IV

Verbal aptitude, Reading comprehension / narration / presentation / Mock Interviews.

SOFT SKILLS – I CAREER & CONFIDENCE

#### UNIT V

Practical session on Group Discussion and written tests on vocabulary and reading comprehension

Practical component P : Include case studies / application scenarios

Research component R : Future trends / research areas / Comparative Analysis

**Total No of Hours: 30** 



Ty/Lb/ETL

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**P/ R** 

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## 6 HRS

# 6 HRS

## 6 HRS

## 6 HRS

6 HRS

С

1



# **V SEMESTER**



Subject Code:	: Sı	ibject Na	ame :						Ty/Lb/	L	T/S.Lr	<b>P</b> / <b>R</b>	С
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T/L/ETL : The	ory/La	b/Embed	ded Theor	ry and L	ab								
OBJECTIVE	:												
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CO2	H		H										
CO3	H		н										
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#### Dr.M.G.R. Educational and Research Institute (DEEMED TO BE UNIVERSITY) (An ISO Certified Institution) University with Graded Autonomy Status Maduravoyal , Chennai - 600 095

#### **Department of Civil Engineering**

Subject	Subject Title :	Ty/Lb/ETL	L	T/S.Lr	<b>P/ R</b>	С
code:	APPLIED HYDRAULIC ENGINEERING					
		Ту	3	1/0	0/0	4
BCE18007						

#### FLOW IN OPEN CHANNEL

#### UNIT I INTRODUCTION

Open channel flow - types and regime of flow - velocity distribution in open channel - specific energy - critical flow and its computation.

#### UNIT II UNIFORM AND RAPIDLY VARIED FLOW

Uniform flow - velocity measurement - manning's and Chezy's formula - determination of roughness coefficients - most economical sections- Rectangular, Circular and Trapezoidal channel sections .Hydraulic jump - types - energy dissipation – surges

#### HYDRAULIC MACHINES

#### UNIT III ROTODYNAMIC PUMPS

Introduction – classification – Rotodynamic pumps: centrifugal pumps – work done – losses - specific speed - minimum speed to start the pump- multistage pumps- parallel and series.

#### UNIT IVPOSITIVE DISPLACEMENT PUMPS12 HRS

Positive displacement pumps - reciprocating pump -work done- slip - air vessels(theory only)

#### UNIT V TURBINES

Classification – Pelton wheel turbine –work done-Francis turbine –work done- draft tube –Kaplan turbine –work done.

#### **TEXT BOOKS**

1. Subramanian k., "Flow in open channels", Tata McGraw Hill Publishing Company, New Delhi, 1994

2. Dr. R.K.Bansal., "Fluid Mechanics and Hydraulic Machines", Lakshmi Publications (p) ltd., Pune, 2015.

3. Kumar K.L., "Engineering Fluid Mechanics", Eurasia publishing house (p) ltd. New Delhi, (7th edition), 1995.

#### REFERENCES

1. Ven Te Chow, "Open-channel hydraulics ", McGraw Hill Co., 1996 - , New York.

2. Ramamirtham S., "Fluid mechanics, Hydraulics and Fluid Machines ", Dhanpat Rai

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**12 HRS** 

## 14 HRS

#### **Total No of Hours: 60**

8 HRS

**14 HRS** 



Subject Code BME18I01		Subject Na COMPOS		FERIAI	LS				Ty/L b/ ETL	L	T / S.Lr	P/ R	С
	I	Prerequisit	e: None						Ту	3	0/0	0/0	3
L : Lecture T :	Tuto	rial SLr :	Supervise	ed Leari	ning P:	Project	R : Res	earch C	: Credits	5			
T/L/ETL : The	eory/L	.ab/Embed	ded Theor	y and L	ab								
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CO1	Μ	Μ		H			H		H				Μ
CO2	Μ	Μ	Μ	H					H				Μ
CO3	Μ	Μ	Μ	H			H		Η				Μ
COs / PSOs		PSO1	PSC	02									
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CO3	L		Н										
H/M/L indica	tes St	rength of	Correlati	on H-	High, N	M- Med	ium, L-			1			T
Category	Basic Sciences	-Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
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**TEXT BOOKS** 

P.K.Mallick, (2006) "Fiber-Reinforced Composites", Monal Deklatr Inc., New York. B.D.Agrawal and L.J.Broutmam, (2006) "Analysis and Performance of Fiber Composites", John Wiley 2. and Sons.New York.

#### REFERENCES

- 1. Micael hyer, (1998) "Stress Analysis of Fiber- Reinforced Composite Materials", Tata McGraw Hill.
- 2. Ronald Gibson, (2007) "Principles of Composite Material Mechanics", Tata McGraw Hill.

BME18I01	COMPOSITE MATERIALS	Ту	3	0/0	0/0	3
				<u> </u>		<u> </u>

#### UNIT-I **INTRODUCTION**

Subject Title :

Limitations of Conventional Materials- Definition of Composite Materials- Types and Characteristics Applications.

#### UNIT-II **MATERIALS**

Subject

code:

Fibers- Materials- Fiber Reinforced Plastics- Thermo set Polymers- Coupling Agents, Fillers and Additives- Metal Matrix and Ceramics Composites.

#### **UNIT-III** MANUFACTURING

Fundamentals- bag moulding- compression moulding pultrusion- filament winding- other manufacturing processquality inspection and non-destructive testing.

#### MECHANICS AND PERFORMANCE **UNIT-IV**

Introduction to Micro-mechanics- Unidirectional Lamina-Laminates- Inter laminar Stress- Statics Mechanical Properties- Fatigue Properties- Impact Properties- Environmental Effects- Fracture Mechanics and Toughening mechanisms, Failure Modes

#### UNIT-V DESIGN

Failure Predictions- Design Considerations- Joint Design- Codes- Design Examples. Optimization of Laminated Composites- Application of FEM for Design.

## 9 HRS

## Total No. of Hrs: 45

## Dr.M.G.R. Educational and Research Institute (DEEMED TO BE UNIVERSITY) (An ISO Certified Institution) risity with Graded Autonomy S Maduravoyal , Chennai - 600 095

**Department of Civil Engineering** 



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9 HRS

9 HRS

P/R

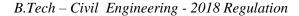
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9 HRS

## 9 HRS



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8045	Basic Sciences	Engineering Sciences	Humanities and Sciences	<ul> <li>Program Core</li> </ul>	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



## Maduravoyal , Chennai - 600 095 **Department of Civil Engineering**

Dr.M.G.R. Educational and Research Institute (DEEMED TO BE UNIVERSITY) (An ISO Certified Institution) ity with Graded Autonomy S

Subject	Subject Title :			Ty/Lb/ETL	L	Τ/	<b>P</b> /	С
code:	WATER SUPPLY	AND	SANITARY			S.Lr	R	
BCE18ET2	ENGINEERING							
				ETL	1	0/1	3/0	3

#### UNIT I PLANNING FOR WATER SUPPLY SYSTEMS

Scope of environmental engineering – role of environmental engineer – Public water supply systems – objectives - design period - population forecasting - water demand - sources of water - sources selection - water quality characterization – sources of wastewater –estimation of storm runoff.

#### UNIT II WATER TREATMENT

Screening - types of screening - plain sedimentation – sedimentation with coagulation – settling & flotation filtration - disinfection

#### UNIT III SEWAGE TREATMENT - PRIMARY TREATMENT

Objectives – unit operations & processes – principles, functions and design of screen, grit chambers and primary sedimentation tanks.

#### **UNIT IV : SEWAGE TREATMENT – SECONDARY TREATMENT**

Secondary treatment – activated sludge process and trickling filter; other treatment methods – stabilization ponds and septic tanks - advances in sewage treatment.

#### UNIT V: SEWAGE DISPOSAL AND SLUDGE MANAGEMENT

Methods – dilution – self purification of surface water bodies – oxygen sag curve – land disposal – sewage farming - deep well injection - soil dispersion system. Thickening - sludge digestion - biogas recovery - drying beds conditioning and dewatering - sludge disposal.

#### Note: A Project report has to be submitted on any of the above topics which will be evaluated during the semester practical exams.

## **TEXT BOOKS**

Garg, S.K., Environmental Engineering, Vols. I & II, Khanna Publishers, New Delhi, 1994 1.

2. C.S.Shah, Water Supply And Sanitation, Galgotia Publishing Company, New Delhi, 1994

#### REFERENCES

- Manual on Water Supply And Treatment, Ministry Of Urban Development, Government Of India, New 1. Delhi, 1999.
- 2. Manual on sewerage and sewage treatment, CPHEEO, Ministry Of Urban Development, Government Of India, New Delhi, 1993.
- 3. H.S.Peavy, D.R.Rowe and George Tchobanoglous, Environmental Engineering, Mcgraw-Hill Book Company, New Delhi, 1995.

## 9 HRS

9 HRS

## **9 HRS**

# 9 HRS

**Total No of Hours: 45** 

# 9 HRS



Subject Code BCE18L05	: 8	Subject Na ENV	ame : IRONMI	-			IG LAB		Ty/L b/ ETL	L	T / S.Lr	P/ R	C
	I	Prerequisit	e: None						Lb	0	0/0	3/0	1
L : Lecture T :	: Tuto	rial SLr :	Supervise	ed Learr	ning P:	Project	R : Res	earch C	: Credits	5	•	•	
T/L/ETL : The	eory/L	ab/Embed	ded Theor	y and L	ab								
OBJECTIVE	:												
• To im	ipart k	nowledge	on prepar	ation of	reagents	s, testing	g various	s water a	and wast	e wate	er quality	y param	eters.
COURSE OU	TCO	MES (CO	s):(3-5)	)									
CO1		To get ha	nd-on exp	erience	in the op	peration	of equip	oments l	ike pH r	neter,	TDS me	eter, turb	oidity
		meter, etc											
CO2		To analyz					•	Ũ					
CO3	T	The stude	nts compl	eting the	e course	will be	able to c	characte	rize was	tewate	er and co	onduct tr	eatability
		studies.											
Mapping of C	-					1							
COs/POs	POI		PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PO9	PO1		PO11	PO12
CO1	H	H	Μ		H		H	H	Μ			M	
CO2	H	Μ	Μ		H		H	H	Μ			M	
CO3	H	Μ	Μ		H		H	H	Μ		]	M	
COs / PSOs	_	PSO1	PSC	02									
CO1	H		Н										
CO2	H		Н										
CO3	Η		Н										
H/M/L indica	tes St	rength of	Correlati	on H-	High, N	M- Med	ium, L-			r	r		
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject code:	Subject Title : ENVIRONMENTAL ENGINEERING LAB	Ty/Lb/ETL	L	T/ S.Lr	<b>P/ R</b>	С
BCE18L05		Lb	0	0/0	3/0	1

#### LIST OF EXPERIMENTS

- a) Determination of pH.
   b) Determination of Turbidity.
- 2. Determination of Hardness.
- 3. Determination of Alkalinity.
- 4. Determination of Residual Chlorine.
- 5. Estimation of Chlorides.
- 6. Estimation of Ammonia Nitrogen.
- 7. Estimation of Sulphate.
- 8. Determination of optimum coagulant dose.
- 9. Determination of specific conductivity.
- 10. Estimation of available chlorine in Bleaching Powder.
- 11. Determination of dissolved Oxygen.
- 12. Determination of suspended settleable, volatile and fixed solids
- 13. B.O.D. Test.
- 14. C.O.D. Test.

#### Total No of Hours: 30

#### **REFERENCE BOOKS**

- 1. Trivedi and Goel Chemical and biological methods for water pollution studies. New Delhi, 2000.
- 2. A course Manual Water and wastewater analysis. National Environmental Engineering Research Institute. Nagpur publication.
- 3. Standard Methods for Examination of water and Waste water APHa, AWWA and WPCF, 1985 Edition.



F Tutor	ENVIRO STRUCTU Prerequisito ial SLr : ab/Embedo	J <b>RES DR</b> e: None			RAULIO	C		b/		S.Lr		
F Tutor ory/La	Prerequisito	e: None	AWIN	G								
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ory/La		Supervise						Lb	0	0/0	3/0	1
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	hand-on e	xperience	in draw	ving of a	environi	nental e	ngineeri	ng struc	cture	5		
	To draw p	olan eleva	tion and	section								
ourse	Outcome	nomes with Program Outcomes (POs)										
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO	10	PO11	PO12
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H							Н	H			Μ	
H							Н	H			Н	
I	PSO1	PSC	02									
Η		Н										
Η		Н										
Η		Н										
tes St	rength of	Correlati	on H-	High, N	M- Med	ium, L-	Low					
Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
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engineering structures         To draw plan elevation and section of structures         ourse Outcomes with Program Outcomes (POs)         P01       P02       P03       P04       P05       P06       P07       P08       P09         H       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I	TCOMES (COs) : (3-5)         hand-on experience in drawing of irrigation engineering structures         hand-on experience in drawing 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Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11         H

**HYDRAULIC** 

#### STRUCTURES DRAWING 0 **BCE18L06** Lb 0/0 3/0

AND

#### UNIT I WATER SUPPLY AND TREATMENT

Subject Title :

**ENVIRONMENTAL** 

Design & Drawing of flocculate, clarifier – Rapid sand filter – House service connection for water supply and drainage. 8 HRS

#### UNIT II **SEWAGE TREATMENT & DISPOSAL**

Design and Drawing of screen chamber - Grit channel - Primary clarifier - Activated sludge process - Aeration tank – Secondary clarifiers – Sludge digester – Sludge drying beds – Waste stabilization ponds - Septic tanks and disposal arrangements - Manholes.

#### UNIT III IMPOUNDING STRUCTURES

Gravity dam, Tank Surplus Weir, Tank Sluice with tower road – Drawing showing plan, Elevation, half section including foundation details.

#### UNIT IV CANAL TRANSMISSION STRUCTURES

Aqueducts – Syphon Aqueducts – Super passage – Canal siphon – Canal Drops- Drawing Showing plan, elevation and foundation details.

#### UNIT V **CANAL REGULATION STRUCTURES**

Canal head works- Canal Regulator – Canal escape- Proportional Distributors – Drawing showing detailed plan, elevation and foundation.

## **TEXT BOOKS**

Subject

code:

- *Modi*, *P.N.*, *"Environmental Engineering I & II"*, *Standard Book House*, *Delhi 6* 1.
- 2. SathyanarayanaMurthy "Irrigation Design and Drawing" Published by Mrs L.Banumathi, Tuni east Godavari District.A.P. 1998.
- Sharma R.K. Irrigation Engineering and Hydraulic Structures Oxford and IBH Publishing co., New Delhi 3. 2002.

## REFERENCES

- Peary, H.S., ROWE, D.R., Tchobanoglous, G., "Environmental Engineering", McGrawHill Book 1. Co., New Delhi, 1995.
- 2. Metcalf & Eddy, "Wastewater Engineering (Treatment and Reuse)", 4thedition, Tata McGraw-Hill, New Delhi, 2003.
- Garg S.K., "Irrigation Environmental Engineering and design StructuresI", Khanna Publishers, New 3. Delhi, 17th Reprint, 2003.
- Manual on Water Supply and Treatment, CPHEEO, Government of India, New Delhi, 1999 4.
- 5. Manual on Sewerage and Sewage Treatment, CPHEEO, Government of India, New Delhi.

**Total No of Hours: 30** 

#### Dr.M.G.R. Educational and Research Institute BE UNIVERSITY) (DEEMED TO (An ISO Certified Institution) rsity with Graded Autonomy S Maduravoyal , Chennai - 600 095



Ty/Lb/ETL

L **T**/

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Basic Sciences	<ul> <li>Engineering Sciences</li> </ul>	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
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Able to create the presentation for the department u         Fourse Outcomes with Program Outcomes (POS)         PO1       PO2       PO3       PO4       PO5       PO6       PO7         H       M       H       I       I       I       I         PSO1       PSO2       I       I       I       I         H       H       I       I       I       I       I         I Bio OS       Puice of the sective of the</td><td>$\begin{tabular}{ c c c c c c c } \hline BASIC COMPUTER SKILL FOR CIVIL ENGINEERS \\ \hline Prerequisite: NONE \\ \hline Tutorial SLr: Supervised Learning P: Project R: Research Corry/Lab/Embedded Theory and Lab \\ \hline TCOMES (COs) : (3-5) At the end of the course the students with ms word. \\ \hline TCOMES (COs) : (3-5) At the end of the course the students with ms word. \\ \hline Able to create the presentation for the department using Potential with excel \\ \hline Course Outcomes with Program Outcomes (POs) \\ \hline PO1 &amp; PO2 &amp; PO3 &amp; PO4 &amp; PO5 &amp; PO6 &amp; PO7 &amp; PO8 \\ \hline H &amp; M &amp; H &amp; I &amp; I &amp; I \\ \hline H &amp; M &amp; H &amp; I &amp; I &amp; I \\ \hline PSO1 &amp; PSO2 &amp; I &amp; I \\ \hline H &amp; M &amp; H &amp; I &amp; I &amp; I \\ \hline H &amp; H &amp; H &amp; I &amp; I \\ \hline H &amp; H &amp; H &amp; I &amp; I \\ \hline H &amp; H &amp; H &amp; I \\ \hline H &amp; H &amp; H &amp; I \\ \hline H &amp; I &amp; H \\ \hline H &amp; I &amp; I \\ \hline H \\ \hline H &amp; I \\ \hline H \\ \hline H &amp; I \\ \hline H \\ \hline$</td><td>BASIC COMPUTER SKILL FOR CIVIL ENGINEERS       b/ ETL         Prerequisite: NONE       Lb         Tutorial SLr : Supervised Learning P : Project R : Research C: Credits cory/Lab/Embedded Theory and Lab         : apart a knowledge on the basic computer skill         TCOMES (COs) : (3- 5) At the end of the course the students will be         Familiar with MS word.       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Able to create the presentation for the department using Power Point         Familiar with excel       Formula       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1         H       M       H       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I</td><td>BASIC COMPUTER SKILL FOR CIVIL ENGINEERS       b/ ETL       S.Lr         Prerequisite: NONE       Lb       0       0/0         Tutorial       S.Lr : Supervised Learning       P : Project       R : Research C : Credits         corry/Lab/Embedded       Theory and Lab      </td><td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td></t<>	BASIC COMPUTER SKILL FOR CIVIL         BASIC COMPUTER SKILL FOR CIVIL         ENGINEERS         Prerequisite: NONE         Tutorial SLr : Supervised Learning P : Project R : Response to the basic computer skill         TCOMES (COS) : (3-5) At the end of the course the sture of the course of the course the sture of the course of the course with MS word.         Able to create the presentation for the department u         Familiar with MS word.         Able to create the presentation for the department u         Fourse Outcomes with Program Outcomes (POS)         PO1       PO2       PO3       PO4       PO5       PO6       PO7         H       M       H       I       I       I       I         PSO1       PSO2       I       I       I       I         H       H       I       I       I       I       I         I Bio OS       Puice of the sective of the	$\begin{tabular}{ c c c c c c c } \hline BASIC COMPUTER SKILL FOR CIVIL ENGINEERS \\ \hline Prerequisite: NONE \\ \hline Tutorial SLr: Supervised Learning P: Project R: Research Corry/Lab/Embedded Theory and Lab \\ \hline TCOMES (COs) : (3-5) At the end of the course the students with ms word. \\ \hline TCOMES (COs) : (3-5) At the end of the course the students with ms word. \\ \hline Able to create the presentation for the department using Potential with excel \\ \hline Course Outcomes with Program Outcomes (POs) \\ \hline PO1 & PO2 & PO3 & PO4 & PO5 & PO6 & PO7 & PO8 \\ \hline H & M & H & I & I & I \\ \hline H & M & H & I & I & I \\ \hline PSO1 & PSO2 & I & I \\ \hline H & M & H & I & I & I \\ \hline H & H & H & I & I \\ \hline H & H & H & I & I \\ \hline H & H & H & I \\ \hline H & H & H & I \\ \hline H & I & H \\ \hline H & I & I \\ \hline H \\ \hline H & I \\ \hline H \\ \hline H & I \\ \hline H \\ \hline $	BASIC COMPUTER SKILL FOR CIVIL ENGINEERS       b/ ETL         Prerequisite: NONE       Lb         Tutorial SLr : Supervised Learning P : Project R : Research C: Credits cory/Lab/Embedded Theory and Lab         : apart a knowledge on the basic computer skill         TCOMES (COs) : (3- 5) At the end of the course the students will be         Familiar with MS word.       Able to create the presentation for the department using Power Poin Familiar with excel         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9         H       M       H       I       I       I       I       I         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9         H       M       H       I       I       I       I       I       I         BYO1       PSO1       PSO2       I       I       I       I       I       I         H       H       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I	BASIC COMPUTER SKILL FOR CIVIL ENGINEERS       b/ ETL         Prerequisite: NONE       Lb       0         Tutorial       SLr : Supervised Learning P : Project R : Research C : Credits         sory/Lab/Embedded Theory and Lab         :         part a knowledge on the basic computer skill         TCOMES (COs) : (3-5) At the end of the course the students will be         Familiar with MS word.       Able to create the presentation for the department using Power Point         Familiar with excel       Formula       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1         H       M       H       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I	BASIC COMPUTER SKILL FOR CIVIL ENGINEERS       b/ ETL       S.Lr         Prerequisite: NONE       Lb       0       0/0         Tutorial       S.Lr : Supervised Learning       P : Project       R : Research C : Credits         corry/Lab/Embedded       Theory and Lab	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$



Subject	Subject Title :	Ty/Lb/	L	T/ S.Lr	<b>P</b> / <b>R</b>	С
code:	BASIC COMPUTER SKILL FOR CIVIL	ETL				
BCS18IL7	ENGINEERS	Lb	0	0/0	3/0	1

#### **APPLICATION PACKAGES**

#### Word

1. To create an advertisement in Word.

2. To illustrate the concept of mail merging in word.

#### **Spread Sheet**

3. To create a spread sheet to analyse the marks of the students of a class and also to create appropriate charts.

#### **Power Point**

4. To create the presentation for the department using Power Point

**Total No of Hours: 30** 



Subject Code	: S	Subject Na	ame :	-	RVEY C	CAMP			Ty/Lb/	L	Τ/	<b>P/ R</b>	С
BCE18TS2									ETL		S.Lr		
	F	Prerequisit	e: Survey	field wo	ork				Lb	0	0/0	3/0	1
L : Lecture T :	Tutor	ial SLr :	Supervise	ed Learr	ning P:	Project	R : Res	earch	C: Credits	5			
T/L/ETL : The	ory/L	ab/Embed	ded Theor	y and L	ab								
OBJECTIVE	:												
• The st	udent	will go to	the outsid	le site s	o that th	ey will	realize tl	he prac	tical diffi	cultie	es in tak	ing surv	eys in field
COURSE OU	TCO	MES (CO	os) : ( 3- 5)	)The stu	dent wil	ll be abl	e to						
CO1		perform s	urvey as p	per the f	ield con	dition							
CO2		conduct L	LS and CS	by usin	g advan	ced equ	ipment						
CO3		prepare co	ontour ma	p for the	e given a	area							
Mapping of C	ourse	Outcome	es with Pr	ogram	Outcom	nes (POs	s)						
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO	10	PO11	PO12
CO1	Н	Н			Н	Н	Н	Н	H			Μ	М
CO2	Н	Н			Н	Η	Η	Н	H			Μ	М
CO3	Н	Н			Н	Η	Η	Н	H			Μ	М
COs / PSOs	I	PSO1	PSO	02									
CO1	Н		Н										
CO2	Н		Н										
CO3	H		H										
H/M/L indica	tes Sti	rength of	Correlati	on H-	High, N	M- Med	lium, L-	Low					
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
code:				S.Lr	R	
BCE18TS2	SURVEY CAMP					
		Lb	0	0/0	3/0	1

Three weeks survey camp using Theodolite, cross staff, leveling staff, tapes and Plane table

- (i) Triangulation
- (ii) Trilateration
- (iii) Star observation to determine azimuth
- (iv) Rectangulation

* Will be accommodated during preceding winter vacation

#### REFERENCES

- 1. Bannister A. and Raymond S., "Surveying", ELBS, Pune, Sixth Edition, 1992.
- 2. Heribert Kahmen and Wolfgang Faig, "Surveying", Walter de Gruyter, 1995.
- 3. Kanetkar T.P., "Surveying and Levelling", Vols. I and II, United Book Corporation, Pune, 1994.
- 4. Punmia B.C., "Surveying ", Vols. I, II and III, Laxmi Publications, New Delhi, 1999.
- 5. Clark D., "Plane and Geodetic Surveying", Vols. I and II, C.B.S. Publishers and Distributors, Delhi, sixth Edition, 1971.
- 6. James M. Anderson and Edward M. Mikhail, "Introduction to Surveying ", McGraw Hill Book Company, New Delhi, 1985.
- 7. Wolf P.R. "Elements of Photogrammetry", McGraw Hill Book Company, New Delhi, 1988



# **VI SEMESTER**



Subject Code	: S	ubject Na	ame :	-	rillent		8	8	Ty/Lb/	L	Τ/	<b>P</b> /	С
BCE18008	S	TRUCTU	URAL AN	ALYS	IS				ETL		S.Lr	R	
	Р	rerequisit	e: Streng	th of ma	terials				Ту	3	1/0	0/0	4
L : Lecture T :	Tutor	ial SLr :	Supervis	ed Lear	ning P:	Project	R : Res	earch C	: Credits			I	
T/L/ETL : The	eory/La	ab/Embed	ded Theor	ry and L	ab								
OBJECTIVE	:												
• This c	ourse i	ntroduces	students	to the cla	assical m	nethods (	of struct	ural ana	lysis, i.e.,	meth	ods for	calculat	ing forces
and d	lisplace	ements in	n structur	es due	to give	n loads	and in	mposed	deformation	tions	. Both	determ	inate and
indete	rminat	e structure	es are cov	ered.									
COURSE OU	TCON	MES (CO	os) : ( 3- 5	)									
CO1		analysis c	of suspens	ion brid	ges and	arches							
CO2		will be co	onversant	with cla	ssical m	ethods o	of analys	is.					
CO3		analyse st	tructures b	oy plasti	c theory								
Mapping of C	Course	Outcome	tcomes with Program Outcomes (POs)										
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO	010	PO11	PO12
CO1	Η	H		Н			M	M				Μ	Μ
CO2	Η	H		Н			M	M				Μ	Μ
C03	Η	H		H			M	M				Μ	М
COs / PSOs	P	PSO1	PS	02									
CO1	Η		H										
CO2	Η		H										
C03	Η		Н										
H/M/L indica	tes Str	rength of	Correlati	ion H·	• High, I	M- Med	ium, L-			_			
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	<ul> <li>Program Core</li> </ul>	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
				N									



Subject code:	Subject Title :	Ty/Lb/ETL	L	Τ/	<b>P</b> /	С
				S.Lr	R	
BCE18008	STRUCTURAL ANALYSIS	Ту	3	1/0	0/0	4

#### UNIT I DEFLECTION OF DETERMINATE STRUCTURES

Principles of virtual work for deflections - Deflections of pin-jointed plane frames and rigid Plane Frames. Introduction to analysis of space trusses using method of tension coefficients – Beams curved in plan.

#### UNIT IISLOPE DEFLECTION AND MOMENT DISTRIBUTION METHOD12Hrs

Analysis of continuous Beams – cantilever beams - Continuous beams and rigid frames (with and without sway) - Symmetry and Asymmetry -Portal Frames. Stiffness and carry over factors –Balance – Distribution and carryover of moments - Analysis of continuous Beams - Plane rigid frames with and without sway – Structural frames

UNIT IIIMOVING LOADS AND INFLUENCE LINES (DETERMINATE)12 HrsInfluence lines for reactions in statically determinate structures – influence lines for member forces in pin jointed<br/>frames – Influence lines for shear force and bending moment in beam sections10 Hrs

#### UNIT IV ARCHES AND SUSPENSION BRIDGES

Arches structural forms – Examples of arch structures – Types of arches – Analysis of three hinged, two hinged and fixed arches, parabolic and circular arches – Settlement and temperature effects

Analysis of suspension bridges – Un stiffened cables and cables with three hinged stiffening girders – Influence lines for three hinged stiffening girders.

**UNIT V MATRIX METHOD FOR INDETERMINATE FRAMES AND PLASTIC ANALYSIS** 12 Hrs Equilibrium and compatibility - Determinate Vs indeterminate structures –Indeterminacy - primary structure -Compatibility conditions - Analysis of indeterminate pin-jointed plane frames, continuous beams. Element and global stiffness and flexibility matrices – Co-ordinate transformations – transformations of stiffness matrices -Analysis of Continuous Beams.

#### **TEXT BOOKS**

- 1. R.Vaidyanathan, P.Perumal, Comprehensive Structural Analysis Vol 1 and vol.2, Laxmi Publications, 2004
- 2. Bhavikatti S.S Structural Analysis Vol 1 and vol.2, Vikas Publishing House Pvt. Ltd New Delhi
- 3. S.Ramamrutham, R.Narayan, Theory of structures, Dhanpatrai publications, 1993

#### REFERENCES

- 1. Analysis of Structures: Strength and Behaviors T.S. Thandavamoorthy, oxford University press, New Delhi, 2005.
- 2. Matrix analysis of framed structures William Weaver, Jr & James M.Gere, CBS Publishers & Distributors, Delhi, 1995
- 3. Structural Analysis A Matrix Approach G.S.Pandit & S.P.Gupta, Tata McGraw-Hill, New Delhi, 1998
- 4. Manicka Selvam V.K., Elementary Matrix Analysis of Structures, Khanna Publishers Mumbai, 1990.
- 5. Coates R.C., Coutie M.G. and Kong F.K., Structural Analysis, ELBS and Nelson, Newjersey, 1990.

#### 12 Hrs

#### Total no of hours: 60

12 Hrs

12Hrs



S E	SOIL ME	CHANIC CRING				0		Ty/L b/ ETL	L	T / S.Lr	P/ R	C
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		•		Ū.	Project	R : Res	search C	: Credits	3			
•	ab/Embed	ded Theor	ry and L	.ab								
derstar ations.				strength	nature o	f variou	s soils a	nd their	settler	nent be	haviour	in
TCO												
				•	• •			•			a place	
	Able to de	esign shal	low, fou	indation	, deep fo	oundatio	n and re	taining s	structu	res.		
	and desig	n a suitabl	le found	lation	•	•	ity to in	vestigate	e the s	oil cond	lition an	d to select
Course	Outcome	es with Pr	ogram	Outcom	nes (PO	s)						
PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO1	.0	PO11	PO12
Н	Н		Н		H		Η					
Η	Н	Н	Н		Н		Η					
Η	Н	Н	Н		Н		Η					
I	PSO1	PSO	02									
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Н		Н										
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tes St	rength of	Correlati	on H	• High, I	M- Med	lium, L-	Low	_1	1			I
Basic Sciences	Engineering Sciences	Humanities and Social Sciences	<ul> <li>Program Core</li> </ul>	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
	E Tutor eory/L derstan ations. TCO Course PO1 H H H H H H H H	SOIL ME ENGINEE Prerequisita attorial SLr : cory/Lab/Embed derstand the basic attors. TCOMES (CO Students v Able to do Able to do At the end and desig Course Outcome PO1 PO2 H H H H H H H H H H H H H SO1 H H	SOIL MECHANIC         ENGINEERING         Prerequisite:       Engine         Tutorial       SLr : Supervise         cory/Lab/Embedded Theore         derstand the basic propertiations.         TCOMES (COs) : (3-5)         Students will have         Able to design shale         At the end of this color         and design a suitable         Course Outcomes with Private         PO1       PO2       PO3         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H         H       H       H	SOIL MECHANICS AND ENGINEERING         Prerequisite: Engineering G         Prerequisite: Engineering G         Tutorial       SLr : Supervised Learner         cory/Lab/Embedded Theory and L         derstand the basic properties and second         derstand the basic properties and second         At the basic properties and second         At the end of this course strand design a suitable found         Course Outcomes with Program         PO1       PO2       PO3       PO4         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H	SOIL MECHANICS AND FOUNIERGINEERING         Prerequisite:       Engineering Geology         Tutorial       SLr : Supervised Learning P :         cory/Lab/Embedded Theory and Lab         derstand the basic properties and strength ations.         TCOMES (COs) : (3-5)         Students will have the ability to sel         Able to design shallow, foundation         At the end of this course student act and design a suitable foundation         Course Outcomes with Program Outcom         PO1       PO2       PO3       PO4       PO5         H       H       H       H       H         H       H       H       I       I         PSO1       PSO2       I       I       I         H       H       H       I       I         H       H       H       I       I         I       I       H       I       I         I       H       H       I       I         I       H       H       I       I         I       I       I       I       I       I         I       I       I       I       I       I       I         I       H	SOIL MECHANICS AND FOUNDATION ENGINEERING         Prerequisite: Engineering Geology         Tutorial       SLr : Supervised Learning P : Project cory/Lab/Embedded Theory and Lab         derstand the basic properties and strength nature of ations.         TCOMES (COs) : (3-5)         Students will have the ability to select type         Able to design shallow, foundation, deep for At the end of this course student acquires the and design a suitable foundation         Course Outcomes with Program Outcomes (POS)         PO1       PO2       PO3       PO4       PO5       PO6         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H       H         H       H       H       H       H       H       H         H       H       H	SOL MECHANICS AND FOUNDATION ENGINEERING         Prerequisite: Engineering Geology         Tutorial       SLr : Supervised Learning P : Project R : Response to the second Lab         derstand the basic properties and strength nature of variou ations.         TCOMES (COs) : (3-5)         Students will have the ability to select type of foundation.         Able to design shallow, foundation, deep foundation         Able to design shallow, foundation         Able a suitable foundation         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7         H       H       H       H       H       H       H       H         PSO1       PSO2       Image: Course output to the select output	SOIL MECHANICS AND FOUNDATION ENGINEERING         Prerequisite:       Engineering Geology         Tutorial       SLr : Supervised Learning P : Project R : Research C cory/Lab/Embedded Theory and Lab         derstand the basic properties and strength nature of various soils a ations.         derstand the basic properties and strength nature of various soils a ations.         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Topology         TOCOMES (COS) : (3-5)       Students will have the ability to select type of foundation required for Able to design shallow, foundation, deep foundation and retaining such and design a suitable foundation         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9         H       H       H       H       H       H       H       H       H         PSO1       PSO2      </td> <td>SOIL MECHANICS AND FOUNDATION ENGINEERING       b/ ETL         Prerequisite: Engineering Geology       Ty       3         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits         cory/Lab/Embedded Theory and Lab         derstand the basic properties and strength nature of various soils and their settler ations.         TCOMES (COs) : (3-5)         Students will have the ability to select type of foundation required for the Able to design shallow, foundation, deep foundation and retaining structu At the end of this course student acquires the capacity to investigate the so and design a suitable foundation         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1         H       H       H       H       H       H       I       I       I         PSO1       PSO2      </td> <td>SOIL MECHANICS AND FOUNDATION ENGINEERING       b/ ETL       S.Lr         Prerequisite: Engineering Geology       Ty       3       1/0         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits sory/Lab/Embedded Theory and Lab      </td> <td>SOIL MECHANICS AND FOUNDATION ENGINEERING       b/ FTL       S.Lr       R         Prerequisite: Engineering Geology       Ty       3       1/0       0/0         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits       supervised Learning P: Project R : Research C: Credits         cory/Lab/Embedded Theory and Lab       derstand the basic properties and strength nature of various soils and their settlement behaviour ations.       supervised Learning P: Project R : Research C: Credits         TCOMES (COS) : (3-5)       Students will have the ability to select type of foundation required for the soil at a place       Able to design shallow, foundation, deep foundation and retaining structures.         At the end of this course student acquires the capacity to investigate the soil condition an and design a suitable foundation       PO1       PO1       PO1       PO1         Worker Outcomes with Program Outcomes (POs)       PO10       PO11       H       H       H       H       H         H       H       H       H       H       H       I       I       I       I         PSO1       PSO2       I       I       I       I       I       I       I         H       H       H       H       I       I       I       I       I       I         Source Outcomes with Program Outcomes</td>	SOIL MECHANICS AND FOUNDATION ENGINEERING       b/ ETL         Prerequisite: Engineering Geology       Ty         Tutorial SLr : Supervised Learning P : Project R : Research C: Credits bory/Lab/Embedded Theory and Lab       Topology         derstand the basic properties and strength nature of various soils and their ations.       Topology         TOCOMES (COS) : (3-5)       Students will have the ability to select type of foundation required for Able to design shallow, foundation, deep foundation and retaining such and design a suitable foundation         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9         H       H       H       H       H       H       H       H       H         PSO1       PSO2	SOIL MECHANICS AND FOUNDATION ENGINEERING       b/ ETL         Prerequisite: Engineering Geology       Ty       3         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits         cory/Lab/Embedded Theory and Lab         derstand the basic properties and strength nature of various soils and their settler ations.         TCOMES (COs) : (3-5)         Students will have the ability to select type of foundation required for the Able to design shallow, foundation, deep foundation and retaining structu At the end of this course student acquires the capacity to investigate the so and design a suitable foundation         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1         H       H       H       H       H       H       I       I       I         PSO1       PSO2	SOIL MECHANICS AND FOUNDATION ENGINEERING       b/ ETL       S.Lr         Prerequisite: Engineering Geology       Ty       3       1/0         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits sory/Lab/Embedded Theory and Lab	SOIL MECHANICS AND FOUNDATION ENGINEERING       b/ FTL       S.Lr       R         Prerequisite: Engineering Geology       Ty       3       1/0       0/0         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits       supervised Learning P: Project R : Research C: Credits         cory/Lab/Embedded Theory and Lab       derstand the basic properties and strength nature of various soils and their settlement behaviour ations.       supervised Learning P: Project R : Research C: Credits         TCOMES (COS) : (3-5)       Students will have the ability to select type of foundation required for the soil at a place       Able to design shallow, foundation, deep foundation and retaining structures.         At the end of this course student acquires the capacity to investigate the soil condition an and design a suitable foundation       PO1       PO1       PO1       PO1         Worker Outcomes with Program Outcomes (POs)       PO10       PO11       H       H       H       H       H         H       H       H       H       H       H       I       I       I       I         PSO1       PSO2       I       I       I       I       I       I       I         H       H       H       H       I       I       I       I       I       I         Source Outcomes with Program Outcomes



Subject	Subject Title :	Ty/Lb/ETL	L	T/	<b>P</b> /	С
code:				S.Lr	R	
	SOIL MECHANICS AND FOUNDATION					
BCE18009	ENGINEERING	Ту	3	1/0	0/0	4

#### UNIT I SOIL PROPERTIES AND COMPACTION OF SOIL

Nature of Soil – phase relation – Index properties – Soil structure – particle size distribution – Atterberg limits - classification for engineering purposes - BIS Classification system - Soil compaction - factors affecting compaction – laboratory and field compaction methods and monitoring – Clay Minerology.

SOIL MOISTURE - PERMEABILITY, STRESSES IN SOILS UNIT II Soil water - Various forms - Capillary rise - Suction - Effective stress concepts in soil - Total, neutral and effective stress distribution in soil – Permeability – Darcy's Law- Permeability measurement in the laboratory – Factors influencing permeability of soil – quick sand condition – Stress distribution in soil media – Boussinesq''s formula – stress due to line load, Circular and rectangular loaded area – approximate methods – Use of influence charts - Westerguard equation for point load.

#### UNIT III SHEAR STRENGTH AND SLOPE STABILITY

Shear strength of cohesive and cohesionless soil – Mohr, Coulomb failure theory –Measurement of shear strength - direct shear, Triaxial compression, UCC and Vane shear tests –Types of shear tests based on drainage and their applicability - Drained and undrained behaviour of clay and sand. Slope failure mechanisms - Modes - Infinite slopes – Finite slopes – Total and effective stress analysis – Stability analysis for purely cohesive and C-  $\Phi$  soils - Method of slices - Modified Bishop's method - Friction circle method - stability number.

#### **UNIT IV** SOIL **EXPLORATION**

Scope and objectives – Methods of exploration – averaging and boring – Wash boring and rotary drilling – Depth of boring – Spacing of bore hole – Sampling – Representative and undisturbed sampling – sampling techniques – Split spoon sampler, Thin tube sampler, Stationary piston sampler – Bore log report – Penetration tests (SPT and SCPT) – Geophysical methods.

#### **UNIT V** FOUNDATION – BEARING CAPACITY AND SETTLEMENT

Introduction - Types of foundation-Contact pressure distribution below footings - Location and depth of foundation - Selection of foundation based on soil condition - codal provisions - bearing capacity of shallow foundation on homogeneous deposits – Terzaghi"s formula and BIS formula – factors affecting bearing capacity – problems – Bearing Capacity from insitu tests (SPT, SCPT and plate load) – Allowable bearing pressure, Settlement - Components of settlement - Determination of settlement of foundations on granular and clay deposits - Allowable settlements - Codal provision.

#### **TEXT BOOKS:**

- Punmia P.C. Soil Mechanics and Foundations, Laximi Publications Pvt. Ltd, New Delhi, 1995. 1.
- Murthy, V.N.S, "Soil Mechanics and Foundation Engineering", UBS Publishers Distribution Ltd, New 2. Delhi, 1999.
- Purushothama Raj. P., "Soil Mechanics and Foundation Engineering", 2nd Edition, Pearson Education, 3. 2013.

#### **REFERENCES:**

- Bowles J.E, "Foundation analysis and design", McGraw-Hill, 1996. 1.
- 2. Arora K.R., "Soil mechanics and Foundation Engineering", Standard publishers and distributors, Newdelhi, 1997.

#### **Total No. of Hours:60**

## 12Hrs

12Hrs

12Hrs

12Hrs

12 Hrs



Subject (	Code:	Sul	bject Na	me :	Depu			Enginee		Ty/	L	Τ/	<b>P</b> /	С
BCE18E			•	SENSIN	G AND	GIS				Lb/ ETL		S.Lr	R	
		Pre	requisite	e: Enginee	ering Ge	ology, E	Engineer	ing surv	rey	ETL	1	0/1	3/0	3
L : Lectur	re T : T	utoria	l SLr:	Supervise	ed Learr	ing P:	Project	R : Res	earch C	: Credits	5	•	•	
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<ul> <li>Fund</li> <li>Aeri</li> <li>To d</li> <li>COURSE</li> <li>CO1</li> <li>CO2</li> <li>CO3</li> <li>CO4</li> <li>CO5</li> </ul>	oduce tl lament al phot evelop E OUT Apply problem Apply Apply Analyz resourc On Co	al know ograph the ab COM the com the	wledge of nic techni ility to s ES (CO ncepts of ncepts of ncepts of rer and w rmation on of the	f Electro I f satellite f DBMS i ector data	vsics of r age inter cific pro Magnetic and sens n GIS and mo	remote s rpretatio blem rig c energy sor paran odeling i	ensing. n techni ght from , spectru meters a in GIS,	ques ,to its ident um and s nd chara Apply C	create b tificatio spectral acteristic	basic und n till the signatur cs of diff	lerstance succes re curve ferent p disaste	sful soluti s in the pr latforms r manage	ractical	TTS and
Mapping							es (POs	.) .)						
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Categor	Rasic Sciences		Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
		3								~ 4				



Subject code:	Subject Title :	Ty/Lb/ ETL	L	T/ S.Lr	<b>P/ R</b>	С
BCE18ET3	REMOTE SENSING AND GIS	ETL	1	0/1	3/0	3

#### UNIT I **INTRODUCTION TO REMOTE SENSING**

Definition - components of remote sensing -, Energy sources and radiation principles, electromagnetic radiation (EMR) –EMR spectrum, active and passive remote sensing – platforms — visible, infra red (IR), near IR, middle IR, thermal IR and microwave – black body radiation - Planck's law – Stefan-Boltzman law.

**UNIT II EMR INTERACTION WITH ATMOSPHERE AND EARTH MATERIALS 9 HRS** Atmospheric characteristics, scattering of EMR - Raleigh, MIE, non-selective and Raman scattering - EMR interaction with water vapour and ozone – atmospheric windows – significance of atmospheric windows – EMR interaction with earth surface materials - radiance, irradiance, incident, reflected, absorbed and transmitted energy - reflectance - specular and diffuse reflection surface- spectral signature - spectral signature curves - EMR interaction with water, soil and earth surface

**OPTICAL AND MICROWAVE REMOTE SENSING SYSTEMS 9 HRS UNIT III** Satellites - classification - based on orbits - sun synchronous and geo synchronous - based on purpose - earth resource satellites, communication satellites, weather satellites, spy satellites, spectral, radiometric and spatial resolutions, Multispectral, thermal and hyper spectral sensing, along and across track scanners – description of sensors in land sat, spot, irs series – current satellites - radar – speckle - back scattering – side looking airborne radar - synthetic aperture radar - radiometer - geometrical characteristics

#### **UNIT IV GEOGRAPHIC INFORMATION SYSTEM**

GIS – components of GIS, data – spatial and non-spatial – maps – types of maps – projection – types of projection - raster and vector data structures - comparison of raster and vector data structure - GIS analysis using raster and vector data – DEM for Slope, Aspect, Flow direction, Flow pathways, Flow accumulation, Streams, Catchment area delineation, retrieval, reclassification, overlaying, buffering – data output.

UNIT V **IMAGE PROCESSING AND APPLICATIONS OF RS & GIS 9 HRS** Visual interpretation of satellite images – elements of interpretation - interpretation keys, Digital Image Processing - application of remote sensing and GIS – urban applications - integration of GIS and remote sensing – Remote sensing applications for watershed management, Rainfall runoff modeling, Irrigation management, Flood mapping, Drought assessment, Environment and ecology, urban analysis -resources information systems. Note: A Project report has to be submitted on any of the above topics which will be evaluated during the

semester practical exams. **Total No of Hours : 45** 

#### **TEXT BOOKS**

1. Anji Reddy, Remote Sensing and Geographical Information Systems, B.S. Publications, New Delhi, 2001

2. M.G. Srinivas (edited by), Remote Sensing Applications, Nervosa Publishing House, New Delhi, 2001.

#### REFERENCE

1. Lillesand T.M. And Kiefer R.W. Remote Sensing And Image Interpretation, John Wiley And Sons, Inc, New York, 1987.

2. Janza.F.J., Blue, H.M., Johnston, J.E., "Manual of Remote Sensing Vol.I American Society of Photogrammetry, Virginia, U.S.A, 1975.

3. Burrough P.A, Principle Of Gis For Land Resource Assessment, Oxford, 1990

#### 9 HRS

#### 9 HRS



	Subject Name :				Enginee		Ty/L	L	Τ/	<b>P</b> / <b>R</b>	C
CHANIC	SOIL MECHANIC	S LAB					b/		S.Lr		
							ETL				
e: None	Prerequisite: None						Lb	0	0/0	3/0	1
Supervis	Tutorial SLr : Supervis	ed Learr	ning P:	Project	R : Rese	earch C	Credits				
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ne princip	strate some of the princip	les taugl	nt during	the soil	mechar	nics cou	rse.				
	art knowledge of laborat	•	ndex tes	ting met	hods con	mmonly	used in	Soil	& found	ation eng	gineering.
	<b>TCOMES</b> (COs) : ( 3- 5										
	Knowledge to dete	mine In	dex prop	perties of	f the soil	ls like w	ater con	tent,	specific	gravity a	and
	Atterberg limits										
	Knowledge engine	ering pro	operties 1	like field	d density	, shear	strength	, per	neability	, compa	ction and
	consolidation										
	Test the soil to ass		•			d					
	ourse Outcomes with P						1				
PO3		PO4	PO5	PO6	PO7	<b>PO8</b>	PO9	PO	10	PO11	PO12
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PS		02									
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Correlat	tes Strength of Correlat	on H-	High, N	<b>1- Medi</b>	um, L-l	Low					
umanities and Social siences	Basic Sciences Engineering Sciences Humanities and Social Sciences	Program Core	Program Electives	Open Electives	-Practical / Project	Internships / Technical Skill	Soft Skills				
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#### **Department of Civil Engineering** Subject Subject Title : Ty/Lb/ETL **T**/ С L P/ code: S.Lr R SOIL MECHANICS LAB **BCE18L07** Lb 0 0/0 3/0 1

#### LIST OF EXPERIMENTS

- 1. Specific gravity of soil solids
- 2. Grain size distribution Sieve analysis Hydrometer analysis
- 3. Atterberg limits test Liquid limit, Plastic limit and shrinkage limit tests
- 4. Field density Test
- 5. Determination of moisture Density relationship using standard proctor.
- 6. Permeability determination (constant head and falling head methods)
- 7. Direct shear test on cohesion less soil
- 8. Unconfined compression test in cohesive soil
- 9. Tri axial compression test in cohesion less soil
- 10. Laboratory Vane shear test in cohesive soil
- 11. One dimensional Consolidation test (Determination of coefficient of consolidation only)

#### Total No of Hrs : 30 hrs

#### REFERENCES

- "Soil Engineering Laboratory Instruction Manual ", Published by the Engineering College Co-operative Society, Chennai, 1996.
- 2. Lambe T.W., "Soil Testing for Engineers", John Wiley and Sons, New York, 1990.
- 3. "I.S.Code of Practice (2720) Relevant Parts ", as amended from time to time..



de: Sı	ıbject N	ame :	Бсра	I thicht		Engine	cring	Ty/L	L	Τ/	<b>P/ R</b>	С
ST	RUCT	URAL AN	NALYS	IS AND	DESIG	N BAS	ED	b/		S.Lr		
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Pr	erequisit	e: None						Lb	0	0/0	3/0	1
T : Tutoria	al SLr	: Supervis	ed Lear	ning P:	Project	R : Res	earch C	: Credits	5			
Theory/La	b/Embed	ded Theo	ry and L	ab								
ncurrent H	The cour	se covers	the com				-		-	design,	visualiz	ation and
They wil	l have kr	owledge	of desig	ning a be	eam ,col	umn and	d slab as	s per cod	e			
They wil	l get an i	dea about	member	r selectio	on and o	ptimized	d memb	ers selec	tion c	onsistin	g of desi	gn.
able to vi	sualize a	and interpr	et data i	n softwa	are							
f Course	Outcom	es with P	rogram	Outcom	nes (POs	5)						
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO	10	PO11	PO12
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Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
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The course covers the complete analysis and design of RCC structures.         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The course covers the complete analysis and design of RCC structure DUTCOMES (COS) : (3-5)         They will have knowledge of designing a beam ,column and slab as per cod         They will get an idea about member selection and optimized members select able to visualize and interpret data in software         f Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9         H       H       H       H       H       H       Interpret       Interpret         s       PSO1       PSO2       Interpret       Interpret       Interpret       Interpret         H       H       H       H       Interpret       Interpret       Interpret         g       Interpret       Interpret       Interpret       Interpret       Interpret         H       H       H       Interpret	de:       Subject Name :       Ty/L       L         STRUCTURAL ANALYSIS AND DESIGN BASED       b/       ETL         ON CIVIL ENGINEERING SOFTWARE       ETL       b/         Prerequisite:       None       Lb       0         T : Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits       Theory/Lab/Embedded Theory and Lab         VE :       necurrent Engineering based user environment for model development, analysis, ification. The course covers the complete analysis and design of RCC structures.         DUTCOMES (COS) : (3-5)       They will have knowledge of designing a beam ,column and slab as per code         They will get an idea about member selection and optimized members selection c         able to visualize and interpret data in software         f Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1         H       H       H       H       H       H       I       I       I         s       PSO1       PSO2       I       I       I       I       I         H       H       H       H       I       I       I       I       I         g $igg$ $igg$ $igg$	de:       Subject Name :       Ty/L       L       T/         STRUCTURAL ANALYSIS AND DESIGN BASED       b/       L       S.Lr         ON CIVIL ENGINEERING SOFTWARE       ETL       b/       S.Lr         Prerequisite:       None       Lb       0       0/0         T : Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits       ETL       Freeroy/Lab/Embedded Theory and Lab         VE :       neurent Engineering based user environment for model development, analysis, design, ification. The course covers the complete analysis and design of RCC structures.       DUTCOMES (COs) : (3-5)         They will have knowledge of designing a beam ,column and slab as per code       They will get an idea about member selection and optimized members selection consisting able to visualize and interpret data in software         f Course Outcomes with Program Outcomes (POs)       PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       1         H       H       H       H       I       I       I       I       I         s       PSO1       PSO2       I       I       I       I       I       I         H       H       H       I       I       I       I       I       I       I	de:       Subject Name :       Ty/L       L       T /       P/R         STRUCTURAL ANALYSIS AND DESIGN BASED       b/       L       S.Lr       P/R         ON CIVIL ENGINEERING SOFTWARE       Lb       0       0/0       3/0         T : Tutorial       S.Lr : Supervised Learning P : Project R : Research C: Credits       ETL       0       0/0       3/0         T : Tutorial       S.Lr : Supervised Learning P : Project R : Research C: Credits       Encurrent Engineering based user environment for model development, analysis, design, visualizification. The course covers the complete analysis and design of RCC structures.       DUTCOMES (COS) : (3-5)         They will have knowledge of designing a beam ,column and slab as per code       They will get an idea about member selection and optimized members selection consisting of desi able to visualize and interpret data in software         f Course Outcomes with Program Outcomes (POS)       PO1       PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11         H       H       H       H       H       H       H       H       H       H       H         kater       FSO1       PSO2       Image: Figure Figu



	Department of Civil Engineering					
Subject	Subject Title :	Ty/Lb/ETL	L	Τ/	<b>P</b> /	С
code:		-		S.Lr	R	
	STRUCTURAL ANALYSIS AND DESIGN					
BCE18L08	BASED ON CIVIL ENGINEERING	Lb	0	0/0	3/0	1
	SOFTWARE					

#### LIST OF EXPERIMENTS

- 1. Introduction to staad pro Joint, Member/Element, Mesh Generation with flexible user-controlled numbering
- 2. Analyse and design any beam with any loading type and any kind of supports.
- 3. Analyse and design of any 2D Frame with any loading type for any load sets.
- 4. Portal frame with 5 load combinations- Analysis
- 5. Analysis of beam with moving load
- 6. Analyse steel structures with truss elements.

#### Total No of Hours: 30

#### **TEXT BOOK**

- 1. Structural design and drawing (Reinforced Concrete and Steel)-N. Krishna Raju, University publishers 3rd Edn, 2009.
- 2. Design Of Steel Structures- B.C.Punmia, Ashok Kumar Jain, Arun kumar Jain, Lakshmi Publications Pvt Ltd, 1999.

#### REFERENCE

- 1. Krishnamoorthy D- Structural Design and drawing Vol II CBS Publishers and distributors Delhi 1990.
- 2. Krishnamoorthy D- Structural Design and drawing Vol III (steel structures) CBS Publishers and Distributors Delhi 1990.



Subject Code	e: Su	bject N	ame :	-1			8	leering	Ty/	L	Τ/	<b>P</b> /	C
BEN18SK2			TATIVI			TIVE A	AND		LB/ ETL		S.Lr	R	
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<b>CO3</b>	criticis		nd interp	mat info	motio	from	anonha						
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CO2	Μ	Μ	М	Н	L	Η	L	Н	Η	Н	H	L	
CO3	Η	Н	Η	Н	Н	Η	Μ	Μ	Η	Н	H	H	
COs / PSOs	PS	01	PSO	02									
CO1	Н		Μ										
CO2	Н		Μ										
CO3	Η		Н										
H/M/L indica	ates St	rength	of Corr	elation	H- H	ligh, M	- Medi	um, L-Lo	ow	1			
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B.Tech – Civil Engineering - 2018 Regulation



Subject	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P/ R</b>	С
code:				S.Lr		
	SOFT SKILL – II (QUALITATIVE AND	ETL				
BEN18SK2	<b>QUANTITATIVE SKILLS</b> )		0	0/0	3/0	1
			Ŭ	0/0	0/0	

#### UNIT I LOGICAL REASONING I

Logical Statements – Arguments – Assumptions – Courses of Action.

#### UNIT II LOGICAL REASONING II

Logical conclusions – Deriving conclusions from passages – Theme detection.

#### UNIT III ARITHMETICAL REASONING I

Number system – H.C.F & L.C.M – Problem on ages – Percentage – Profit & Loss – Ratio & Proportion – Partnership.

#### UNIT IV ARITHMETICAL REASONING II

Time & Work – Time & Distance – Clocks – Permutations & Combinations – Heights & Distances – Odd man out and Series.

#### UNIT V DATA INTERPRETATION

Tabulation – Bar graphs – Pie graphs – Line graphs.

#### **REFERENCES:**

1. R.S.Agarwal, A modern approach to Logical Reasoning, S.Chand & Co., (2017).

2. R.S.Agarwal, A modern approach to Verbal and Non verbal Reasoning, S.Chand & Co., (2017).

3. R.S.Agarwal, Quantitative Aptitude for Competitive Examinations, S.Chand & Co., (2017).

4. A.K.Gupta, Logical and Analytical Reasoning, Ramesh Publishing House, (2014).

5. B.S.Sijwali, Indu sijwali, A new approach to Reasoning (Verbal and Non verbal), Arihant Publishers, (2014).



Subject Code		ıbject Na							Ty/	L	Τ/	<b>P</b> /	R C
BCE18L09			)JECT / 1			INING	- /		Lb/		S.Lı	•	
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OBJECTIVE	•			<i>j</i> unu 2									
		chnical s	kill and p	ractical	learning	in field	work						
COURSE OU													
CO1			vill posses		knowled	lge and	experier	nce in ci	vil con	structio	n field		
CO2	S	Student ca	an correla	te theore	etical kn	owledge	e with pr	actical	experie	ence			
CO3	S	Student w	vill be able	e to prep	are repo	rt based	on the e	experie	nce gai	ned			
Mapping of C	Course (	Outcome	s with Pr	ogram	Outcom	es (POs	5)						
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P 09	PO10		PO11	PO12
CO1	Н					Н		H	H	Μ		Н	Н
CO2	Н					Н		Η	Н	Μ		Н	Н
CO3	Н					Н		H	Н	Μ		Н	Н
COs / PSOs	P	501	PSC	)2									
CO1		Н	Н	[									
CO2		H	Н										
CO3		H	H										
H/M/L indica	tes Stre	ength of	Correlati	on H-	High, N	A- Med	ium, L-	Low					
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
code:				S.Lr	R	
	MINI PROJECT / INPLANT					
BCE18L09	TRAINING / INDUSTRIAL	Lb	0	0/0	3/0	1
	TRAINING					

#### **INDUSTRIAL TRAINING**

Soil Investigation

Construction-different types of foundation, Highways and Embankments

Prestressing-Bridges

Industrial Structures- steel-fabrication and erection

Specification for various works- measurement and Billing

#### **OFFICE TRAINING**

Architectural plan

Latest civil Engineering softwares based on design and analysis

Students have to visit at least one industry relevant to civil engineering as part of industrial training and spend a minimum of 15 days during semester break between VI and VII semester. A report of the same should be submitted at the beginning of the 7th semester and evaluation shall be conducted based on the report, presentation and viva-voce.



Subject Code	: Su	bject Na	ame :	-			8	ang	Ty/L	L	Τ/	<b>P</b> /	С
BCE18TS3	Α	DVANC	ED SUR	VEYIN	G FIEL	D WOF	RK		b/		S.Lr	R	
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	Pr	erequisit	e: Enginee	ering Su	rvey ,Sı	urveying	g field w	ork,	Lb	0	0/0	3/0	1
		rvey can											
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T/L/ETL : The	•	o/Embed	ded Theor	y and L	ab								
OBJECTIVE													
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					cing, use	e of stere	eoscope	for 3-D	viewing	, Co-c	ordinate	measure	ements by
GPS a	nd Trav	ersing by	y Total sta	ation.									
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COURSE OU CO1			s = (3 - 5) ge to carry		ngulatic	n							
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COs/POs	PO1	PO2	PO3	PO4	PO5	<b>PO6</b>	PO7	PO8	PO9	PO1	0 1	2011	PO12
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	tes Stre		correlati					Skill	Soft Skills				



#### **Department of Civil Engineering** Subject Subject Title : **T**/ С Ty/Lb/ETL L **P**/ code: S.Lr R ADVANCED SURVEYING FIELD BCE18TS3 WORK Lb 0 0/0 1

#### a. ADVANCED SURVEYING LAB

#### UNIT I TACHEOMETRY

Tangential system (using theodolite, leveling staff)

Stadia system (using theodolite, leveling staff)

Sub tense system (using theodolite, tape, cross staff, leveling staff)

#### UNIT II SETTING OUT WORKS

Foundation marking (using theodolite, tape, ranging rods)

Simple curve - right / left handed (using theodolite, tape, ranging rods)

Transition curve (using theodolite, tape, ranging rods)

#### UNIT III FIELD ASTRONOMY

Field observation for the calculation of azimuth (using theodolite, tape), Total

Station

#### b. Applications of Remote Sensing and GIS Lab

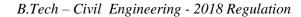
- 1. Introduction to basics of digital images and Data (Vector and Raster)
- 2. Interpretation of satellite images
- 3. Understanding the basic principles of Photogrammetry.
- 4. An introduction to image classification.
- 5. Interpreting RADAR images.
- 6. Extracting information from thermal remote sensing data.
- 7. Using GIS Software for plotting points, lines, polygons on maps.
- 8. Use of GIS in selection of Landfill site.

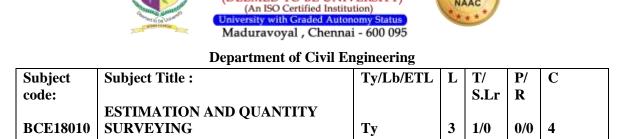
#### REFERENCES

- 1. Clark D, "Plane And Geodetic Surveying ", Vols. I and II, C.B.S. Publishers and Distributors, Delhi, Sixth Edition, 1971.
- 2. James M. Anderson and Edward M. Mikhail, "Introduction To Surveying", Mcgraw Hill Book Company, New Delhi, 1985.
- 3. Wolf P.R. " Elements Of Photogrammetry", Mcgraw Hill Book Company, New Delhi,



Subject Code	: S	ubject Na							Ty/	L	Τ/	<b>P</b> /	C
BCE18010		ESTIM	IATION .	AND Q	UANTI	TY SUI	RVEYIN	NG	Lb/ ETL		S.Lr	R	
DCEI0010	Р	rerequisit	e: Concre	te & cor	structio	n techno	ology W	ater	Ty	3	1/0	0/0	4
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OBJECTIVE	•			2									
• To stu	dy the	functiona	l plannin	g of buil	ldings as	s per sta	ndards;	To stud	y the est	imate	types a	nd terms	involved
													concepts
		d contrac											
COURSE OU													
At the end of t													
CO1		Prepare v	• •					e quanti	ty of wor	rks inv	volved.		
CO2			t analysis										
CO3		Prepare s	pecificati	ons for	various i	items of	construe	ction wo	orks				
CO4		Estimate		•				rks, wa	ter suppl	y and	sanitary	v works	
Mapping of C	Course	Outcome	es with Pr	rogram	Outcom	nes (POs	s)						
COs/POs	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PO9	POI	10	PO11	PO12
CO1	Η	Η		Н		Μ		Μ	Н			H	Н
CO2	Η	Η		Н		Μ		Μ	Н			H	Н
CO3	Η	Η		Н		Μ		Μ	Н			H	Н
CO4	Η	Η		Н		Μ		Μ	Н			H	Н
COs / PSOs		PSO1	PS	02									
CO1	Η		H										
CO2	Η		H										
CO3	H		H										
CO4	H		H										
H/M/L indica	tes Str	ength of	Correlati	ion H-	· High, I	M- Med	ium, L-			1			
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Category	S	Engineering Sciences	Humanities and Social Sciences		Program Electives	S	Practical / Project	Internships / Technical					
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Dr.M.G.R. Educational and Research Institute (DEEMED TO BE UNIVERSITY)

#### UNIT I **ESTIMATION**

Types of estimates- units of measurements-methods of estimates – advantages- estimation of load bearing and framed structures -estimate of quantities in residential building- calculation of quantities of brick work, RCC, PCC, white washing ,color washing and painting / varnishing – calculation of brick work and RCC works in arches - estimate of joineries for paneled and glazed doors ,windows, ventilators, handrails etc.

#### **UNIT II** ESTIMATE OF OTHER STRUCTURES

Estimating of septic tank, soak pit – Sanitary and water supply installations – Water supply pipe line – Sewer line - Tube well - Open well - Estimate of bituminous and cement concrete roads-estimation of retaining walls and culverts.

#### UNIT III SPECIFICATIONS AND TENDERS

Data -schedule of rates- analysis of rates-specifications-sources-detailed and general specifications - tenders- etender contracts- contracts types- preparation of tender notice and documents-arbitration and legal requirements

#### UNIT IV VALUATION

Necessity – basics of value engineering –capitalized value – depreciation and its methods – escalation _ value of building – calculation of standard rent – mortgage- lease.

#### UNIT V **REPORT PREPARATION AND CASH FLOW**

Principle of report preparation - report on estimate of residential building- commercial building -culvert - roads - water supply and sanitary installations - tube wells - open wells.

## TEXT BOOKS

- B.N.Dutta, Estimating And Costing In Civil Engineering –UBS publishers and distribution Pvt Ltd, 2003. 1.
- 2. Mr. B.Kanagasabapathy, M/S. Ehilalarasi Kanagasabapathy, Practical Valuation – Vol I, Thiruchirappalli, 1995.
- 3. Kohl, D.D and Kohli, R.C., "A Text Book of Estimating and Costing (Civil)", S.Chand & amp; CompanyLtd., 2004.
- Rangwala, "Estimating, Costing and Valuation", Charotar Publishing House Pvt Ltd., 2012. 4.

#### REFERENCES

- 1. G.S.Birdie, A Text Book On Estimating And Costing, Dhanpat Rai And Sons, New Delhi, 1995.
- 2. Mr. B.Kanagasabapathy, M/S. Ehilalarasi Kanagasabapathy, Fixation of Fair Rent, Thiruchirappalli, 1995.

## **12 HRS**

**12 HRS** 

## **12 HRS**

**12 HRS** 

## **12 HRS**

**Total No of Hours: 60** 



Subject Code	: 5	Subject Na	me:	Depu	rillent		Linginie	cring	Ty/L	L	Τ/	P/ R	С
	]	PRINCIP	LES OF N	MANA	GEMEN	T			b/		S.Lr		
BMG18003									ETL				
		Prerequisit							Ту	3	0/0	0/0	3
L : Lecture T			-		•	Project	R : Res	search C	C: Credits	3			
T/L/ETL : The		.ab/Embed	ded Theor	ry and L	ab								
OBJECTIVE	2:												
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COURSE OU	JTCO	MES (CO	s):(3-5	)									
CO1		students v	vill be abl	e to hav	e clear u	indersta	nding of	2					
		manageria	al function	ns like p	lanning,	organiz	zing, stat	ffing, le	ading &	contro	olling		
CO2													
		Have sam		Ũ			-		nagement	t			
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CO2						Μ		Μ		Μ	I	M	Η
CO3						Μ		Μ		Μ	ľ	М	Η
COs / PSOs		PSO1	PSO	02									
CO1	L		L										
CO2	L		L										
CO3	L		L										
H/M/L indica	ites St	rength of	Correlati	on H-	• High, I	M- Med	lium, L-	Low					
								Skill					
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical SI	Soft Skills	-Management Science			

Dr.M.G.R.

(DEEMED TO

	Subject	Subject Title :	Ty/Lb/ETL	L	Τ/	<b>P/ R</b>	С
	code:		•		S.Lr		
		PRINCIPLES OF MANAGEMENT	Ty	3		0/0	3
	BMG18003		- 5	-	0/0	0,0	5
	DiffG10000				0/0		
C	<b>BJECTIVES</b>	•					

- To increasing organizational effectiveness, To achieve optimum utilization of various resources.
- To have co-ordination between various department in the organization.

#### **UNIT-I**

Management: Importance – Definition – Nature and Scope of Management Process – Role and Functions of a Manager – Levels of Management – Development of Scientific Management and other Schools of thought and approaches.

#### **UNIT-II**

Planning: Nature - Importance - Forms - Types - Steps in Planning - Objectives - Policies - Procedures and Methods - Natures and Types of Policies - Decision - making - Process of Decision - making - Types of Decision.

#### **UNIT-III**

Organisation: Types of Organisations – Organisation Structure – Span of Control and Committees – Departmentalisation - Informal Organisation.

#### **UNIT-IV**

Authority – Delegation – Decentralisation – Difference between Authority and Power – Responsibility – Recruitment – Sources, Selection, Training – Direction – Nature and Purpose.

#### **UNIT-V**

Co-ordination - Need, Type and Techniques and requisites for excellent Co-ordination - Controlling -Meaning and Importance - Control Process.

#### **Total No of Hours :45**

#### **Reference Books**

1. C.B.Gupta, Management Theory & Practice -Sultan Chand & Sons - New Delhi.

2. L.M.Prasad, Principles & Practice of Management - Sultan Chand & Sons - New Delhi.

- 3. P.C. Tripathi & P.N Reddy, Principles of Managements Tata Mc.Graw Hill New Delhi.
- 4. Weihrich and Koontz, Management A Global Perspective.

5. N.Premavathy, Principles of Management - Sri Vishnu Publication - Chennai.

6. J.Jayasankar, Business Management - Margham Publication - Chennai.

## 9HRS

9HRS

# 9HRS

#### 9HRS

## 9HRS





Subject Code	e: Si	ıbject N	Name :						Ty/Lb/	L	Τ/	P/ R	C C
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L : Lecture T	: Tuto	rial SI	r : Supe	vised I	earnin	g P:Pi	roject F	R : Rese	arch C: C	Credit	S		
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B.Tech – Civil Engineering - 2018 Regulation

Subject	Subject Title :	Category	С	L	T/ S.Lr	<b>P/ R</b>	Ty/Lb/ETL
code:							
BCE18ET4	TRANSPORTATION	PCC	3	1	0/1	3/0	ETL
	ENGINEERING						

#### UNIT I :HIGHWAY PLANNING AND ALIGNMENT

Significance of highway planning –History of road development in India – Classification of highways – Locations and functions – Factors influencing highway alignment – Soil suitability analysis - Engineering surveys for alignment, objectives, conventional and modern methods.

#### **UNIT II: GEOMETRIC DESIGN OF HIGHWAYS**

Typical cross sections of Urban and Rural roads — Cross sectional elements - Sight distances – Horizontal curves, Super elevation, transition curves, widening at curves – Vertical curves - Gradients, Special consideration for hill roads - Hairpin bends – Lateral and vertical clearance at underpasses.

#### UNITIII: RAILWAYS PLANNING CONSTRUCTION AND MAINTENANCE 10 HRS

Elements of permanent way – Rails, Sleepers, Ballast, rail fixtures and fastenings, - Track Stress, coning of wheels, creep in rails, defects in rails - Geometric design of railways, gradient, super elevation, widening of gauge on curves- Points and Crossings. Tunneling Methods, drainage and ventilation –Calculation of Materials required for track laying - Construction and maintenance of tracks – Modern methods of construction & maintenance

#### **UNIT IV: AIRPORT PLANNING & DESIGN**

Airport planning, components of airports, airport site selection Runway design- orientation, geometric design and correction for gradients Terminal area, airport layout, airport buildings, passenger facilities, parking area and airport zoning

## UNIT V: HARBOUR ENGINEERING

Definition of terms - harbors, ports, docks, tides and waves. Harbors - requirements, classification - site investigation for locations, planning and layouts Terminal facilities - port buildings, warehouse, transit sheds, inter-modal transfer facilities, mooring accessories, navigational aids coastal structures piers, breakwaters, wharves, jetties, quays.

Note: A Project report has to be submitted on any of the above topics which will be evaluated during the semester practical exams.

#### **TEXT BOOKS**

- 1. Saxena Subhash C and Satyapal Arora, A Course In Railway Engineering, Dhanpat Rai And Sons, Delhi, 1998.
- 2. Khanna S K, Arora M G and Jain S S, Airport Planning And Design, Nemchand And Brothers, Roorkee, 1994.
- 3. Khanna K And Justo C E G, Highway Engineering, Khanna Publishers, Roorkee, 2001.
- 4. Kadiyali l r, Principles and Practice of Highway Engineering, Khanna technical Publications, Delhi
- 5. Dr K.P.Subramaniyam, Transportation Engineering, Scitech Publishers, Chennai 2003

#### REFERENCES

- 1. IRC standards, 2002
- 2. Bureau of Indian Standards (bis) publications on highway materials, 1998
- 3. Rangwala, Railway Engineering, Charotar Publishing House, Mumbai, 1995

## 9 HRS

# 8 HRS

#### Total No of Hours: 45



9 HRS

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BCE18L010	TRANSPORTATION	Lb	0			
	ENGINEERING LAB			0/0	3/0	1

#### LIST OF EXPERIMENTS

- 1. CBR Test of Given soil sample.
- 2. Grading Of aggregates.
- 3. Water Absorption Test on aggregates
- 4. Abrasion test on aggregates.
- 5. Impact Test On aggregates
- 6. Bitumen tests
- 7. Benklemann Beam apparatus.

Total No of Hours: 30



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OBJECTIVE	:												
• To in	npart h	ands on tr	aining on	estimati	on of va	arious ci	vil struc	tures ar	nd prepar	e val	uation r	reports	
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CO3		Student a	ble to con	nect the	actual s	cenario	in the co	onstruct	ion indus	stry			
Mapping of C	Course	Outcome	es with Pr	ogram	Outcom	es (POs							
COs/POs	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PO9	PO	10	PO11	PO12
CO1	Η	Η	Н	Η		Η		H	Η	Μ		Η	Н
CO2	Н	Н	Н	Н		Н		Н	Η	Μ		Η	Н
CO3	Η	Н	Η	Н		Н		Η	Η	Μ		Н	Н
COs / PSOs	P	SO1	PSO	02	PS	03	PS	<b>504</b>	PS				
									05				
CO1	H		H										
CO2	H		H										
CO3	H		Н					_					
H/M/L indica	tes Str	ength of	Correlati	on H-	High, N	M- Med	ium, L-I			1			[
							1	- <b>-</b>		1			
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	-Practical / Project	Internships / Technical Skill	Soft Skills				
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Ski	Soft Skills				



Subject	Subject Title :	Ty/Lb/ETL	L	Τ/	<b>P/ R</b>	С
code:		-		S.Lr		
DCE191.011	ESTIMATION AND EVALUATION	Lb	0	0.00	3/0	1
BCE18L011	PRACTICAL			0/0		1

#### LIST OF EXPERIMENTS:

- 1. Detailed Estimate [Duration and Cost] for a two storey building.
- 2. Detailed estimate for following projects:

[i] a culvert.

- [ii] stretch of road about 1 Km long including earthwork.
- [iii] Elevated water tanks.
- [iv] Manholes, Septic tanks.
- [v] Water supply Scheme and
- [vi] Drainage Scheme.
- 3. Estimate of Electrification Work for a Material Testing Laboratory.
- 4. Time Estimate by Network Analysis.
- 5. Estimation of Air Conditioning requirements for a Library.
- 6. Valuation reports for:
- [i] A hotel
- [ii] A Theatre
- [iii] An Educational Building

#### Total No of Hours : 30

#### **BOOKS/REFERENCES**

- 1. B.N.Dutta-Estimating and Costing in Civil Engineering, UPSPD
- 2. Delhi Schedule Rates, C.P.W.D.



Subject Code	: S	ubject Na	me:						Ty/L	L	Τ/	<b>P</b> / <b>R</b>	C
BCE18L012	P	<b>ROJEC</b>	T PHASE	E-I					b/		S.Lr		
									ETL				
		rerequisit							Lb	0	0/0	3/3	2
L : Lecture T :			•		•	Project	R : Res	earch C	C: Credits	3			
T/L/ETL : The	•	b/Embed	ded Theor	ry and L	ab								
OBJECTIVE													
			such a wa d stead as					compreh	nensive v	vork o	on the ch	osen toj	pic which
COURSE OU	TCON	AES (CO	os) : ( 3- 5	)									
CO1			a team and		•	-	•	arch ski	ills				
CO2		_	nnovative			-	-						
CO3			projects b				•	irement	S				
Mapping of C	Course	Outcome			1		<u>s)</u>						
COs/POs	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PO9	PO	lo I	PO11	PO12
CO1	Н	Н	Н	Η	Η	Η	Η	Н	Н	Η	I	H	Η
CO2	H	H	Η	Η	Η	Η	Η	Н	Η	Η		H	Η
CO3	H	H	H	H	H	Н	H	Η	H	H	I	I	H
COs / PSOs	D	SO1	PS										
CO1	H	501	H	02									
CO1 CO2	H		H										
CO2 CO3	H		H										
005	11												
H/M/L indica	tes Str	ength of	 Correlati	ion H-	 High, N	M- Med	ium. L-	Low					
indicu					8,1								
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject code:	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
BCE18L012		Lb	0	S.Lr 0/0	R 3/3	2
	PROJECT PHASE-I					

#### **OBJECTIVE**

• To guide the students such a way that the students carry out a comprehensive work on the chosen topic which will stand them in good stead as they face real life situations

The objective of project work is to enable the students to work in convenient groups of not more than four members in a group on a project involving theoretical and experimental studies related to civil engineering. Every project work shall have a guide who is a member of the faculty of the university.

Each student shall finally produce a comprehensive report covering background information, literature survey, problem statement, project work details and conclusions. This final report shall be typewritten form as specified in the guidelines.

The continuous assessment and semester evaluation may be carried out as specified in the guidelines to be issued from time to time.



Subject Code:	Su	bject Na	ame :						Ty/	L	T /	<b>P</b> /	C		
BHS18FLX	EC	DEICN	LANGU	ACE					Lb/ ETL		S.Lr	R			
DHS10FLA		requisit		AGE					Lb	0	0/0	3/0	1		
L : Lecture T :				ed Learr	ning P·	Project	R · Res	earch C		Ŭ	0/0	5/0			
T/L/ETL : The			•		0	roject	R . Res	earen e	. creatta	,					
OBJECTIVE		, 2000 0 0		<i>y</i> and <u></u>											
		the cultu	ral values	, practic	es. and	heritage	of the f	oreign c	ountry.	commu	nicate eff	ective	lv in a		
	•		nteract in	·		•		•	•				•		
COURSE OU	TCOM	ES (CO	s) : ( 3- 5)	)											
CO1	Achie	ve funct	ional prof	iciency	in listen	ing, spea	aking, re	eading, a	und writi	ng.					
<u> </u>		· · ·		(1			4 - 10 - 4		6 1						
CO2	Devel	op an 1r	nsight into	the nati	ure of la	nguage	itself, th	e proces	s of lang	guage a	nd cultur	e acqu	lisition.		
CO3	Decod	le, analv	ze, and in	terpret a	uthentic	texts of	f differe	nt genre	s.						
		,j													
Mapping of C	ourse (	rse Outcomes with Program Outcomes (POs)													
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	PO10	) PC	011	PO12		
CO1	L	L	L	L	L	H	L	Η	Μ	H	Η		L		
CO2	Μ	L	L	L	L	H	L	Н	Η	H	Η		L		
CO3	L	L	Μ	Μ	L	Η	Μ	Н	Μ	Η	Η		L		
COs / PSOs	PS	01	PSC	02											
CO1	Μ		Η												
CO2	Μ		L												
CO3	Η		Μ												
H/M/L indica	tes Stre	ngth of	Correlati	on H-	High, N	M- Med	ium, L-	Low		T					
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills						
			$\checkmark$												



# **VIII SEMESTER**



Subject Code BCE18011		Subject Na DISASTE		-			GEMEN	0	Ty/L b/ ETL	L	T / S.Lr	P/ R	C
	]	Prerequisit	e: NONE						Ту	3	1/0	0/0	4
L : Lecture T	: Tuto	rial SLr	Supervis	ed Lear	ning P:	Project	R : Res	search (	C: Credits	5			
T/L/ETL : The	eory/L	.ab/Embed	ded Theor	ry and L	ab								
OBJECTIVE													
To understan					specially	Remote	e Sensin	g and C	IS in Dis	saster	manager	ment.	
COURSE OU	JTCO										0.11		
CO1		At the end managem		ourse the	e student	will be	able to	underst	and the c	oncep	ts of dis	aster and	d disaster
CO2		Different	technique	es for an	alysis of	disaste	r pronen	less and	mitigati	on mea	asures		
CO3		The use of	f spatial s	cience i	n four fo	olds of d	lisaster n	nanage	ment				
Mapping of (	Course	e Outcome	es with Pr	ogram	Outcom	es (PO	s)						
COs/POs	POI	1 PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	0 I	PO11	PO12
CO1						М		М		Μ	1	М	Н
CO2						М		М		Μ	1	М	Η
CO3						М		М		М	1	М	Η
COs / PSOs		PSO1	PSO	D2									
CO1	L		L										
CO2	L		L										
CO3	L		L										
*****	~	1 2 -					<u> </u>						
H/M/L indicat	tes Str	rength of C	orrelation	H-Hi	igh, M-	Medium	n, L-Low		1		1		
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills	Management Science			
				$\checkmark$									



#### **Department of Civil Engineering** Subject Subject Title : Ty/Lb/ETL L **T**/ P/ С code: S.Lr R **DISASTER MITIGATION AND** BCE18011 MANAGEMENT 3 1/0 0/0 Тy 4

#### UNIT I DISASTER PRINCIPLES

Basic concepts and principles – Hydrological and geological disasters, characteristics crisis and consequences – Role of Government administration, University research organization and NGO''s – International disaster assistance – Sharing technology and technical expertise.

#### UNIT II LONG TERM MITIGATION MEASURES

Needs and approach towards prevention – Principles and components of mitigation Disaster legislation and policy – Insurance – Cost effective analysis – Utilisation of resources -Training – Education – Public awareness – Roles of media.

#### UNIT III SAFETY RATING OF STRUCTURES

Slope stability of Ghat roads -Structural safety of Dams, Bridges, Hospitals, Industrial structures, – Disaster resistant structures – Low cost housing for disaster prone areas – Cyclone shelter projects and their implications – Reconstruction after disasters: Issues of practices.

#### UNIT IV SPACE SCIENCE INPUT IN DISASTER MANAGEMENT

Remote sensing in Hazard evaluation – Zonation – Risk assessment – Damage assessment- Land use planning and regulation for sustainable development –Communication satellite applicationNetwork- Use of Internet – Warning system – Post disaster review – Case studies.

#### UNIT V EMERGENCY PLANNING USING SPATIAL AND NON-SPATIAL DATA 12 HRS

Information systems management – Spatial and non-spatial data bank creation – Operational emergency management – Vulnerability analysis of infrastructure and settlements – Predisaster and post disaster planning for relief operations – Potential of GIS application in development planning – Disaster management plan – Case studies.

#### **Total No of Hours: 60 HRS**

#### **TEXTBOOKS:**

- 1. Bell, F.G. Geological Hazards: Their assessment, avoidance and mitigation. E & FN SPON Routledge, London. 1999.
- 2. David Alexander, Natural Disasters, UCL Press, London, Research Press, New Delhi, 1993.

#### **REFERENCES**:

- 1. Nick Carter. W. Disaster Management A Disaster Manager''s Handbook. Asian Development Bank, Philippines. 1991.
- 2. Mitigating Natural Disasters, Phenomena, Effects and options, A Manual for policy makers and planners, United Nations. New York, 1991.
- 3. George G. Penelis and Andreas J. Kappos Earthquake Resistant concrete Structures. E & FN SPAN, London, 1997.

## 12 HRS

## **12 HRS**

**12 HRS** 

## 12 HRS



Subject Code	: S	ubject Na	me : ESIGN (	)F STF	FL STR	PICTI	RES		Ty/L b/	L	T / S.Lr	P/ R	C
BCE18012		Ľ							ETL		5.11		
2022002	P	rerequisit	e: Structur	ral analy	sis				Ty	3	0/0	0/0	3
L : Lecture T :		-		-		Project	R : Res	earch C	•	5			
T/L/ETL : The	eory/La	b/Embed	ded Theor	y and L	ab	-							
OBJECTI	VE:												
• To int	roduce	the stude	nt to mate	rial beha	aviour a	nd Load	and Re	sistance	Factor I	Desigr	n methoo	lology.	
• To des	sign an	d analyze	tension m	nembers	and con	npressio	n memb	ers.					
COURSE OU	TCON	AES (CO	(3-5)	)									
<u>CO1</u>			nts would		nowledg	e on the	design	of struct	ural stee	el men	nbers su	biected t	0
			ive, tensil		0		•					5	
CO2			to design							y gird	ers.		
CO3			and analy		-								
Mapping of C	Course	Outcome	es with Pr	ogram	Outcom	es (POs	3)						
COs/POs	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	PO1	10 1	PO11	PO12
CO1	Н	Н	Н	Н		Μ	Μ	Μ					
CO2	Н	Н	Н	Н		Μ	Μ	Μ					
CO3	Η	H	Н	Н		Μ	Μ	Μ					
COs / PSOs	P	SO1	PSC	02									
CO1	H		H						_				
CO2	H		Н										
CO3	Η		Н										
TT /5 // 1 1		(1 0						<u>r</u>					
H/M/L indica	ites Str	ength of	Correlati	on H-	High, N	VI- Med	ium, L-						
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	✓ Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
Approval			1	I	1	I	I	1		1			
* *													

Dr.M.G.R. Educational and Research Institute (DEEMED TO BE UNIVERSITY) (An ISO Certified Institution) rsity with Graded Autonomy S Maduravoyal , Chennai - 600 095

Subject code:	Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	P/ R	С
BCE18012	DESIGN OF STEEL STRUCTURES	Ту	3	0/0	0/0	3

#### UNIT I **INTRODUCTION**

Properties of steel – Structural steel sections – Limit State Design Concepts – Loads on Structures – Connections using rivets, welding, bolting – Design of bolted and welded joints – Eccentric connections - Efficiency of joints.

#### UNIT II **TENSION MEMBERS**

Types of sections – Net area – Net effective sections for angles and Tee in tension – Design of connections in tension members – Use of lug angles – Design of tension splice – Concept of shear lag

#### UNIT III **COMPRESSION MEMBERS**

Types of compression members - Theory of columns - Basis of current codal provision for compression member design - Slenderness ratio - Design of single section and compound section compression members - Design of laced and battened type columns – Design of column bases – Gusseted base

#### **UNIT IV BEAMS**

Design of laterally supported and unsupported beams – Built up beams – Beams subjected to uniaxial and biaxial bending – Design of plate girders - Intermediate and bearing stiffeners – Flange and web splices.

#### UNIT V **ROOF TRUSSES AND INDUSTRIAL STRUCTURES**

Roof trusses – Roof and side coverings – Design of purlin and elements of truss; end bearing – Design of gantry girder.

#### **TEXTBOOKS:**

1. Gambhir. M.L., "Fundamentals of Structural Steel Design", McGraw Hill Education India Pvt. Ltd., 2013

2. Shiyekar. M.R., "Limit State Design in Structural Steel", Prentice Hall of India Pvt. Ltd, Learning Pvt. Ltd., 2 nd Edition, 2013.

3. Subramanian.N, "Design of Steel Structures", Oxford University Press, New Delhi, 2013. **REFERENCES:** 

1. Narayanan.R.et.al. "Teaching Resource on Structural Steel Design", INSDAG, Ministry of Steel Publications,

2002

2. Duggal. S.K, "Limit State Design of Steel Structures", Tata McGraw Hill Publishing Company, 2005

3. Bhavikatti.S.S, "Design of Steel Structures" By Limit State Method as per IS:800–2007, IK International Publishing House Pvt. Ltd., 2009

4. Shah.V.L. and Veena Gore, "Limit State Design of Steel Structures", IS 800–2007 Structures Publications, 2009.

5. IS 800 :2007, General Construction In Steel - Code of Practice, (Third Revision), Bureau of Indian Standards, New Delhi, 2007

## 9 HRS

#### 9 HRS

**Total No of Hours: 45** 

**9 HRS** 

**9 HRS** 

**9 HRS** 



: Su	ıbject Na	me:						Ty/L	L	Τ/	<b>P/ R</b>	С
Pl	ROJECT	T PHASE	-II					b/		S.Lr		
								ETL				
								Lb	0	0/0	12/12	8
		•		•	Project	R : Res	earch C	: Credits				
•	b/Embed	ded Theor	ry and L	ab								
:												
									•	<b>.</b>		
											0	0
V	Work in a	team and	l develo	p multid	isciplina	ary ,rese	arch ski	lls				
I	Explore in	nnovative	ideas in	civil en	gineerir	ig field						
I	Develop j	projects ba	ased on	industria	al and fie	eld requi	irement	s				
Course	Outcome	es with Pr	ogram	Outcom	es (POs	5)						
<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	PO1	10 1	PO11	PO12
H	Η	Η	Η	Н	Η	H	H	Н	Н	]	H	Н
H	Η	Η	H	Н	Η	H	H	Н	Н	1	H	Н
H	H	H	H	H	H	Η	H	H	Η	]	H	Η
P	SO1	PSO	02									
			-									
		Н										
Н		Н										
tes Stro	ength of	Correlati	ion H-	High, N	M- Med	ium, L-	Low					
Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
	PI Pr Tutoria cory/Lal cory/Lal pobjective pors in a TCOM I I Course 0 PO1 H H H H H H H H H H H H H	PROJECT Prerequisit Tutorial SLr : cory/Lab/Embed : bjective of proj pers in a group o <b>TCOMES (CO</b> Work in a Explore in Develop p <b>Course Outcome</b> <b>PO1 PO2</b> <b>H H</b> <b>H</b> <b>H</b> <b>H</b> <b>H</b> <b>H</b> <b>H</b> <b>H</b>	PROJECT PHASE         Prerequisite: ALL         Tutorial       SLr: Supervise         cory/Lab/Embedded Theore         cory/COMES (COs) : (3-5         Work in a team and         Explore innovative         Develop projects bac         Course Outcomes with Pr         PO1       PO2         PO3         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H <td>PROJECT PHASE-II         Prerequisite: ALL         Tutorial       SLr : Supervised Learner cory/Lab/Embedded Theory and L         cory/COMES (COS) : (3-5)         Study         Work in a team and develop         Explore innovative ideas in         Develop projects based on it         Course Outcomes with Program         PO1       PO2       PO3         PSO1       PSO2         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H</td> <td>PROJECT PHASE-II         Prerequisite: ALL         Tutorial SLr : Supervised Learning P :         cory/Lab/Embedded Theory and Lab         ::         objective of project work is to enable the         person a group on a project involving theo         TCOMES (COs) : (3-5) Students will I         Work in a team and develop multid         Explore innovative ideas in civil en         Develop projects based on industria         Course Outcomes with Program Outcom         PO1       PO2       PO3       PO4       PO5         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H         H       H       H       H       H</td> <td>PROJECT PHASE-II         Prerequisite: ALL         Tutorial       SLr : Supervised Learning P : Project         cory/Lab/Embedded Theory and Lab         :         objective of project work is to enable the student         cers in a group on a project involving theoretical a         TCOMES (COs) : (3-5)         Students will be able to         Work in a team and develop multidisciplina         Explore innovative ideas in civil engineerin         Develop projects based on industrial and fit         Course Outcomes with Program Outcomes (POs         PO1       PO2         PO3       PO4       PO5         PO6       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H       H       H         H       H<td>PROJECT PHASE-II         Prerequisite: ALL       Tutorial SLr : Supervised Learning P : Project R : Response on y/Lab/Embedded Theory and Lab         String and the students of the students to work is to enable the students to work on a group on a project involving theoretical and expension a group on a project involving theoretical and expension a group on a project involving theoretical and expension a group on a project involving theoretical and expension a group on a project involving theoretical and expension a group on a project 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 objective of project work is to enable the students to work in corporation a group on a project involving theoretical and experimental TCOMES (COS) : (3-5) Students will be able to         Work in a team and develop multidisciplinary ,research skit       Explore innovative ideas in civil engineering field         Develop projects based on industrial and field requirement       Develop rojects based on industrial and field requirement         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8         H       H       H       H       H       H       H         PSO1       PSO2       Image: Correlation       Image: Correla</td><td>PROJECT PHASE-II       b/ ETL         Prerequisite: ALL       Lb         Tutorial SLr : Supervised Learning P : Project R : Research C: Credits cory/Lab/Embedded Theory and Lab       :         :       objective of project work is to enable the students to work in convenient bers in a group on a project involving theoretical and experimental studies         TCOMES (COS) : (3-5) Students will be able to         Work in a team and develop multidisciplinary ,research skills         Explore innovative ideas in civil engineering field         Develop projects based on industrial and field requirements         Course Outcomes with Program Outcomes (POS)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9         H       H       H       H       H       H       H       H         PSO1       PSO2      </td><td>PROJECT PHASE-II       b/ ETL         Prerequisite: ALL       Lb       0         Tutorial       SLr: Supervised Learning P: Project R: Research C: Credits cory/Lab/Embedded Theory and Lab       0         :       objective of project work is to enable the students to work in convenient groupors in a group on a project involving theoretical and experimental studies relate         TCOMES (COs) : (3-5)       Students will be able to         Work in a team and develop multidisciplinary , research skills         Explore innovative ideas in civil engineering field         Develop projects based on industrial and field requirements         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1         H       H       H       H       H       H       H       H       H         H       H       H       H       H       H       H       H       H         H       H       H       H       H       H       H       H       H         It       H       H       H       H       H       H       H       H         H       H       H       H       H       H       H       H</td><td>PROJECT PHASE-II       b/ ETL       S.Lr         Prerequisite: ALL       Lb       0       0/0         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits cory/Lab/Embedded Theory and Lab       :         ::       objective of project work is to enable the students to work in convenient groups of no pers in a group on a project involving theoretical and experimental studies related to civity (TCOMES (COS) : (3-5) Students will be able to       Work in a team and develop multidisciplinary , research skills         Explore innovative ideas in civil engineering field       Develop projects based on industrial and field requirements         Course Outcomes with Program Outcomes (POS)       PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       I         H       H       H       H       H       H       H       H       H       I         PSO1       PSO2       Image: second study       Image: second study       Image: second study       Image: second study         source strength of Correlation       H-High, M-Medium, L-Low       Image: second study       Image: second study       Image: second study         Source second study       Image: second study         Dot</td><td>PROJECT PHASE-II       b/ ETL       S.Lr         Prerequisite: ALL       Lb       0       0/0       12/12         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits sory/Lab/Embedded Theory and Lab      </td></td>	PROJECT PHASE-II         Prerequisite: ALL         Tutorial       SLr : Supervised Learner cory/Lab/Embedded Theory and L         cory/COMES (COS) : (3-5)         Study         Work in a team and develop         Explore innovative ideas in         Develop projects based on it         Course Outcomes with Program         PO1       PO2       PO3         PSO1       PSO2         H       H         H       H         H       H         H       H         H       H         H       H         H       H         H       H	PROJECT PHASE-II         Prerequisite: ALL         Tutorial SLr : Supervised Learning P :         cory/Lab/Embedded Theory and Lab         ::         objective of project work is to enable the         person a group on a project involving theo         TCOMES (COs) : (3-5) 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Subject	Subject Title :	Ty/Lb/ETI	L	T/	<b>P/ R</b>	С
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#### **OBJECTIVE**

The objective of project work is to enable the students to work in convenient groups of not more than four members in a group on a project involving theoretical and experimental studies related to civil engineering. Every project work shall have a guide who is a member of the faculty of the university.

Fourteen periods per week shall be allotted in the time table for this important activity and this time shall be utilized by the students to receive directions from the guide, on library reading, laboratory work, computer analysis or field work as assigned by the guide and also to present in periodical seminars the progress made in the project. Each student shall finally produce a comprehensive report covering background information, literature survey, problem statement, project work details and conclusions. This final report shall be typewritten form as specified in the guidelines. The continuous assessment and semester evaluation may be carried out as specified in the guidelines to be issued from time to time.



# ELECTIVE – I



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To know the basic concepts in hydrology. To study itation, evaporation and infiltration; To learn basics, estimation, and modeling of runoff: tition, forecasting and control of flood; To familiarize computer applications in hydrology       TCOMES (COs) : (3-5)       The students gain the knowledge needed on hydrologic cycle, hydrometeorology and formation of precipitation       The students are able to apply the various methods of field measurements and empirif formulae for estimating the various losses of precipitation, stream flow, flood and flor routing       The students will know the basics of groundwater and hydraulics of subsurface flows:       Course Outcomes with Program Outcomes (POs)       PO1     PO2       PO3     PO4       PO5     PO6       PO7     PO8       PO9     PO10       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H</td> <td>HYDROLOGY       Lb/ ETL       S.Lr       R         Prerequisite: None       TY       3       0/0       0/0         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits       scory/Lab/Embedded Theory and Lab       scory/Lab/Embedded Theory and Lab       scory/Lab/Embedded Theory and Lab         ::       t exposure in the field of hydrology; To know the basic concepts in hydrology. To study the fiatation, evaporation and infiltration; To learn basics, estimation, and modeling of runoff;. To u ution, forecasting and control of flood; To familiarize computer applications in hydrology       To study the faitation of precipitation         The students gain the knowledge needed on hydrologic cycle, hydrometeorology and formation of precipitation       The students are able to apply the various methods of field measurements and empirical formulae for estimating the various losses of precipitation, stream flow, flood and flood routing         The students will know the basics of groundwater and hydraulics of subsurface flows         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO         H       H       H       H       H       M       M         H       H       H       H       H       M         H       H       H       H       H       H       H</td>	HYDROLOGY     Lb/ ETL     S.Lr       Prerequisite: None     TY     3     0/0       : Tutorial     SLr : Supervised Learning P : Project R : Research C: Credits       eory/Lab/Embedded Theory and Lab       ::     texposure in the field of hydrology; To know the basic concepts in hydrology. To study itation, evaporation and infiltration; To learn basics, estimation, and modeling of runoff: tition, forecasting and control of flood; To familiarize computer applications in hydrology       TCOMES (COs) : (3-5)       The students gain the knowledge needed on hydrologic cycle, hydrometeorology and formation of precipitation       The students are able to apply the various methods of field measurements and empirif formulae for estimating the various losses of precipitation, stream flow, flood and flor routing       The students will know the basics of groundwater and hydraulics of subsurface flows:       Course Outcomes with Program Outcomes (POs)       PO1     PO2       PO3     PO4       PO5     PO6       PO7     PO8       PO9     PO10       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H     H       H	HYDROLOGY       Lb/ ETL       S.Lr       R         Prerequisite: None       TY       3       0/0       0/0         Tutorial       SLr : Supervised Learning P : Project R : Research C: Credits       scory/Lab/Embedded Theory and Lab       scory/Lab/Embedded Theory and Lab       scory/Lab/Embedded Theory and Lab         ::       t exposure in the field of hydrology; To know the basic concepts in hydrology. To study the fiatation, evaporation and infiltration; To learn basics, estimation, and modeling of runoff;. To u ution, forecasting and control of flood; To familiarize computer applications in hydrology       To study the faitation of precipitation         The students gain the knowledge needed on hydrologic cycle, hydrometeorology and formation of precipitation       The students are able to apply the various methods of field measurements and empirical formulae for estimating the various losses of precipitation, stream flow, flood and flood routing         The students will know the basics of groundwater and hydraulics of subsurface flows         Course Outcomes with Program Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO         H       H       H       H       H       M       M         H       H       H       H       H       M         H       H       H       H       H       H       H

Subject code:	Subject Title :	Ty/Lb/ET L	L	T/ S.Lr	P/ R	С
BCE18E01	HYDROLOGY	Ту	3	0/0		3

#### UNIT I INTRODUCTION

Definition & Scope- Practical applications-Hydrological cycle – Transitory systems- formation, Types and forms of precipitation – Winds and their movement–Climate & weather season in India-Catchment area

## UNIT II PRECIPITATION

Measurement of Precipitation-Recording & Non- Recording Rain Gauges-Intensity duration Analysis-Intensity frequency duration Analysis- Average depth of precipitation over an areas-Depth area duration analysis-Rain gauge network.

#### UNIT III EVAPORATION & INFILTRATION

Introduction- Evaporation process- Factors affecting Evaporation- Evaporation Eestimation-Evaporation measurement- Evapotranspiration- Factors affecting infiltration-measurement of infiltration- Infiltration Equations

#### UNIT IV STREAM FLOW MEASUREMENT & HYDROGRAPH ANALYSIS 9HRS

Introduction-Measurement of stage-discharge measument –area velocity method (Current meter method)-moving boat method- Stage discharge relationships – Flow measurements – Features of hydrograph- base flow-Hydrograph seperation

#### UNIT V GROUND WATER HYDROLOGY

Occurrence of ground water – Types of aquifer – Dupuit's assumptions – Darcy's law – Estimation of aquifer parameters – Pump tests.

#### REFERENCES

- 1. Jeya Rami Reddy.P,Hydrology, Laximi Publications, New Delhi, 2004.
- 2. Subramanya K., Hydrology, Tata McGraw Hill Co., New Delhi, 1994
- 3. Patra.K.C, Hydrology and Water Resources Engineering, Narosa Publications, 2008, 2 nd Edition, New Delhi.
- 4. Chow V.T., Maidment D.R., Mays L.W., " Applied Hydrology, McGraw Hill Publications, New

York, 1995



## 9HRS

Total No. of Hours : 45

#### 9HRS

9HRS

9HRS

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Subject Code	: S	ubject Na	ame:	-			0	0	Ty/	L	Τ/	P/ 1	R C
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BCE18E02									ET				
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T/L/ETL : The					•	Project	K : Kes	earch C	: Creat	lts			
OBJECTIVE		ao/ Linocu			au								
		knowledg	e on type	s of dam	its func	tions an	d design	n princir	oles.				
COURSE OU	<b>.</b>				<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	trons un	<u>a acoigi</u>	<u>- p</u>					
At the end of t	he cou	rse, the st	udent will	l be able	to:								
CO1		Analys	se and des	sign grav	vity dam	S							
CO2		Analys	se and des	sign eart	h and ro	ckfill da	ams						
CO3		Design	n spillway	s and en	ergy dis	sipation	structu	res					
Mapping of C	ourse	Outcome	es with Pr	ogram	Outcom	es (POs	5)						
COs/POs	PO1	PO2	PO3	PO4	DO5	DOC	<b>DO7</b>	PO8	D	<b>PO10</b>		PO11	PO12
COS/POS	POI	PO2	103	PU4	PO5	PO6	PO7	PUð	Р 09	POIU		POII	POIZ
CO1	H	H	Н	H	Μ	Н		H				Μ	М
CO2	Н	Н	Н	H	М	Н		Η				М	М
CO3	Η	Н	Н	Н	Μ	Н		Η				Μ	М
COs / PSOs	F	PSO1	PS	02				1					
CO1	H		Н										
CO2	H		Н										
Co3	H		Н										
H/M/L indica	tes Sti	rength of	Correlati	ion H-	High, N	M- Med	ium, L-	Low					ı
								II					
		Ices	ocial					Internships / Technical Skill					
Category	es	Engineering Sciences	Humanities and Social Sciences	e	Program Electives	es	Practical / Project	Tech					
	enc	ing	ies a	Cor	Elec	ctiv	/ Pr	/ sd	s				
	Sci	leer	aniti ces	am	am	Ele	ical	ihsi	Skill				
	Basic Sciences	ngir	Humaniti Sciences	Program Core	rogr	Open Electives	racti	nterr	Soft Skills				
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B.Tech – Civil Engineering - 2018 Regulation



Subject code:	Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	P/ R	C
BCE18E02	DAM ENGINEERING	Ту	3	0/0	0/0	3

#### UNIT I INTRODUCTION

Types of Dam, merits and demerits, dam site selection, selection of dam, Forces acting on gravity Dam, Methods of analysis of gravity Dam, Modes of failure and stability requirements, Design criteria and factor of safety.

#### UNIT II GRAVITY DAM

Elementary profile of a gravity dam, Low and high gravity dams, Zoning of dams, Galleries in dams, Temperature control in mass concrete; gravity dams subjected to earthquakes.

#### UNIT III BUTTRESS AND ARCH DAMS

# Buttress and Arch dams, Types, selection, merits and demerits, Elementary design Principles of Arch and Buttress dams.

#### UNIT IV EARTH DAM

Earth Dam their component and functions, causes of failure. Factors influencing the design of an earthdam. Design criteria for Earth Dam.

#### UNIT V SPILLWAY

Elementary idea of design for spillway and energy dissipaters.

#### **TEXT BOOKS**

- 1. R.S. Varshney "Concrete Dams", by 1982, NCB, Roorkee
- 2. Design of Small Dams, USBR 1960, Calcutta, Oxford and IBH
- 3. W.P. Creager, J. Justin, Daud Hinds, "Engineering for Dams" Vol. I-III, Wiley, N.Y., USA.
- 4. IS: 6512-1984, Criteria for Design of solid Gravity Dams.
- 5. IS:1893-1984, , Criteria for Earthquake resistant Design of structures.

#### REFERENCES

1. NPTEL course materials from different IITs

9HRS

#### 9HRS

#### 9HRS

#### 9HRS

#### **Total No of Hours: 45**

B.Tech – Civil Engineering - 2018 Regulation



Subject Code:	Su	bject Na	ame :						TY/	L	T / S.Lr	P/ R	C C
BCE18E03	IN	DUSTR	IAL STR	UCTU	RES				Lb/ ET L				
	Pre	requisit	e: None				Ty	3	0/0	0/0	3		
L : Lecture T :	Tutoria	1 SLr :	Supervis			Project	R : Res	search C	: Credi	ts	•		
T/L/ETL : The		/Embed	ded Theor	ry and L	ab								
OBJECTIVE								~					
• This	course	deals wit	th some of	f the spe	cial aspe	ects with	n respec	t to Civi	il Engii	neerin	g structure	s in ind	lustries.
COURSE OU At the end of the	his cour	se the st	udent shal	ll be able									
CO1	Discu	ss the pl	anning an	d function	onal requ	uiremen	ts of Ind	lustrial	structui	res.			
CO2			need to lea	ırn abou	t the des	ign con	cepts, ar	nd const	ruction	al asp	ects of		
	Indust	rial stru	cture.										
CO3	Analy	co ond o	valuate th	aimpor	topoo of	vorious	aonatru	otion m	otoriolo	for Ir	ductrial		
	Const	ruction.		-					aterials		luusutat		
Mapping of C								1				~ · ·	
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P 09	PO1	.0 P	011	PO12
CO1	Н	Н	Н	Н		М	М		М		N	1	
CO2	Н	Н	Н	Н		М	М		М		N	1	
CO3	Н	Н	Н	Н		Μ	Μ		Μ		N	1	
COs / PSOs	PS	01	PSO	02		1							
CO1	Н		Η										
CO2	Н		Н										
CO3	Н		Н										
H/M/L indica	tes Stre	ngth of	Correlati	on H-	High, N	M- Med	ium, L-	Low		I			
Category		ciences	d Social		ives	8	ject	echnical Sł					
	Basic Sciences	Engineering Sciences	Humanities and Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject code:	Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	P/ R	C
BCE18E03	INDUSTRIAL STRUCTURES	Ту	3	0/0	0/0	3

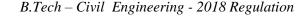
UNIT I PLANNING Classification of Industries and Industrial structures – General requirements for industries like of and steel plants – Planning and layout of buildings and components.	9HRS ement, chemical
UNIT IIFUNCTIONAL REQUIREMENTSLighting – Ventilation – Accounts – Fire safety – Guidelines from factories act.	9HRS
UNIT IIIDESIGN OF STEEL STRUCTURESIndustrial roofs - Crane girders - Mill buildings - Design of Bunkers and Silos	9HRS
UNIT IVDESIGN OF R.C. STRUCTURESSilos and bunkers – Chimneys – Principles of folded plates and shell roofs	9HRS
UNIT VPREFABRICATIONPrinciples of prefabrication – Prestressed precast roof trusses- Functional requirements for Prec	9HRS ast concrete units
Total No. of Hours:         TEXT BOOKS       1. Reinforced Concrete Structural elements – P. Purushothaman       2. Pasala Dayaratnam – Design of Steel Structure - 1990         REFERENCES       1. Henn W. Buildings for Industry, Vols. I and II, London Hill Books, 1995       2. Handbook on Functional Paguirements of Industrial buildings SP32 1086 Purgay of Structure - 1990	45

- 2. Handbook on Functional Requirements of Industrial buildings, SP32 1986, Bureau of Indian Standards, New Delhi 1990
- 3. Course Notes on Modern Developments in the Design and Construction of Industrial Structures, Structural Engineering Research Centre, Madras, 1982



Subject Code BCE18E04		bject Na	ame: NMENTA	LIMP	ACT AS	SSESSN	1ENT		TY / Lb/ ET	L	T / S.L	r P/ R	С
	Pr	erequisit	e: None					L Ty	3	0/0	0/0	3	
L : Lecture T :	Tutoria	al SLr :	Supervis	ed Learr	ning P:	Project	R : Res	search C	C: Credi	its	1	ľ	•
T/L/ETL : The	eory/Lal	o/Embed	ded Theor	ry and L	ab								
OBJECTIVE	1												
• To kn	ow the o	objective	s, capabil	ity, and	limitatio	ons of en	vironme	ental im	pact as	sessi	ment.		
• To lea	rn meth	odologie	es and lega	al aspect	s of env	ironmer	ntal impa	act asse	ssment	;			
COURSE OU	TCOM	IES (CO	(3-5)	)			-						
CO1		arry out ssessmei	scoping a	nd scree	ning of	develop	mental p	projects	for env	viron	mental a	nd social	
CO2			ifferent m	ethodolo	ogies for	enviror	nmental	impact	predict	ion a	and assess	sment	
CO3			ronmental					nmental	manag	geme	nt plans		
Mapping of C	Course (	Jutcome	es with Pr	ogram	Outcom	nes (POs	5)						
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO	9	PO10	PO11	PO12
CO1	Н	Н		Н	Н	Н	Н	Н				Н	Н
CO2	H	H		Н	Н	Н	H	Н				Н	Н
CO3	Н	Н		Н	Н	H	Η	H				Н	Н
COs / PSOs	PS	501	PS	02									
CO1	H		Н										
CO2	Н		Н										
CO3	H		Н										
H/M/L indica	tes Stre	ength of	Correlati	on H-	High, N	M- Med	ium, L-	Low					<u> </u>
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
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B.Tech – Civil Engineering - 2018 Regulation





Dr.M.G.R.

#### **Department of Civil Engineering**

Subject	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
code:				S.Lr	R	
	ENVIRONMENTAL IMPACT					
BCE18E04	ASSESSMENT	Ту	3	0/0	0/0	3
		-				

#### UNIT I INTRODUCTION

Impact of development on environment and Environmental Impact Assessment (EIA) and Environmental Impact Statement (EIS) – Objectives – Historical development – EIA capability and limitations – Legal provisions on EIA.

#### UNIT II METHODOLOGIES

Methods of EIA - Strengths, weaknesses and applicability - Appropriate methodology - Case studies.

#### UNIT III PREDICTION AND ASSESSMENT

Socio Economic Impact – Assessment of Impact on land, water and air, energy impact; Impact on flora and fauna; Mathematical models; public participation – Reports – Exchange of Information – Post Audit – Rapid EIA.

#### UNIT IV MATHEMATICAL MODELS FOR ASSESSMENT

Use the mathematical models in EIA – Water quality, air quality and noise; assumptions and limitations.

#### UNIT V ENVIRONMENTAL MANAGEMENT PLAN

Plan for mitigation of adverse impact on environment – options for mitigation of impact on water, air and land, flora and fauna, addressing the issues related to the project affected people.

#### TEXT BOOKS

- 1. Canter, R.L. Environmental Impact Assessment, McGraw Hill Inc., New Delhi, 1996.
- 2. S.K.Shukla and P.R.Srivastava, Concepts in Environmental Impact Analysis, Common Wealth Publishers, New Delhi, 1992.

#### REFERENCES

- 1. John G.Rau and David C Hooten (Ed)., Environmental Impact Analysis Handbook, McGraw Hill Book Company, 1990.
- 2. Environmental Assessment Source book, Vol. I, II & III. The World Bank, Washington, D.C., 1991.
- 3. Judith Petts, Hand book of Environmental Impact Assessment Vol. I & II, Blackwell Science, 1999.

# 9HRS

9HRS

# 9HRS

#### 9HRS

9HRS

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Total No. of Hours:45



# ELECTIVE – II



Subject Code: BCE18E05	: 5	Subject Na DES	ame : IGN OF	CONCI	RETE S	TRUC		TY / Lb/ ET L	L	T / S.Lr	P/ R	C	
	I	Prerequisit	e: Strengtl	h of mat	erials				Ту	3	0/0	0/0	3
L : Lecture T :	Tuto	rial SLr :	Supervise	ed Learr	ning P:	Project	R : Res	earch C	: Credi	ts			1
T/L/ETL : The	ory/L	ab/Embed	ded Theor	ry and L	ab								
OBJECTI	VE :												
colum • To brin	ns, sla ng abo	omprehens bs and foc	otings. erstanding	g of the b	oehaviou	ur of rein	nforced						as beams,
COURSE OU	TCO					all knev	N						
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CO2	Н	Н	Н	Н				Μ	Μ			Μ	Μ
CO3	Н	Н	Н	Н				Μ	Μ			Μ	Μ
COs / PSOs	]	PSO1	PSC	02									
CO1	Н		Н										
CO2	H		Н										
CO3	H		Н										
H/M/L indica	tes St	rength of	Correlati	on H-	High, N	M- Med	ium, L-	Low					
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject code:	Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	P/ R	С
BCE18E05	DESIGN OF CONCRETE STRUCTURES	Ту	3	0/0	0/0	3

### UNIT I INTRODUCTION, LIMIT STATE DESIGN OF BEAMS AND SLABS 9 HRS

Properties of different grades of concrete and steel, Behavior of RC members, Permissible stresses - Stress block parameters, Stress strain relationship - Failure criteria Analysis - Introduction to IS 456-2000, SP: 16 - Design and detailing of singly reinforced & doubly reinforced beam - Design and detailing of one-way and two-way slab panels – Flat Slabs (Design of beams and slabs for combined shear, bending and torsion).

### LIMIT STATE DESIGN OF COLUMNS AND FOOTINGS **UNIT II**

Basic assumptions - Design and detailing of reinforced concrete short columns of rectangular and circular cross sections under axial load - Column under compression and bi axial bending using IS 456:2000 - Design and detailing of isolated footing for column subjected to axial loads, Design and detailing of Axially and eccentrically loaded Rectangular footings, Design and detailing of Combined Rectangular footings for Two Columns.

### UNIT III DESIGN OF STAIRCASE AND WATER TANK

Introduction to ductile detailing & provisions of IS 13920, Design of Staircases - Design of circular and rectangular water tanks resting on ground. Design of staging and foundations

### **UNIT IV RETAINING WALLS**

Design of retaining walls - Cantilever and Counter fort retaining walls

### YIELD LINE THEORY AND INTRODUCTION TO BRICK MASONRY 9 HRS UNIT V

Application of virtual work method to square, rectangular, circular and triangular slabs, Design of masonrywalls and pillars as per NBC and IS codes

# **Total No of Hours: 45**

# **TEXT BOOKS**

- N.Krishna Raju "Design of Reinforced Concrete Structures", CBS publishers & Distributors. Latest 1. Edition, IS456:200.
- 2. S.Ramamrudham , Design of Reinforced Concrete Structures, Dhanpat Rai publishing company(p) Ltd New Delhi.
- 3. Varghese P C, Limit State Design of Reinforced Concrete, Prentice Hal of India, Private, Limited New Delhi, 1997.

# REFERENCES

- 1. Ashok K. Jain Reinforced concrete- Limit state design- New chand & Bros, Roorkee 1997.
- Dayarathnam.P, Brick and Reinforced Brick Structures, Oxford and IBH Publishing House, 1999. 2.
- 3. IS: 456- 2000 "Indian Standard for Plain and reinforced concrete – code of practice "Bureau of Indian Standard".
- 4. A.P Arul Manikam "Structural Engineering"
- Design aids to IS 456-1978 (SP16). 5.
- 6. SP 34 Handbook on Concrete Reinforcement and Detailing, BIS 1987.
- 7. IS 1905:1987, Code of practice for structural use of unreinforced masonry Bureau of Indian Standards.

# 9 HRS

# 9 HRS



Subject Code	: Sı	ibject Na	ime:						TY/	L	T/	P/	С
BCE18E06	н	OUSING	F PLANN	ING AN	ND DFS	ICN			Lb/ ETL		S.Lr	R	
			e: Buildir						Ty	3	0/0	0/0	3
L : Lecture T :							R : Res	earch C:			0/0	0,0	5
T/L/ETL : The	eory/La	b/Embede	led Theor	y and La	ab								
OBJECTIVE	:												
reside	ential H epende	ouse A t	ruly succ	essful p	roject is	one wh	nere proj	ect goal	s are id	lentifie	es early	y on and	ations of a where the gramming
COURSE OU													
After successf													
CO1			uildings,				Ų						
CO2			he slum c		1 0	· ·	<u> </u>	n for plo	t map c	ost flo	W		
CO3			ne financii										
Mapping of C COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P	010	PO11	PO12
	H	TT				Н						Н	_
CO1	п	Н				п		H				п	
CO2	Η	Н				Н		Н				Н	
CO3	Н	Н				Н		Н				Н	
COs / PSOs	P	SO1	PSO	02				1					
CO1	Н		Н										
CO2	Н		Н										
CO3	Н		Н										
H/M/L indica	L tes Stro	ength of	Correlati	on H-	l High, N	/- Medi	ium, L-1	Low	1	l			
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Arogram Electives     Arogram     Arogram	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject code:	Department of Civil En Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	P/ R	С
BCE18E06	HOUSING PLANNING AND DESIGN	Ту	3	0/0	0/0	3

# UNIT I INTRODUCTION TO HOUSING

Definition of Basic Terms – House, Home, Household, Apartments - Objectives of National Housing Policies, Principle of Sustainable Housing, Housing Laws at State level, Local bodies' Bye-laws at Urban and Rural Level and Development Control Regulations, Institutions for Housing at National, State and Local levels.

# UNITII HOUSING PROGRAMMES

Basic Concepts – Contents and Standards for Housing Programmes - Sites and Services, Neighbourhood, Open Development Plots, Apartments, Rental Housing, Co-operative Housing, Slum Housing Programme, Role of Public, Private and Non-Government Organisations.

# UNIT III PLANNING AND DESIGN OF HOUSING PROJECTS

Formulation of Housing Projects - Site Analysis, Layout Design, Design of Housing Units (Design Problems).

# UNIT IV CONSTRUCTION TECHNIQUES AND COST-EFFECTIVE MATERIALS 9HRS

New Constructions Techniques – Cost Effective Modern Construction Materials, Building Centers – Concept, Functions and Performance Evaluation.

# UNIT V HOUSING FINANCE AND PROJECT APPRAISAL

Appraisal of Housing Projects – Housing Finance, Cost Recovery – Cash Flow Analysis, Subsidy and Cross Subsidy, Pricing of Housing Units, Rents, Recovery Pattern (Problems).

# **Total No of Hours : 45**

# TEXT BOOKS

- 1. Meera Mehta and Dinesh Mehta, Metropolitan Housing Markets, Sage Publications Pvt. Ltd., New Delhi, 1999.
- 2. Francis Cherunilam and Odeyar D Heggade, Housing in India, Himalaya Publishing House, Bombay, 1997.

# REFERENCES

- 1. Development Control Rules for Chennai Metropolitan Area, CMA, Chennai, 200.
- 2. UNCHS, National Experiences with Shelter Delivery for the Poorest Groups, UNCHS (Habitat), Nairobi, 1994.
- 3. National Housing Policy, 1994, Government of India.

# 9HRS

9HRS

9HRS



Subject Coo BCE18E07	В		Name NG TEC ERING	HNOL		ND H			TY / Lb/ ETL	L	T/ S.L		?/ R	C
			ite: none						Ту	3	0/0	(	0/0	3
L : Lecture 7	Γ: Tuto	orial SI	Lr : Supe	rvised I	Learning	$\mathbf{P}:\mathbf{P}$	roject I	R : Res	earch C	: Cred	its			
T/L/ETL : T	heory/I	Lab/Emt	edded T	heory a	nd Lab									
OBJECTIV	<b>Е:</b> Т	o select	appropri	ate con	structio	n mater	rials and	d practi	ces in c	onstru	ction	ı field.		
COURSE C	OUTCO	OMES (	COs):((	3- 5)										
After succes	sful co	mpletion	of this c	ourse, t										
CO1		-	se the var					-						
CO2	١	Understa	and the ir	nportan	ce of cl	imate a	nd its in	nfluenc	e in coi	nstruct	ion			
CO3			and the ir	-					tion and	d air m	loven	nent in	bui	lding.
Mapping of	Cours	e Outco	mes witl	n Progr	am Ou	tcomes	$(\mathbf{POs})$							
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PC	<b>)10</b>	PO11	I	PO12
CO1	Н				Н		Н					Μ		
CO2	H				Н		Н					М		
CO3	H				Н		Н					Μ		
COs / PSOs	P	SO1	PSO	02		I								
CO1	Н		Н											
CO2	Н		Н											
CO3	Н		Н											
H/M/L indi	cates S	trength	of Corre	elation	H- Hi	igh, M-	Mediu	<b>1m, L-</b> ]	Low	1				
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills					
	Ba	Enį	Hu Sci	Prc	Prc	Op	Pra		Sol					



	Department of Civil Eng	ineering				
Subject	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
code:				S.Lr	R	
BCE18E07	BUILDING TECHNOLOGY AND HABITAT ENGINEERING	Ту	3	0/0	0/0	3

# UNIT I BUILDING STONES

Requirement of good building stone- characteristics - testing.Lime: Properties- Classifications -Manufacture -Testing of lime. Pozzolona: Natural and Artificial pozzolonas. Timber - Defects - Seasoning - Decay -Preservation, Tiles- Flooring and roofing tiles-specification-tests. Paints varnishes and distempers, Common constituents, types and desirable properties.

# UNIT II MISCELLANEOUS MATERIALS

Insulating Materials - Thermal and sound insulating material desirable properties and type. Geosynthetics and its applications .Lintels –Arches – Stairs- different types and its components. Doors, Windows and Ventilations -Classification - Technical terms-Classification and Types

# UNIT III ROOF

Types of roofs – wooden trusses .Finishing works - Plastering, pointing, painting, white washing, colour washing, distempering; Damp proofing ant termite treatment.

# UNIT IV CLIMATE AND COMFORT

Global climatic factors – Elements of climates –Classification of tropical climates- site climate . The desirable conditions- Thermal comfort factors-Thermal comfort indices – Effective temperature

# UNIT V THERMAL CONTROL

Means of thermal control - Mechanical control- structural control- ventilation and air movement

# **Total No of Hours : 45**

# **REFERENCES:**

- 1. Gurucharan Singh, Building materials,,1996
- 2. Rangwala S. C, Engineering Materials, Charotar Publishing House, 1992, Anand
- 3. Punmia B. C, Building Construction, Laxmi Publications, 1999, New Delhi.
- 4. Rangwala S. C, Building Construction, Charotar Publishing House, 1992, Anand
- 5. Huntington W.C, Building Construction, John Wiley, 1959, New York.
- 6. Koenigsberger, Manual of Tropical Housing and Building, Orient Longman Ltd

# 9HRS

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### 9HRS



Subject Cod BCE18E08	le: Si	ubject N COST	lame F EFFEC	CTIVE	BUILD	INGS			TY / Lb/ ETL	L	T / S.Lr	P/ R	C
	P	rerequisi	te: Conci	rete and	l Constr	uction '	Technol	ogy	Ту	3	0/0	0/0	3
L : Lecture 7	: Tuto	rial SL	r : Super	vised L	earning	P:Pr	oject R	: Rese	arch C: C	Credits			
T/L/ETL : T	heory/I	.ab/Emb	edded Th	neory ar	nd Lab								
OBJECTIV	E :	The goa	al of low-	-cost ho	ousing i	s to sa	ve mone	ey whil	le also m	aintainiı	ng build	lings q	uality
without sacri	ficing	the stren	gth, perfo	ormance	e and lif	e of the	e structu	ire.					
<b>COURSE O</b>	UTCO	MES (C	COs):(3	8-5)									
After success	sful con	npletion	of this co	ourse, t	he stude	ents sho	ould be a	able to					
CO1	]	Identify	the cost e	effective	e techni	ques an	d enviro	onment	al friend	ly mater	ials in c	constru	ction
CO2			the effect										
CO3			and the gr					n cons	truction f	ield.			
Mapping of	Cours	e Outco	mes with	Progr	am Out	tcomes	(POs)						
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO1	1 P	012
CO1	Н	Н			Н	Н		H			Н	H	
CO2	Н	H	Н	Н		Η			Н	H			
CO3	Н	Н			Η	Н		Η			Н	H	
COs /	P	<b>SO1</b>	PS	02									
CO1	Н		Н										
CO2	Н		Н										
CO3	Н		Н										
H/M/L indic	cates S	trength	of Corre	lation	H- Hi	gh, M-	Mediu	m, L-L	/OW				
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Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



	Subject code:	Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	P/ R	С
	BCE18E08	COST EFFECTIVE BUILDINGS	Ту	3	0/0	0/0	3
U	NIT I	<b>INTRODUCTION TO COST EFFECTIVE</b>	CONSTRUCT	ION	Ī	•	12HRS

UNIT I INTRODUCTION TO COST EFFECTIVE CONSTRUCTION 12HRS Introduction to the concept of cost effective construction -Uses of different types of materials and their availability -Stone and Laterite blocks- Burned Bricks- Concrete Blocks- Stabilized Mud Blocks- Lime-Poszolana Cement-Gypsum Board- Light Weight Beams- Fiber Reinforced Cement Components- Fiber Reinforced Polymer Composite- Bamboo- Availability of different materials-Recycling of building materials – Brick- Concrete- Steel-Plastics - Environmental issues related to quarrying of building materials.

# UNIT II TECHNOLOGIES & METHODS IN CONSTRUCTION

Environment friendly and cost effective Building Technologies - Different substitute for wall construction Flemish Bond - Rat Trap Bond – Arches – Panels - Cavity Wall - Ferro Cement and Ferro Concrete constructions – different pre cast members using these materials - Wall and Roof Panels – Beams – columns - Door and Window frames -Water tanks - Septic Tanks - Alternate roofing systems - Filler Slab - Composite Beam and Panel Roof -Preengineered and ready to use building elements - wood products - steel and plastic - Contributions of agencies

# UNIT III GLOBAL WARMING & THE RELEVANCE OF GREEN BUILDINGS 7 HRS

Global Warming – Definition - Causes and Effects - Contribution of Buildings towards Global Warming - Carbon Footprint – Global Efforts to reduce carbon Emissions - Green Buildings – Definition - Features- Necessity – Environmental benefit - Economical benefits- Health and Social benefits - Major Energy efficient areas for buildings – Embodied Energy in Materials- Green Materials - Comparison of Initial cost of Green V/s Conventional Building - Life cycle cost of Buildings.

# UNIT IV GREEN BUILDING

Green Buildings – Definition - Features- Necessity – Environmental benefit - Economical benefits - Health and Social benefits - Major Energy efficient areas for buildings - Embodied Energy in Materials-Green Materials -Comparison of Initial cost of Green V/s Conventional Building - Life cycle cost of Buildings.

# UNIT V GREEN DESIGN

Green Design – Definition - Principles of sustainable development in Building Design - Characteristics of Sustainable Buildings – Sustainably managed Materials - Integrated Lifecycle design of Materials and Structures (Concepts only)

# **Total No of Hours : 45**

# **REFERENCES:**

- 1. K S Jagadeesh, B V Venkatta Rama Reddy & K S Nanjunda Rao ,Alternative Building Materials and Technologies , New Age International Publishers.
- 2. Asko Sarja, Integrated Life Cycle Design of Structures, SPON Press.
- 3. D S Chauhan and S K Sreevasthava, Non conventional Energy Resources, New Age International Publishers.
- 4. Laurie Backer, Buildings How to Reduce Cost, Cost Ford.

# 12 HRS





# **ELECTIVE-III**



Subject Code	: 5	Subject Na	ame						TY / Lb/	L	T / S.Lr	P/ R	C			
BCE18E09	Ι	NDUSTR	RIAL WA	STE M	ANAGI	EMENT			ETL		<b>5.L</b> I					
	F	Prerequisit	e: Water s	supply a	nd sanita	ary engi	neering		Ту	3	0/0	0/0	3			
L : Lecture T :	Tutor	ial SLr :	: Supervis	ed Lear	ning P:	Project	R : Res	earch C	: Credits							
T/L/ETL : The	eory/L	ab/Embed	ded Theo	ry and L	ab											
OBJECTIVE	:															
		nowledge				0	ons.									
		nd the trea														
			by b						nd the methods of controlling the san							
			<b>IES</b> ( <b>COs</b> ) : (3-5) letion of this course, the students should be able to													
CO1			tion of this course, the students should be able to ggest the industrial waste disposal methods on lan						and water environment							
CO2			nduct waste audit in an industry and implement wa													
CO3			entify the impacts on environment due to various in													
			entify the impacts on environment due to various industrial effluents. utcomes with Program Outcomes (POs)													
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO1	0 PC	011	PO12			
CO1	Н			М	Н	Η	Н	Η		Μ	H		Η			
CO2	Н			М	Н	Н	Н	Н		М	H		Н			
CO3	Н			М	Н	Η	Н	Н		М	H		Н			
COs / PSOs	]	PSO1	PS	02		1		1								
CO1	Н		Н													
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CO3	Н		Н													
H/M/L indica	tes St	rength of	Correlat	ion H·	High, I	M- Med	ium, L-	Low								
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### **Department of Civil Engineering** Subject **Subject Title :** Ty/Lb/ETL L **T**/ P/ С code: S.Lr R 0/0 **BCE18E09 INDUSTRIAL WASTE MANAGEMENT** 3 0/0 3 Ty

# UNIT I INTRODUCTION

Types of industries and industrial pollution – Characteristics of industrial wastes – Population equivalent – Bioassay studies – effects of industrial effluents on streams, sewer, land, sewage treatment plants and human health – Hazardous Wastes – Environmental legislations related to prevention and control of industrial effluents and hazardous wastes – Pollution Control Boards.

# UNIT II CLEANER PRODUCTION

Waste management Approach – Waste Audit – Volume and strength reduction – material and process modifications – Recycle, reuse and byproduct recovery – Applications.

# UNIT III TREATMENT OF INDUSTRIAL WASTEWATER

Equalisation – Neutralisation – removal of suspended and dissolved organic solids - Chemical oxidation – Removal of dissolved inorganics – Combined treatment of industrial and municipal wastes – Residue management.

# UNIT IV TREATMENT AND DISPOSAL OF HAZARDOUS WASTES

Physio chemical treatment – solidification – incineration – Secured landfills – Legal Provisions.

# UNIT V CASE STUDIES

Sources, Characteristics, waste treatment flow sheets for selected industries such as Textiles, Tanneries, Dairy, Sugar, Paper, distilleries, Steel plants, Refineries, fertilizer, thermal power plants.

# Total No. of Hours:45

# **TEXT BOOKS**

- 1. M.N.Rao & A.K.Dutta, Wastewater Treatment, Oxford IBH Publication, 1995.
- 2. W.W. Eckenfelder Jr., Industrial Water Pollution Control, McGraw-Hill Book Company, New Delhi, 1994.

# REFERENCES

- 1. T.T.Shen, Industrial Pollution Prevention, Springer, 1999.
- 2. R.L.Stephenson and J.B.Blackburn, Jr., Industrial Wastewater Systems Hand book, Lewis Publisher, New York,
- 3. H.M.Freeman, Industrial Pollution Prevention Hand Book, McGraw Hill Inc., New Delhi, 1995.

# 9HRS

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Subject Code	: 5	Subject Na		EANER	PROD	UCTIO	N		TY / Lb/	L	T / S.Lr	P/ R	C
BCE18E10									ETL				
		rerequisit				<b>.</b> .			Ty	3	0/0	0/0	3
L : Lecture T :	Tutor	1al SLr :	Supervis	ed Lear	ning P:	Project	R : Res	search C	: Credi	ts			
T/L/ETL : The	eory/L	ab/Embed	ded Theo	ry and L	ab								
OBJECTIVE	:												
• To dev	velop a	a basic kno	owledge a	bout the	e cleaner	produc	tion and	apply th	ne same	e in the	e field aj	pplicatio	n.
• To ed	ucate	the studer	nts on con	mplete 1	manager	nent pri	nciples	related	to Clea	aner P	roductic	on and C	Control of
		ollution.		1	U	1	I						
COURSE OU	TCO	MES (CO	s): (3-5	6)									
The students c			· ·	,	n								
CO1		insight to				and clea	aner proc	duction	concep	t			
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CO3		ability to					/	plement	waste	minin	nization	techniqu	ies
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COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	POS		PO10	PO11	PO12
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CO3	H	Н		Н	Н	Н	Н	Н				Η	М
COs / PSOs	I	PSO1	PS	02									
CO1	H		Н										
CO2	Н		Н										
CO3	H		Н										
H/M/L indica	ites St	rength of	Correlat	ion H	- High, I	M- Med	lium, L-	Low					
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	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject code:	Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	P/ R	С
BCE18E10	CLEANER PRODUCTION	Ту	3	0/0	0/0	3

# UNIT I INTRODUCTION

Sustainable Development - Indicators of Sustainability - Sustainability Strategies - Barriers to Sustainability - Cleaner Production (CP) in Achieving Sustainability - Environmental Policies and Legislations - Regulations to Encourage Pollution Prevention and Cleaner Production – Regulatory versus Market Based Approaches

# UNIT II CLEANER PRODUCTION CONCEPT

Definition - Importance - Benefits - Promotion - Barriers - Role of Industry, Government and Institutions -Environmental Management Hierarchy - Source Reduction Techniques - Process and equipment optimisation, reuse, recovery, recycle, raw material substitution.

# UNIT III CLEANER PRODUCTION PROJECT DEVELOPMENT AND IMPLEMENTATION 9 HRS

Overview of CP Assessment Steps and Skills, Preparing for the Site Visit, Information Gathering, and Process Flow Diagram, Material Balance, Establishing a Program - Organizing a Program - Preparing a Program Plan -Measuring Progress - Pollution Prevention and Cleaner Production Awareness Plan - Waste audit -Environmental Statement.

# UNIT IV LIFE CYCLE ASSESSMENT

Elements of LCA - Life Cycle Costing - Eco Labelling - Design for the Environment – International Environmental Standards - ISO 14001 - Environmental audit.

# UNIT V CASE STUDIES

Industrial applications of CP, LCA, EMS and Environmental Audits.

# **Total No of Hours :45**

# REFERENCES

- 1. Paul L Bishop (2000) " Pollution Prevention: Fundamentals and Practice " McGraw-Hill International New York.
- 2. World Bank Group (1998) "Pollution Prevention and Abatement Handbook"
- 3. "Towards Cleaner Production", World Bank and UNEP, Washington D.C.
- 4. Prasad modak, C.Viswanathan and Mandar parasnis (1995)"Cleaner Production Audit ", Environmental System Reviews, No.38, Asian Institute of Technology, Bangkok.

# 9 HRS

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9 HRS



Subject Code	: S	ubject Na	ame				8		TY/	L	Τ/	<b>P</b> /	R	С
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BCE18E11	Р	rerequisit	e: NONE						Ty	3	0/0	0/0	) 3	3
L : Lecture T :		<b>^</b>			ning P:	Project	R : Res	search C	: Credits					
T/L/ETL : The	eory/La	ab/Embed	lded Theo	ry and L	ab									
OBJECTIVE	:													
			on archit		design o	f structu	res as p	er the z	oning reg	gulatic	ons			
COURSE OU			, ,	,										
		*	on of this course, the students should be able to orm architectural design of structures											
CO1		-												
CO2		22	he land re	•		the zon	ing regu	ilations						
CO3		-	Land scap											
Mapping of C	Course	Outcome	tcomes with Program Outcomes (POs)											
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO	<b>D10</b>	PO11	PO	012
CO1	H	Н	Μ			Н	Н	Н	Μ			Н	Μ	
CO2	Н	Н	Μ			Н	Н	Н	М			Η	Μ	
CO3	H	Н	Μ			Н	Н	Н	Μ			Н	Μ	
COs / PSOs	I	PSO1	PS	02		1								
CO1	H		Н											
CO2	H		Н											
CO3	H		Н											
H/M/L indica	tes Sti	rength of	Correlat	ion H-	• High, I	M- Med	ium, L-	Low				I		
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core		Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills					

# Maduravoyal , Chennai - 600 095 **Department of Civil Engineering**

Dr.M.G.R. Educational and Research Institute (DEEMED TO BE UNIVERSITY) (An ISO Certified Institution) ersity with Graded Autonomy S

Subject code:	Subject Title :	Ty/Lb/ETL	L	T/ S.Lr	P/ R	С
BCE18E11	ARCHITECTURE AND TOWN PLANNING	Ту	3	0/0	0/0	3

### **ARCHITECTURAL DEVELOPMENT:** UNIT I

Natural and built environment, historic examples, factors influence architectural development.

### UNIT II PRINCIPLES OF ARCHITECTURAL DESIGN

Design methods, primary elements, form, space, organization, circulation, proportion and scale, ordering principles;

### **FUNCTIONAL PLANNING OF BUILDINGS:** UNIT III

Planning, designing and construction, general building requirements, permit and inspection (as per the National building Code);

### **UNIT IV EVOLUTION OF TOWNS:**

History and trends in town planning: origin and growth, historical development of town planning in ancient valley civilizations; Objects and necessary of town planning; Surveys and analysis of a town; New Concepts in town planning: Garden city movement, Linear city and Satellite city concepts, Neighborhood Planning;

### UNIT V PLANNING PRINCIPLES, PRACTICE AND TECHNIQUES:

Elements of City plan, Estimating future needs, Planning standards, Zoning - its definition, procedure and districts, height and bulk zoning, F. A. R., Master Plan; Concepts of Urban planning, Design and Landscaping. **Total No of Hours: 45** 

# TEXT BOOKS

1. B. Gallion and S. Eisner, The Urban Pattern: City planning and Design - C B S publishers, 5th edition, 2005.

2. D. K. Francis Ching, Architectures: Form, Space and Order, John Wiley, 2nd edition 1996.

# REFERENCES

- 1. National Building Code of India 2005, BIS, New Delhi.
- 2. S. Eisner, A. B. Gallion and S. Eisner, The Urban Pattern: City planning and Design, John Wiley 6th edition 1996.

# 9HRS

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# 9HRS



Subject Code	: Su	ibject Na	me:	2			8		TY/	L	Τ/	P/ R	C
BCE18E12	C	ONSTRU	UCTION	MANA	GEME	NT			Lb/ ET L		S.Lr	•	
	Pr	erequisit	e: NONE						Ту	3	0/0	0/0	3
L : Lecture T :			-		•	Project	R : Res	earch C	C: Credi	ts			
T/L/ETL : The	•	b/Embed	ded Theor	ry and L	ab								
OBJECTIVE	:												
			ware of the			ruction	techniqu	es and	practice	es.			
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COURSE OU					40 mlan		4	ia ata ar	- la a de 1 a	41			
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CO2		liagrams,	e the cost	of the pr	niect co	ntrol the	a cost of	the prof	ect by	progting	cash f	lows and	udgeting
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CO3			ge about d					15 1001					
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CO2	H					H	Μ	Μ		Ν	[		Н
CO3	Н					Н	Μ	Μ		Μ	[		Н
COs / PSOs	P	<b>SO1</b>	PSC	02									
CO1	Н		Н										
CO2	H		Н										
CO3	Η		Н										
H/M/L indica	tes Str	ength of	Correlati	ion H-	High, N	M- Med	ium, L-	·					
Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				



Subject	Subject Title :	Ty/Lb/	L	T/ S.Lr	<b>P/ R</b>	С
code:		ETL				
BCE18E12	CONSTRUCTION MANAGEMENT		3	0/0	0/0	3
		Ту				

### UNIT I **NETWORK TECHNIQUES**

Introduction to network techniques - Use of CPM and PERT for planning - Scheduling and control of construction work, bar charts Error in networks, Types of nodes and node numbering systems.

### UNIT II **CONSTRUCTION PLANNING**

Basic concepts in the development of construction plan - Planning for construction and site facilities using networks - Preparation of construction schedules for jobs, materials, and equipment using CPM.

### COST CONTROL OF CONSTRUCTION UNIT III **9 HRS**

Construction quality control and inspection - Significance of variability and estimation of risks - Construction cost control - Crashing of networks.

### **QUALITY AND SAFETY DURING CONSTRUCTION UNIT IV** 9 HRS

Importance of Quality and safety – Organizing for quality and safety – safety measures – Prevention of fire at construction site - Elements and organization of quality - Quality assurance techniques.

### MANAGEMENT INFORMATION SYSTEM UNIT V

Definition of MIS - Requirement of MIS - Database approach - Types of project information - Accuracy and use of information.

### **Total No of Hours: 45**

# **TEXT BOOKS**

- Chitkara, K.K "Consruction Project Management Planning "Scheduling And Control, Tata Mc Graw -1. Hill Publishing Co., Newdelhi, 1998.
- 2. S. Seetharaman - Construction Engineering & Management, Dhanpat Rai Publications, Pune, 1995.

# REFERENCES

- 1. Construction Management - Sangareddy And Meyyappan, Prathibha Publications, Cbe, 1994.
- Moder. J., C. Phillips And Davis, "Project Management With Cpm, Pert And Precedence 2. Diagramming, 1999.
- Prasanna Chandra, "Project Management", Tmh, New Delhi, 1997. 3.

# 9 HRS

# **9 HRS**



# **ELECTIVE-IV**



Subject Code: BCE18E13	STF	oject Na RUCTU GINEE	JRAL DY	'NAMI(	CS ANI	) EART	'H QUA	KE	TY / Lb/ ET L	L	T / S.L	r P/1	R C
			e: Structur	al Anal	ysis				Ty	3	0/0	0/0	3
L : Lecture T : Tu	itorial	SLr:	Supervise	ed Learn	ing P:	Project	R : Res	earch C	: Credi	its			
T/L/ETL : Theory	//Lab/l	Embedo	ded Theor	y and La	ab								
<b>OBJECTIVE :</b>													
						of struc	tural dy	namics	the cha	aract	eristic of	dynamic	behaviour
of the stru		•	· •	-									
-	-		spects of	various	theories	s of caus	se of ear	thquake	e and r	neas	urement	of its effe	cts on the
structure a			s): (3-5)	)									
At the end of the o													
C01		-	ormulate		ve free a	nd force	d vibrati	ions res	ponse	of str	uctural s	vstems	
CO2		-	ledge to a						-			5	
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Mapping of Cou	rse O	utcome	s with Pr	ogram (	Outcom	es (POs	)						
COs/POs P	01	PO2	PO3	PO4	PO5	PO6	PO7	<b>PO8</b>	PO	)	PO10	PO11	PO12
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B.Tech – Civil Engineering - 2018 Regulation

code:<br/>BCE18E13STRUCTURAL DYNAMICS AND EARTH<br/>QUAKE ENGINEERINGTyS.LrRR0/03

# UNIT I SINGLE DEGREE OF FREEDOM SYSTEMS

Formulation of equation of motion-free and forced vibrations-response to dynamic Loading-effect of damping

# UNIT II MODAL ANALYSIS

Subject

Subject Title :

Free and forced vibration of un-damped and damped MDOF systems- equation of Motions- evaluation of natural frequencies and modes

# UNIT III INTRODUCTION TO EARTH QUAKE ENGINEERING

Elements of engineering seismology- characteristics of earth quake engineering- earth quake history- Indian seismicity.

# UNIT IV BEHAVIOUR OF STRUCTURES AND SOIL

Performance of structures under past earth quakes- lessons learnt from past earth Quakes- behavior of soil under earth quake loading- soil liquefaction- soil structure Interaction effects.

# UNIT V EARTH QUAKE RESISTANT DESIGN

Concept of Earth quake resistant design- provisions of seismic code IS-1893 (part I)- 2002- response spectrumdesign spectrum- seismic coefficient- design of buildings.

# TEXT BOOKS

- 1. Clough R. W, and Penzien J, Dynamics of structures, Second Edition, Mc Graw-Hill International edition, New Delhi, 1993
- 2. Mario Paz, structural dynamics- theory and computations, Third Editions CBS Publishers, New Delhi, 1990.

# REFERENCES

- 1. Minoru Wakabayashi, Design of earth quake resistant buildings,Mc Graw-Hill book company, New York 1986
- 2. Anil K Chopra, Dynamics Of Structures- Theory and applications to Earth quake engineering, Prentice hall inc, 2001



Ty/Lb/ETL

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**Total No of Hours: 45** 

# 9 HRS

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# 9 HRS

**9 HRS** 

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Subject	Subject Title :	Ty/Lb/ETL	L	Τ/	<b>P</b> /	С
code:				S.Lr	R	
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<b>BCE18E14</b>	BRIDGE STRUCTURES		3	0/0	0/0	3

# UNIT I INTRODUCTION

Design of through type steel highway bridges for IRC loading - Design of stringers, cross girders and main girders - Design of deck type steel highway bridges for IRC loading - Design of main girders.

# UNIT II STEEL BRIDGES

Design of pratt type truss girder highway bridges - Design of top chord, bottom chord, web members - Effect of repeated loading - Design of plate girder railway bridges for railway loading - Wind effects - Design of web and flange plates - Vertical and horizontal stiffeners.

# UNIT III REINFORCED CONCRETE SLAB BRIDGES

Design of solid slab bridges for IRC loading - Design of kerb - Design of tee beam bridges - Design of panel and cantilever for IRC loading.

# UNIT IV REINFORCED CONCRETE GIRDER BRIDGES

Design of tee beam - Courbon's theory - Pigeaud's curves - Design of balanced cantilever bridges - Deck slab - Main girder - Design of cantilever - Design of articulation.

# UNIT V PRESTRESSED CONCRETE BRIDGES

Design of prestressed concrete bridges - Preliminary dimensions - Flexural and torsional parameters -Courbon's theory - Distribution coefficient by exact analysis - Design of girder section - Maximum and minimum prestressing forces - Eccentricity - Live load and dead load shear forces - cable zone in girder –Check for stresses at various sections - Check for diagonal tension - Diaphragms - End block - Short term and long term deflections.

# Total No. of Hours: 45

# **TEXT BOOKS**

1. Johnson Victor D., "Essentials of Bridge Engineering", Oxford and IBH Publishing Co., New Delhi, 1990.

2. Ponnuswamy S., " Bridge Engineering ", Tata McGraw Hill, New Delhi, 1996.

# REFERENCES

1. Phatak D.R., "Bridge Engineering", Satya Prakashan, New Delhi, 1990.

9HRS

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# 9HRS



Subject	Subie	ect Nan	ne	<b>I</b>	<i>i</i> cparti			Engineer	TY / Lb/	L	Τ/	<b>P</b> /	С
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Subject	Subject Title :	Category	Ty/Lb/ETL	L	Τ/	<b>P/ R</b>	С
code:					S.Lr		
BCE18E15	PRESTRESSED CONCRETE	PEC	Ту	3		0/0	
	STRUCTURES				0/0		3

### UNIT I **INTRODUCTION – THEORY AND BEHAVIOUR**

Basic concepts – Advantages – Materials required – Systems and methods of pre-stressing – Analysis of sections - Stress concept - Strength concept - Load balancing concept - Effect of loading on the tensile stresses in tendons

### UNIT II DEFLECTION

Deflections - Factors influencing deflections - Calculation of deflections - Short term and long term deflections - Losses of pre-stress - Losses of prestress - types - losses due to elastic deformation of concrete - shrinkage of concrete - creep of concrete - friction - anchorage slip - Estimation of crack width

### UNIT III DESIGN

Flexural strength – Simplified procedures as per codes – strain compatibility method – Basic concepts in selection of cross section for bending – stress distribution in end block, Design of anchorage zone reinforcement – Limit state design criteria.

### **UNIT IV** CIRCULAR PRESTRESSING

General features & Design of prestressed concrete tanks – Prestressed concrete Poles, Shapes, Features & Design- Prestressed concrete sleepers – Development – Types- Design, Static & dynamic loads

### UNIT V **COMPOSITE CONSTRUCTION**

Analysis for stresses – Estimate for deflections – Flexural and shear strength of composite members– General aspects - pretension pre-stressed bridge decks - Post tensioned pre-stressed bridge decks -Advantages over R.C.C bridges- Design Principles of post tensioned prestressed concrete slab bridge deck, T Beam slab bridge deck & Continuous two span beam deck

# TEXT BOOKS

- Krishna Raju N., Prestressed concrete, Tata McGraw Hill Company, New Delhi, 2011 1.
- 2. S.Ramamrutham, Prestressed concrete, Dhanpatrai Publishing company, 2014
- 3. Mallic S.K. and Gupta A.P., Prestressed concrete, Oxford and IBH Publishing Co.Pvt. Ltd. 1997.
- 4. Rajagopalan.N, Prestressed Concrete, Alpha Science, 2002.

# REFERENCES

- 1. Ramaswamy G.S., Modern Prestressed Concrete Design, Arnold Heinimen, New Delhi, 1990
- 2. Lin T.Y. Design of prestressed concrete structures, Asia Publishing House, Bombay 1995

# 9HRS

# 9HRS

### 9HRS

### **Total No of Hours: 45**

9HRS



Subject Code	: Su	ibject Na	ame						TY/	L	T/	P/	С
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Subject	Subject Title :	Ty/Lb/ETL	L	Τ/	<b>P</b> /	С
code:				S.Lr	R	
BCE18E16	TALL BUILDINGS	Ту	3	0/0	0/0	3

### UNIT I **INTRODUCTION**

The Tall Building in the Urban Context - The Tall Building and its Support Structure - Development of High Rise Building Structures - General Planning Considerations. Dead Loads - Live Loads-Construction Loads -Snow, Rain, and Ice Loads - Wind Loads-Seismic Loading -Water and Earth Pressure Loads - Loads - Loads Due to Restrained Volume Changes of Material - Impact and Dynamic Loads - Blast Loads - Combination of Loads.

### THE VERTICAL STRUCTURE PLANE **UNIT II**

Dispersion of Vertical Forces- Dispersion of Lateral Forces - Optimum Ground Level Space - Shear Wall Arrangement - Behaviour of Shear Walls under Lateral Loading. The Floor Structure or Horizontal Building Plane Floor Framing Systems-Horizontal Bracing- Composite Floor Systems The High - Rise Building as related to assemblage Kits Skeleton Frame Systems - Load Bearing Wall Panel Systems - Panel - Frame Systems -Multistory Box Systems.

### **UNIT III COMMON HIGH-RISE BUILDING STRUCTURES AND** THEIR BEHAVIOUR UNDER LOAD

The Bearing Wall Structure- The Shear Core Structure - Rigid Frame Systems- The Wall - Beam Structure: Interspatial and Staggered Truss Systems - Frame - Shear Wall Building Systems - Flat Slab Building Structures - Shear Truss - Frame Interaction System with Rigid - Belt Trusses - Tubular Systems-Composite Buildings -Comparison of High - Rise Structural Systems Other Design Approaches Controlling Building Drift Efficient Building Forms - The Counteracting Force or Dynamic Response.

APPROXIMATE STRUCTURAL ANALYSIS AND DESIGN OF BUILDING **UNIT IV** 9HRS Approximate Analysis of Bearing Wall Buildings The Cross Wall Structure - The Long Wall Structure The Rigid Frame Structure Approximate Analysis for Vertical Loading – Approximate Analysis for Lateral Loading -Approximate Design of Rigid Frame Buildings-Lateral Deformation of Rigid Frame Buildings The Rigid Frame - Shear Wall Structure - The Vierendeel Structure - The Hollow Tube Structure.

### UNIT V **OTHER HIGH-RISE BUILDING STRUCTURE**

Deep - Beam Systems - High-Rise Suspension Systems - Pneumatic High - Rise Buildings - Space Frame Applied to High - Rise Buildings - Capsule Architecture.

# **TEXT BOOKS**

- Wolfgang Schueller " High-Rise Building Structures", John Wiley&Sons. 1.
- 2. Bryan Stafford Smith And Alex Coull, " Tall Building Structures ", Analysis And Design, John Wiley And Sons, Inc., 1991.

# REFERENCES

- Coull, A. and Smith, Stafford, B. " Tall Buildings ", Pergamon Press, London, 1997. 1.
- 2. LinT.Y. and Burry D.Stotes, "Structural Concepts and Systems for Architects and Engineers", John Wiley, 1994.
- 3. Lynn S.Beedle, Advances in Tall Buildings, CBS Publishers and Distributors, Delhi, 1996.

# 9HRS

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# 9HRS

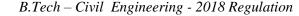
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# **ELECTIVE- V**



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BCE18E17	STRUCTURES	Ту	3	0/0	0/0	3

### UNIT I MAINTENANCE AND REPAIR STRATEGIES

Maintenance- Repair and Rehabilitation. Facts of Maintenance - Importance of Maintenance- Various aspects of Inspection- Assessment procedure for evaluating a damaged structure, Causes of deterioration.

### UNIT II STRENGTH AND DURABILITY OF CONCRETE

Quality assurance for concrete – Strength, Durability and Thermal properties, of concrete - Cracks, different types, causes - Effects due to climate, temperature, Sustained elevated temperature, Corrosion - Effects of cover thickness.

### UNIT III SPECIAL CONCRETES

Polymer concrete, Sulphur infiltrated concrete, Fibre reinforced concrete, High strength and High-performance concrete, Vacuum concrete, Self-compacting concrete, Whisper concrete Geopolymer concrete, Reactive powder concrete, Concrete made with industrial wastes.

### **UNIT IV TECHNIQUES FOR REPAIR AND PROTECTION METHODS** 9 HRS

Non-destructive Testing Techniques, Epoxy injection, Shoring, Underpinning, Corrosion protection techniques – Corrosion inhibitors, Corrosion resistant steels, Coatings to reinforcement, Cathodic protection.

### UNIT V **RETROFITTING AND DEMOLITION TECHNIQUES**

Strengthening of Structural elements, Repair of structures distressed due to corrosion, fire, Leakage, earthquake -Engineered demolition methods - Case studies.

# **Total No of Hours: 45**

# **TEXTBOOKS:**

- 1. Shetty M.S., "Concrete Technology - Theory and Practice", S. Chand and Company, 2008.
- 2. Gambhir. M.L., "Concrete Technology", McGraw Hill, 2013
- 3. Denison Campbell, Allen and Harold Roper, "Concrete Structures, Materials, Maintenance and Repair", Longman Scientific and Technical UK, 1991.

# **REFERENCES:**

- Ravi Shankar. K. Krishnamoorthy. T.S, "Structural Health Monitoring, Repair and Rehabilitation 1. of Concrete Structures", Allied Publishers, 2004.
- 2. Dov Kominetzky. M.S., "Design and Construction Failures", Galgotia Publications Pvt. Ltd., 2001
- CPWD and Indian Buildings Congress, Hand book on Seismic Retrofit of Buildings, Narosa 3. Publishers, 2008.
- Allen R.T. & Edwards S.C, Repair of Concrete Structures, Blakie and Sons, UK, 1987 4.

# 9 HRS

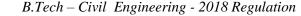
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B.Tech – Civil Engineering - 2018 Regulation





Subject	Subject Title :			Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
code:						S.Lr	R	
BCE18E18	MUNICIPAL	SOLID	WASTE					
	MANAGEMENT			Ту	3	0/0	0/0	3

### UNIT I SOURCES AND TYPES

Sources and types of solid wastes in a Municipality; Quantity – factors affecting generation of solid wastes; characteristics – methods of sampling and characterization; Effects of improper disposal of solid wastes – public health effects. Principle of solid waste management - social & economic aspects; Public awareness; Role of NGOs; Legislation.

### UNIT II **ON-SITE STORAGE & PROCESSING**

On-site storage methods – materials used for containers – on-site segregation of solid wastes – public health & economic aspects of storage – options under Indian conditions – Critical Evaluation of Options.

### **COLLECTION AND TRANSFER UNIT III**

Methods of Collection – types of vehicles – Manpower – collection routes; transfer stations – selection of location, operation & maintenance; options under Indian conditions.

### **UNIT IV OFF-SITE PROCESSING**

Processing techniques and Equipment; Resource recovery from solid wastes – composting, incineration, options under Indian conditions.

### UNIT V DISPOSAL

Dumping of solid waste; sanitary landfills – site selection, design and operation of sanitary landfills. **Total No. of Hours :45** 

# TEXT BOOKS

George Techobanoglous et.al., Integrated Solid Waste Management, McGraw Hill Publishers, 1993. 1.

B.Bilitewski, G.HardHe, K.Marek, A.Weissbach, and H.Boeddicker, Waste Management, Springer, 1994. 2.

# REFERENCES

- 1. Manual on Municipal Solid Waste Management, CPHEEO, Ministry of Urban Development, Government of India, New Delhi, 200
- R.E.Landreth and P.A.Rebers, Municipal Solid Wastes problems and Solutions, Lewis Publishers, 1997 2.
- 3. Bhide A.D. and Sundaresan, B.B., Solid Waste Management in Developing Countries; INSDOC, 1993.

# 9HRS

9HRS

# 9HRS

# 9HRS



Subject C-1				Бера	rtment		Engine	ering	TX /	т	TT /	D/T	
Subject Code BCE18E19		Subject Na FINITE I		CLEMENT ANALYSIS					TY / Lb/ ETL	L	T / S.Lr	. <b>P/ F</b>	C C
		Prerequisite							Ту	3	0/0	0/0	3
L : Lecture T :	Tutor	ial SLr :	Supervise	ed Learn	ing P:1	Project	R : Rese	earch C:	Credits				
T/L/ETL : The	eory/La	ab/Embedo	led Theor	y and La	ab								
OBJECTIVE													
		ive is to e											
		the behavi ering probl											ve physica
COURSE OU After successf					udents s	hould be	able to						
CO1									r any ph	vsical	proble	ms using	
		Students will be in a position to develop computer codes for any physical problems using FE techniques											
CO2		apply the concept of the differential equilibrium equations and their relationship in the analysis of structures											
CO3		apply nun	nerical me	thods to	FEM fo	or structu	ural anal	ysis					
Mapping of C	Course	Outcome	s with Pr	ogram (	Outcom	es (POs)	)	-					
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P	010	PO11	PO12
CO1	Н	Н	Н	Н								Н	Н
CO2	H	Н	Н	Н								Н	Н
CO3	Н	Н	Н	Н								Н	Н
COs / PSOs	I	PSO1	PSO	02									
CO1	H		Н										
CO2	H		Η										
CO3	Н		Н										
H/M/L indica	tes Sti	rength of	Correlati	on H-	L High, N	I- Medi	um, L-I	JOW					
								ıl Sł					
Category		ces	Social					Internships / Technical Skill					
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B.Tech – Civil Engineering - 2018 Regulation



Subject	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
code:				S.Lr	R	
BCE18E19	FINITE ELEMENT ANALYSIS					
		Ту	3	0/0	0/0	3

### **INTRODUCTION – VARIATIONAL FORMULATION** UNIT I

General filed problems in Engineering - Modelling - Discrete and Continuous models - Characteristics -Difficulties involved in solution – The relevance and place of the finite element method – Historical comments – Basic concept of FEM, Boundary and initial value problems – Gradient and divergence theorems – Functionals – Variational calculus – Variational formulation of VBPS. The method of weighted residuals – The Ritz method.

### UNIT II FINITE ELEMENT ANALYSIS OF ONE DIMENSIONAL PROBLEMS 8HRS

One dimensional second order equations – discretisation of domain into elements – Generalised coordinates approach – derivation of elements equations – assembly of elements equations – imposition of boundary conditions - solution of equations - Cholesky method - Post processing - Extension of the method to fourth order equations and their solutions – time dependant problems and their solutions – example from heat transfer, fluid flow and solid mechanics.

### UNIT III FINITE ELEMENT ANALYSIS OF TWO DIMENSIONAL PROBLEMS 9HRS

Second order equation involving a scalar-valued function – model equation – Variational formulation – Finite element formulation through generalised coordinates approach – Triangular elements and quadrilateral elements - convergence criteria for chosen models - Interpolation functions - Elements matrices and vectors - Assembly of element matrices -boundary conditions - solution techniques.

### **UNIT IV ISOARAMETRIC ELEMENTS AND FORMULATION**

Natural coordinates inn 1, 2 and 3 dimensions – use of area coordinates for triangular elements in - 2 dimensional problems – Isoparametric elements in 1,2 and 3 dimensional – Largrangean and serendipity elements – Formulations of elements equations in one and two dimensions - Numerical integration.

### UNIT V APPLICATIONS TO FIELD PROBLEMS IN TWO DIMENSION

Equations of elasticity – plane elasticity problems – axis symmetric problems in elasticity Bending of elastic plates -Time dependent problems in elasticity - Heat - transfer in two dimensions - incompressible fluid flow.

### **Total No. of Hours :45**

# **TEXT BOOKS**

1. J.N.Reddy, "An Introduction to Finite Element Method", McGraw-Hill Book Co., Intl. Edition, 1985. REFERENCES

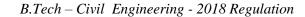
- *I.Rienkiewics*, "The finite element method, Basic formulation and linear problems", Vol.1, 4/e, 1. McGraw-Hill, Book Co.
- *S.S.Rao, "The Finite Element Method in Engineering", Pergaman Press, 1989. 2.
- 3. *C.S.Desai and J.F.Abel, "Introduction to the Finite Element Method", Affiliated East West Press 1972

### 8HRS

### **10HRS**



Subject Code		Subject No		Depa	tinent	of Civil	Engine	cring	TY/	L	Τ/	P/ R	С
Subject Code		Subject Na	ame						Lb/	L	I / S.Lr	-	C
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		Prerequisit							Ту	3	0/0	0/0	3
L : Lecture T :	Tuto	rial SLr :	Supervis	ed Learr	ning P:	Project	R : Res	earch C	: Credi	ts			
T/L/ETL : The	eory/L	ab/Embed	ded Theor	ry and L	ab								
OBJECTIVE													
		knowledge					ion, indu	istrialise	ed cons	tructi	on and d	esign of	
<b>A</b>		ed element			n method	ds.							
COURSE OU The student sh			s):(3-5	)									
CO1			me of the	prefabri	cated ele	ements							
CO2		design some of the prefabricated elements         Understand the construction methods in using prefabricated elements											
CO3		utilize the					01						
Mapping of C	Course			<u> </u>		<u> </u>	<u> </u>						
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COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO	) ]	PO10	PO11	PO12
CO1	H	H	Н	Н		Н		M				Μ	М
CO2	H	Н	Н	Н		Н		Μ				Μ	М
CO3	H	Н	Н	Н		Н		Μ				Μ	Μ
COs / PSOs	]	PSO1	PSO	02				-1					
CO1	H		Н										
CO2	Н		Н										
CO3	H		Н										
H/M/L indica	tes St	rength of	Correlati	on H-	High, N	M- Med	ium, L-	Low					
								ii					
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		es	Humanities and Social Sciences					Internships / Technical Skill					
Category		Engineering Sciences	So		es		ct	chn.					
	es	Sci	and	e	ctiv	/es	oje	Te					
	Basic Sciences	ing	les :	Program Core	Program Electives	Open Electives	Practical / Project	/ sd	S				
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- 1. CBRI, Building materials and components, India, 1990
- 2. Gerostiza C.Z., Hendrikson C. and Rehat D.R., Knowledge based process planning for construction and manufacturing, Academic Press Inc., 1994

# REFERENCES

- 1. Koncz T., Manual of precast concrete construction, Vols. I, II and III, Bauverlag, GMBH, 1971.
- 2. Structural design manual, Precast concrete connection details, Society for the studies in the use of precast concrete, Netherland Betor Verlag, 1978.

Dr.M.G.R. Educational and Research Institute (DEEMED TO BE UNIVERSITY) (An ISO Certified Institution) University with Graded Autonomy Status Maduravoyal , Chennai - 600 095

# **Department of Civil Engineering**

Subject	Subject Title :	Ty/Lb/ETL	L	<b>T</b> /	<b>P</b> /	С
code:				S.Lr	R	
BCE18E20	PRE FABRICATED STRUCTURES					
		Ту	3	0/0	0/0	3

# UNIT I INTRODUCTION

 $Need \ for \ prefabrication-Principles-Materials-Modular \ coordination-Standardization-Systems-Production-Transportation-Erection.$ 

# UNIT II PREFABRICATED COMPONENTS

Behaviour of structural components – Large panel constructions – Construction of roof and floor slabs – Wall panels – Columns – Shear walls.

# UNIT III DESIGN PRINCIPLES

Disuniting of structures- Design of cross section based on efficiency of material used – Problems in design because of joint flexibility – Allowance for joint deformation.

# UNIT IV JOINT IN STRUCTURAL MEMBERS

Joints for different structural connections – Dimensions and detailing – Design of expansion joints.

# UNIT V DESIGN FOR ABNORMAL LOADS

Progressive collapse – Code provisions – Equivalent design loads for considering abnormal effects such as earthquakes, cyclones, etc., - Importance of avoidance of progressive collapse.

Total No. of Hours:45

9HRS

### 9HRS

# 9HRS

# 9HRS .