# Walchand College of Engineering, Sangli

(Government Aided Autonomous Institute)



## **Course Contents (Syllabus) for**

Second Year B. Tech. (Civil Engineering) Sem - III to IV

## AY 2020-21

Title of the										]	L	Т	Р	Cr
Fluid Mecha	anics (5	CV202	<u>2)</u>							,	2	1	0	3
Pre-Requis	ite Cou	irses: I	Engine	ering P	hysics	, Engi	neering	g Mech	anics a	nd Mat	hema	tics		
Textbooks:														
	ısal R.K v Delhi				uid me	chanic	s and h	ydraul	ic mac	hines",	Laxn	ni Pub	lications (	P) Ltd.,
2. Gar	de- Mii	ajgaon	kar, "E	Enginee	ering F	luid M	echani	cs", SC	TECH	I Publi	catior	n,1 <sup>st</sup> E	dition, 20	10.
	diP.M. 1se Sinc					s and F	luid M	echani	es", Sta	andard	Book	Hou	seStandar	d Book
References	:													
1. Kur	nar D.S	5., "Flu	id Mec	hanics	and Fl	uid Po	wer Er	ngineer	ing", K	LatariaS	S K an	d Sor	s, 2 <sup>th</sup> Edit	ion, 2010.
			d Mec	hanics	Includ	ing Hy	/drauli	c Macl	nines",	Khanı	na Pu	blishe	rs, New	Delhi, 8th
	tion, 20		W/1:-	гр "	T1	<b>A</b> - 1	.:	A.C.		NT X	71 (	)4L T -	:4: 100/	-
			w ylie	Е.В.	riuia l	viecnai	ncs <sup>-</sup> , I	vicGrav	м HIII,	INEW Y	ork, 8	sin Ec	ition,198	).
Course Ob	-		dant f	Indone	ontolo -	`t tl··: 1	meat	niac						
	provide provide								in the	field of	f fluid	mech	nanics. Th	e students
she	Il be pro	ovided	with n	ecessar	y skills	s for flo	ow and	l losses	of wat	er distr	ibutic	n pip	e flow sys	
3. To	prepare	the stu	dents f	for high	ner stud	dies an	d resea	urch in	the fiel	d of flu	iid me	chani	cs.	
Course Lea	arning	Outcor	nes:											
СО	Aftor	tha aa	mnlati	on of th		a tha	atudan	t should	i ha ah	la to		Bloo	m's Cogr	itive
co	Alter		mpien		ie coui	se uie	studen	t should			L	evel	Des	criptor
CO1	expla	<i>in</i> the t	fundam	nentals	of flui	d mech	anics				]	,2	remem unders	bering, tanding
CO2				ge of f d at re				mecha	nics to	solve		3,4	applyii ,analyz	
CO3	estim	ate the	differe	ent loss	ses and	flow i	n pipe	flow sy	stem			5	Evalu	ate
СО-РО Ма	apping	: (Use	1, 2, 3	as Cor	relatio	on Stre	engths	)						
РО	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
CO1	2												1	1
CO2		3											2	2
CO3			3										3	2
Assessment Teacher As		nt:												
Two compo Semester Ex											tion (N	ASE)	and one E	Ind
		Asses	sment							Ι	Mark	5		
		ISI	E 1								10			
		151	51								10			

MSE	30	
ISE 2	10	
ESE	50	
ISE 1 and ISE 2 are based on assignment/declared test/	quiz/seminar etc.	
MSE: Assessment is based on 50% of course content (1	Normally first three modules)	
ESE: Assessment is based on 100% course content with three modules) covered after MSE.	n60-70% weightage for course content (normally	/ last
Course Contents:		
Module 1: Fluid Properties and Statics		Hrs.
Scope and importance of Fluid Mechanics, Physical volume, specific gravity, dynamic and kinematic vis capillarity and Vapor pressure.		
The basic equation of hydrostatics, Pascal's law, Cor gauge pressure, Measurement of pressure, Application		5
Principle of floatation and Buoyancy, Equilibrium of floatation	oating bodies, Stability of floating bodies.	
Module 2: Fluid Kinematics		Hrs.
Introduction of basic terms: Path line, streak line, acceleration of fluid particle.	stream line and stream tube, Velocity and	
Types of flow: steady and unsteady, uniform and not	n-uniform, Laminar and Turbulent, one, two,	•
three-dimensional flow, rotational and irrotaional flow	<i>.</i>	3
Flow net: Equation of stream line and equipotential	line, methods of developing the flow net and	
its uses.		
Module 3:Fluid Dynamics		Hrs.
Forces acting on fluid mass in motion, Euler's ed Bernoulli's equation: assumptions, applications and application in fluid mechanics. Applications of Bernoulli's Equation: Analysis of t	its limitations. Momentum equation and its	6
measuring devices: orifices, mouthpieces, venturimete		
losses in closed and open channel flow.		
Module 4: Flow in Pipes		Hrs.
Laminar Flow: Reynolds's Experiment, laminar flow the Hazen Poiselle's equation for circular pipes.	nrough fixed parallel plate ,Coutte's flow and	
Turbulent Flow: Velocity distribution and shear stresse Elementary concepts of turbulent flow in smooth and re	<u>^</u>	5
Losses in Pipes: Losses in Pipes: Darcy Weisbach equa Concept of equivalent length of pipe and diameter of pi	0 1 1	5
Analysis of losses in pipe for the pipes connected in se reservoir problem, three-reservoir problem and Pipe N		
Module 5: Boundary Layer Theory		Hrs.
Concept of boundary layer, Development of boundary and lift of submerged bodies, Hydro dynamically sm		3

Title of t Building			Cons	tructi	on (5C)	V203)				-	L 3	Т	Р	C 3
Pre-Req						<u>, </u>					3	-	-	3
Textbool			111											
	кs: R. K. Raj	nut "F	nginee	oring N	Anterial	s" S (	<sup>-</sup> hand I	Publics	tions 1	New De	1hi 20	014		
		-	-	-									ni Public	ations, 5 <sup>th</sup>
E	Edition, 2	2005.							-				in i uone	ations, 5
3. E	Bindra ar	d Aror	a, "Bu	ilding	Constr	uction"	, Dhanj	oat Ra	i and So	ons, 199	97.			
Referenc	es:													
1. P	P. C. Var	ghese, ,	,Build	ing M	aterials	" PHI I	Learnin	g, East	ern Ec	onomy l	Editio	n, 2 <sup>nd</sup> H	Edition, 2	2015.
2. S	S. K. Dug	ggal "B	uilding	g Mate	erials" N	New Ag	ge Inter	nation	al, 3 <sup>rd</sup> E	Edition,	2008,			
	Birdie an 2012	d Ahuja	a, "Bu	ilding	Constru	action a	and Cor	nstruct	ion Ma	terials",	Dhar	npat Ra	ai and Sc	ons, 4 <sup>th</sup> Edition
Course (	Objectiv	es : To	impa	rt to t	he class	5,								
2. tl b	he role p puilding he repres	layed b as a who sentatio	y vario ole. n of b	ous bu	ilding o	compor	nents ar	d thei	r intera	ctions fo	or an i	integra	g Constr ted beha	uction. vior of the
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CO1	mat per con	erials b standa	by asse ards, ts in co	essing and <u>i</u> ontext	and co <i>nterpre</i>	mparin <u>t</u> their	ig the c appli	luality	param	ouilding eters as ouilding	2	2, 3	Unders	tand Apply
CO2	<u>Cla</u> bui ma bui to	<u>ssify</u> t ldings erials a lding co	he va of di and com ompon	rious ifferer nstruc ents a	compo t struc tion tec nd syst	nents ctural hniques cems	and th system s to be	s and adopte	<u>ident</u> ed for d	hips in <u>ify</u> the lifferent efficier	2,	3, 4		rstand Apply Analyze
CO3		<u>strate</u>	the	vario	ous bu	uilding	com	ponent	s in	terms		3	App	ly
CO-PO	Mappin	g :									1	I		
РО	1	2	3	4	5	6	7	8	9	10	11	12	PSO 1	PSO 2
CO1		3					1						2	2
CO2			3				1						2	]
CO3			2										2	

	Course										L	Т	Р		Cr
<b>Engineerin</b>	g Geolog	gy (5C	CV204)								2	-	-		2
Pre-Requis	ite Cour	ses: N	il												
Textbooks:															_
1. K. M Dell	-	ar.,"Pri	nciples	of Eng	gineerin	ıg Geol	ogy", S	Standaro	d Publi	shers D	istrib	utors 1	705-B N	ai Sa	ırak,
	Chenna H d Darya				of Eng	ineerin	g Geol	ogy",M	acmilli	ian Indi	a Ltd	. 2/10	Ansari		
3. Part	oin Singl	h, "Eng	gineerin	g and (	General	l Geolo	gy", S.	K. Kat	ariya a	nd Son	s, Del	hi.,198	84, 1 <sup>st</sup> Ed	ition.	
<b>References</b> :															
1. Sub	inoy Ga	ngopad	lhy, "Eı	ngineer	ring Ge	ology",	Oxfor	d Unive	ersity P	ress, N	ew D	elhi, 20	017, 5 <sup>th</sup> E	ditio	n.
2. A. H	Iolmes,	"Princi	ples of	Physic	al Geo	logy", l	ELBS (	Chapma	in and I	Hall, L	ondor	ı.			
	D. V. Re , New D	-	-	-		for Civ	vil Engi	neering	g", Oxf	ord and	I IBH	Publis	hing Co.	Pvt.	
Course Obj	ectives	:													
1. Intro	oduce st	udents	the nec	essary	knowle	edge an	d conce	epts in t	he field	d of geo	ology	and to	develop	the	
	se of Eng	-	•		U U	Ũ		•							
2. Intro			ique of	recogi	nizing,	classify	ving an	d descri	bing v	arious g	geolo	gicalev	vent and		
pher	nomena.														
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Proj	ect.	ents to		and ge	ologica	l probl	em bef	ore und	ertakin	g any c	vivil e	nginee	ring		
Proj	ect. rning O	ents to Outcom	les:		_	_					vivil e		-	itive	
Proj	ect. rning O	ents to Outcom	les:		_	_		ore und				Bloon	ı's Cogn		
Proj Course Lea	ect. rning O After	ents to Putcom the cor	n <b>es:</b> mpletio	n of the	e course	e the stu	udent s	hould b	e able				ı's Cogn	itive cript	or
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Proj Course Lea CO CO1	ect. rning O After Descr physic Geolo Descr prelin Use th	<i>Putcom</i> the cor <i>tibe</i> the cal geo ogy. <i>tibe</i> and ninary g	n <b>es:</b> npletio geolog logy, m d <i>explan</i> geologi	n of the	e course benome ogy, per urface a estigati	e the str na espe trology. and sub ons. <i>recogn</i>	udent s cially i struction osurfaction <i>ize</i> and	hould b n the fi ural e metho <i>identif</i>	e able eld of			Bloon evel 2	r's Cogn Des Under	cript stand	ding ding
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Proj Course Lea CO CO1 CO2 CO3	ect. rning O After Descr physic Geolo Descr prelin Use th geolo	<i>putcom</i> the cor <i>ibe</i> the cal geo ogy. <i>ibe</i> and ninary g	nes: mpletio e geolog logy, m d <i>explai</i> geologi wledge	n of the	e course benome ogy, per urface a estigati	e the str na espe trology. and sub ons. <i>recogn</i>	udent s cially i structionsurfactor <i>ize</i> and	hould b n the fi ural e metho <i>identif</i>	e able eld of			Bloon evel 2 2	n's Cogn Des Under Under	cript stanc stanc plyin	ding ding ng
Proj Course Lea CO CO1 CO2 CO3 CO-PO Ma	ect. rning O After Descr physic Geolo Descr prelin Use th geolo pping :	<i>Putcom</i> the cor <i>ibe</i> the cal geo ogy. <i>ibe</i> and ninary gical pl	npletio geolog logy, m d <i>explan</i> geologi wledge henome	n of the gical phi ineralo in the s cal inv of geol ena and	e course enome ogy, pet urface a estigati logy to <i>apply</i>	e the str na espe trology, and sub ons. <i>recogn</i> in civil	udent s cially i , struction surface <i>ize</i> and engine	hould b n the fi ural e metho <i>identif</i> eering.	e able eld of ds of	to		Bloon evel 2 2 3	n's Cogn Des Under Under	cript stanc stanc plyin	ding ding ng
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Proj Course Lea CO CO1 CO2 CO3 CO-PO Ma PO CO1 CO2	ect. rning O After Descr physic Geolo Descr prelin Use th geolo pping : 1 2 2 2	ents to Putcom the cor <i>ibe</i> the cal geo pgy. <i>ibe</i> and ninary g ne know gical pl 2	nes: npletio geologi logy, m d <i>explan</i> geologi wledge henome <b>3</b>	n of the sineral of geological involution of geological and	e course benome bgy, per urface a estigati logy to lapply 5	e the str na espe trology, and sub ons. <i>recogn</i> in civil	udent s cially i , struction surface <i>ize</i> and engine	hould b n the fi ural e metho <i>identif</i> eering.	e able eld of ds of y 9 1	to 10 2		Bloon evel 2 2 3	r's Cogn Des Under Under Ap PSO 1 2	cript stanc stanc plyin	ding ding ng PSO2 2 2

Two components of In Semester Evaluation (ISE), One Mid Semester Examination (MSE) and one End Semester Examination (ESE) having 20%, 30% and 50% weights respectively.

Assessment	Marks
ISE 1	10

Engineerii	ig Surve	eving (	<u>50 V 2</u>	<u>05)</u>											
												3	-	-	3
Pre-Requi		irses: I	Nil												
2. N. De	C. Punn N. Basa lhi.	k, "Sur	veying	g and L	evellir	ıg", Ta	ita Mcg	raw H	ill Edu	cation ]	, 17 <sup>th</sup> edit Pvt. Ltd, 2	2 <sup>nd</sup> Edit			
3. K.		a "Surv	eying	, Vol.	1 & 2,	Stand	ard Bo	ok Hou	ise, 16	editio	on, 2018, 1	Kota.			
<ol> <li>Du</li> <li>Ba</li> <li>R.</li> </ol>	ggal S. 1 nnister a	ind Ray s, F. Fo	ymond oote an	l, "Surv	eying"	, ELB	S, Long	gman (	Group	Ltd., Ei	ition, 201 1gland. ⁄IcGraw I				
Course Ob	jectives	:													
3. То	develop nciples i	an abi n planı	lity to ning a	analyz	e land	profile	es in log	gical m	anner	and wil	e mapping Il be able 1's surface	to appl		•	stood
00	After	41		on of 41				4 ah ar 1	d 1. a al	1. 4.0		Bl	oom's C	ogni	tive
CO	Alter	the co	mpieu	on of th	ie cour	se the	studen	t snoui	d be at	ble to		Leve	l D	escri	ptor
CO1				edge to oject ai				urveyii	ng tech	niques	suitable	3	A	Apply	ving
CO2	the to		hical							•	, random	4	A	nalyz	zing
	errors											2			
CO3		eive mo	odern s	urveyii	ng equi	ipment	t and te	chniqu	es			2	Unc	lersta	inding
	Perce		odern s	surveyii	ng equi	ipment	t and te	chniqu	es			2	Unc	lersta	nding
CO-PO M PO	Perce apping		odern s	surveyin	ng equi	ipment 6	t and te	chniqu 8	es 9	10	11	12	PSO1		PSO2
CO-PO M PO CO1	<i>Perce</i> apping	2		-	5	^	1	-	9	10	11		<b>PSO1</b>		<b>PSO2</b> 1
CO-PO M PO CO1 CO2	Perce apping	:		-	<b>5</b>	^	1	-	1	10	11		PSO1		PSO2 1 1
CO-PO M PO CO1 CO2 CO3	Perce	2		-	5	^	1	-	9	10	11		<b>PSO1</b>		<b>PSO2</b> 1
CO-PO M PO CO1 CO2 CO3 Assessmen	Perce	<b>2</b> 2		-	<b>5</b>	^	1	-	9	10	11		<b>PSO1</b>		<b>PSO2</b> 1 1
CO-PO M PO CO1 CO2 CO3 Assessmen Feacher A	Perce	: 2 2 nt: f In Se	3 mester	4 Evaluation	5 1 3	6	7	8 d Seme	9 2 ester E			12	<b>PSO1</b> 1 1		<b>PSO2</b> 1 1 1 1
CO-PO M PO CO1 CO2 CO3 Assessmen Feacher A	Perce	: 2 2 nt: f In Se	3 mester g 20%	4	5 1 3	6	7	8 d Seme	9 2 ester E			<b>12</b> E) and	<b>PSO1</b> 1 1		<b>PSO2</b> 1 1 1 1
CO-PO M PO CO1 CO2 CO3 Assessmen Feacher A	Perce	2 2 nt: f In Se b having	3 mester g 20% sment	4	5 1 3	6	7	8 d Seme	9 2 ester E		tion (MS	<b>12</b> E) and	<b>PSO1</b> 1 1		<b>PSO2</b> 1 1 1 1
CO-PO M PO CO1 CO2 CO3 Assessmen Feacher A	Perce	2 2 nt: f In Se having Assess	3 mester g 20% sment E 1	4	5 1 3	6	7	8 d Seme	9 2 ester E		tion (MS	<b>12</b> E) and	<b>PSO1</b> 1 1		<b>PSO2</b> 1 1 1 1
CO-PO M PO CO1 CO2	Perce	2 2 mt: f In Se having Assess ISE	3 mester g 20% sment E 1 SE	4	5 1 3	6	7	8 d Seme	9 2 ester E		tion (MS Marks 10	<b>12</b> E) and	<b>PSO1</b> 1 1		<b>PSO2</b> 1 1 1 1

Title of the Solid Mech			<u>6)</u>									L 2	T 1	P 	Cr 3
Pre-Requis	ite Cou	rses: E	nginee	ring M	echanic	cs					<u> </u>				
2. Pop	beler R. ov E. B. e and Ti	, "Mec	hanics	of Mat	terials"	, Pearso	on Educ	cation,	2 <sup>nd</sup> Edi	tion, 20	)15.				
References			-				-	1							
<ol> <li>And</li> <li>Tim</li> </ol>	r and Jo rew Pyt oshenko lication,	el and 5. S. &	Jaan K Young	iusalaa g. D. H	ıs, "Me	chanics	of Ma	terials"	, Ceng	age Lea	arning,	USA,	2 <sup>nd</sup> Ec		2011.
<ol> <li>To i</li> <li>To j and</li> </ol>	mpart th llustrate provide design a	ne basic intern the kno aspects	al effect owledge of stru	ets and ets of sta	deforn bility a	nations malysis	caused	by the	variou	••			the ar	nalysi	S
Course Lea	rning C	Outcom	nes:												
CO	After	the con	mpletio	on of th	e cours	se the st	udent s	should l	be able	to		Bloom	-	gnitiv Descr	
C01	<b>Expla</b> bodie		e of str	ess-stra	ain and	interna	al force	s in ela	stic			2			anding
CO2	Solve	proble	ems on	structu	res to f	ind inte	ernal fo	rces.				3		Appl	ying
CO3	Analy	yze dif	ferent s	tresses	in stru	ctural r	nember	ſS.				4		Analy	zing
CO-PO Ma	pping :	-	-	-					-						
PO	1	2	3	4	5	6	7	8	9	10	11	12	PS	01	PSO2
CO1 CO2	2	3													2
CO2 CO3	2	3													2
Assessment Assessment	•			1											
Two compo Examination										ninatio	n (MSE	E) and	one E	nd Se	mester
		Asses	sment								Mark	5			
		ISI	E 1								10				
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Fluid Mee	hanics La	horotor	w (5CX											
	mannes La	001 ator	<u>y (30 (</u>	(252)							0	0	2	1
Pre-Requi	isite Cours	ses:												
Engineerin	ng Physics	, Fluid N	Aechan	ics										
Textbooks	5:													
Ed 2. As	ngarajuK. lition,1993 swa G.L., ' khi, S.K., '	'Experin	nental I	Fluid N	/lechani	cs", Vo	ol. I & 1	II, Nem	Chano	1 & Bro	os., Roo	orkee,1°	<sup>st</sup> Edition	,1983.
Reference	s:													
2. Su Co	odi P.M. a Ibramanya o., Ltd., 7 <sup>th</sup> enTe Chow	K.,"The Edition2	ory and 000.	d Appl	ications	of Flu	id Mec	hanics'	' Tata I	McGrav	w Hill I	Publishi	ing	013.
1	-	vide stud		ands-o	n practi	ce for	measur	ement (	of visco	osity, p	ressure	and dis	scharge b	y using
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Title of the Course:	L	Т	Р	Cr
<b>Building Materials and Construction Laboratory (5CV253)</b>	-	-	2	1

Pre-Requisite Courses: Exposure to theory course in Building Materials and Construction

#### **Textbooks:**

- 1. M L Gambhir; Neha Jamwal, Building and Construction Materials: Testing and Quality Control, Tata McGraw-Hill Education, 2014
- 2. Mantri Institute"s "The A to Z of Practical Building Construction and its Management" Mantri Institute of Devp. and Research. Pune, Published by Satya Prakashan, 2011

#### **References:**

- 1. Shetty M. S., "Concrete Technology", S. Chand & Company Ltd. New Delhi, 7th Edition, 2013.
- 2. IS 3495, IS 1077, IS 2386, IS 383, Bureau of Indian Standards, New Delhi.
- 3. Material Testing-lab-manual.pdf: http://site.iugaza.edu.ps/mymousa/files/Material\_-Testing-lab-manual.pdf

#### **Course Objectives :**

- 1. To involve students in hands on laboratory activities to evaluate the properties of basic construction materials.
- 2. To engage students in visits to ongoing construction sites to appreciate/relate the classroom learning"s and also get an exposure to new developments in the construction industry.
- 3. To update students about the perennial changing costs and quality of building materials through market surveys.

Cours	e Learniı	ng Outc	comes:											
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Enginee	ering Geolog	y Labor											_	1
Pre-Req	uisite Cours	ses:												
Textboo														
	K. M. Banga Delhi	r.,"Princ	ples o	f Engiı	neering	Geolo	gy", St	andard	Publis	ners Di	stributo	ors 170:	5-B Nai S	Sarak,
	N. Chenna K Daryanganj,	-		book o	f Engir	neering	Geolog	gy", Ma	acmillia	an India	a Ltd. 2	/10 An	sari Road	1
3. 1	Parbin Singh	, "Engin	eering	and G	eneral (	Geolog	y", S. ŀ	K. Kata	riya an	d Sons,	Delhi,	1984,	1 <sup>st</sup> Editio	n.
Referen	ces:													
1. 1	M. S. Krishn	an, "Geo	ology o	f India	and B	urma",	CBS P	ublishe	rs & D	istribut	ors			
2.	A. Holmes, "	Principl	es of P	hysical	l Geolo	gy", El	LBS Cl	hapmar	and H	all, Loi	ndon.			
	Dr. D. V. Re New Delhi, 1				ology fo	or Civil	Engin	eering'	', Oxfo	rd and	IBH Pu	blishin	g Co. Pv	t. Ltd.,
Course	<b>Objectives</b> :													
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1.	Mrinalini Pa	ande, "I	Disaster	Mana	gement	t", Wile	y Publ	ications	s New 1	Delhi, I	First o	edition,	2014		
2.	N.K Uberoi	, "Envi	ronmen	tal Stu	dies", I	Excel B	ooks P	ublicati	ions Ne	ew Dell	hi, fir	st editio	on, 2005		
3.	R.Rajagopa edition, 201		nvironn	nental	Studies	s from o	crisis to	o cure"	Oxfor	d unive	ersity	press,	second		
Refere	nces:														
1.	William. Cu Concern", V	•					•			ental S	cienc	e:	AO	Glob	al
2.	Peter. H. R publication,				rg, Ge	eorge. I	3.	Joh	nson, ''	Enviro	nmer	nt", Mc	Graw Hi	11	
3.	Catherine A Springer Pu		-		nley (F	Editors)	, "Adaj	otive Ei	nvironr	nental	Mana	igemen	",		
Course	Objectives														
Course	Objectives	:													
1.	Infuse an un Engineering Provide a for managemen	nderstar and te oundati	chnolog	gy. priticall	y asses	ss the a	pproac	hes to	polluti	on con	trol, e	environ	mental a	and :	resourd
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## Proposed Syllabus for S.Y.B.Tech (All branches)

## **Course: Probability and Statistics (5MA201)**

## Year: 2020-21

(4)

## Discrete random variable, Continuous random variable, probability mass function, cumulative distribution function, bivariate discrete random variable, joint probability distribution, joint distribution function of two dimensional discrete random variable. Module 2: Probability Distribution: (4) Gaussian distribution, Exponential distribution, Uniform distribution. **Module 3: Statistical Methods:** (5) Measure of Central tendency, Measure of dispersion, Range, Quartile deviation, Mean deviation, variance, Standard deviation, Coefficient of variance, moments, Symmetry, Skewness, Kurtosis, and Types of Kurtosis. Module 4: Population and Sample: (3) Introduction, Types of Characteristics: Attributes and variables, Collection and Organization of data, Population and sample, Methods of sampling. Module 5: Exact Sampling Distribution: (4) Chi- square distribution: definition and its properties, Student t- distribution: definition and its properties. (7)

## Module 6: Test of Hypothesis:

Module 1: Random Variable:

Random samples, parameter, statistic, standard error of statistic, null and alternative hypothesis, critical region, level of significance, Types of error, large sample test, Small sample test.

## **References Book:**

(1) Probability and Statistics for Engineers and Scientists by S.Ross.

## Text books:

(1) Fundamental of Mathematical Statistics by Gupta and Kapoor.

(2) An Introduction to probability and statistics by Vijay Rohatgi.

Title of the Course:	L	Т	Р	Cr
Applied Mathematics (5MA202)	2	-	-	2

**Pre-Requisite Courses:** Engineering Mathematics I and Engineering Mathematics II

## **Textbooks:**

- Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Eastern Limited Publication, 1978, 1<sup>st</sup> Edition.
- 2. P. N. and J. N. Wartikar, "A Text Book of Applied Mathematics, Vol I and II", Vidyarthi Griha Prakashan, Pune, 2006.
- 3. B.S. Grewal, "Higher Engineering Maths", Khanna Publication, 2005, 39th Edition

## **References:**

- 1. Wylie C.R., "Advanced Engineering Mathematics", Tata McGraw Hill Publication, 1999, 8<sup>th</sup> Edition.
- 2. H. K. Dass, "Advanced Engineering Mathematics", S. Chand & Company Ltd., 1988, 1<sup>st</sup> Edition

## **Course Objectives :**

- 1. To develop mathematical skills and enhance thinking power of students.
- 2. To introduce fundamental concepts of mathematics and their applications in engineering fields

Course Le	arning	Outco	mes:											
CO	After	the co	ompleti	on of	the cou	arse the	e stude	ent sho	uld be	able	I	Bloom	"s Cognit	tive
CO	to		I								Lev	vel	Descr	iptor
CO1	Expl	ain ma	themat	tical co	oncepts	s in eng	gineeri	ng fiel	d.		2	2	Underst	anding
CO2			natical science		-			ods to s	olve tl	ne	3	5	Appl	ying
СО-РО М	apping	:												
PO	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
CO1	2													
CO2	2													
Assessmer	nts : Te	acher	•											
Assessmen	nt:													
Two comp	onents o	of In S	emeste	r Eval	uation	(ISE),	One N	/lid Sei	mester	Exam	inatior	(MSI	E) and on	e End
Semester E	Examina	tion (E	ESE) ha	aving	20%, 3	0% an	d 50%	weigh	ts resp	ective	ly.			

Assessment	Marks
ISE 1	10
MSE	30
ISE 2	10
ESE	50

Hydraulics	Course	e:								I		Т	Р	Cr
	and Hy	ydraul	lics Ma	chine	ry (5C)	V221)					3	0	0	3
Pre-Requisi	ite Cou	rses: 1	Fluid N	Iechan	ics									
Textbooks:														
	garajuk ion, 19		Flow in	n Open	Chann	els", T	ata Mc	Graw	Hill Pu	blicatio	on Co.	Ltd.,I	New Dell	i, 1 <sup>st</sup>
2. Moc		and S		И., "Ну	draulio	cs and I	Fluid N	/lechar	ics", S	tandarc	l Book	2		
3. Ven	· ·		,	annel H	Iydraul	ics", T	ata Mc	Graw	Hill Pu	blishin	g, 1 <sup>st</sup>	Editio	n, 2000.	
<b>References:</b>	:													
<b>2.</b> Cha		The Hy	draulic	es of O	pen Ch	annel l	Flow a	n Intro	duction	ı", Wil			n, 2009 on, 2004	
Course Obj	ectives	:												
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Course Lea	rning (	Outcor	mes:											
СО	After	the co	mpleti	on of th	ne cour	sa tha i	tudent	should	l ba ab	la to		Bloo	m's Cogi	itive
CO	Alter	the co	mpien			se the s	studelit	siloui			Lev			riptor
CO1	-				asic co	•	•				1,2	/	Remembe Understa	nding
CO2					sic equa gy dissi				el flow	<sup>,</sup> for	3,4	4		lying, lyzing
CO3	analy	ze the	perfor	mance	and wo	orking	of pum	p and	turbine		5		cre	ating
CO-PO Ma	pping :	: (Use	1, 2, 3	as Coi	relatio	n Stre	ngths)					1		
PO	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
CO1	2												1	1
CO2		2											2	2
			3										3	3
CO3														
Assessment		nt:												
Assessment	sessme		mester	Evalua	ation (I	SE), O	ne Mic	l Seme	ster Ex	aminat	ion (N	ISE) a	nd one E	nd
Assessment Teacher As Two compo	sessme	f In Se									ion (N	ISE) a	nd one E	nd
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Pre-Re	quisite C	ourses:	Expos	ure to I	Building	g Matei	rials an	d Const	truction	1					
<b>Fextbo</b>	ooks:														
1.	Kumars 2010	swamy	and Ka	meshw	ar Rao.	, "Buil	ding Pl	anning	and De	esign," (	Charota	r Publ	ications, 8	8 <sup>th</sup> Edit	tion,
2.	V. B. S	ikka, Ci	ivil Eng	gineerin	ng Drav	ving, S	. K. Ka	taria an	d Sons	, 7 <sup>th</sup> Ed	ition, 20	015			
Refere	nces:														
1.	Pierce S Edition		and, Pla	anning:	The A	rchitect	's Hand	dbook "	,E. & C	)E", Ilif	fe Bool	cs Ltd.	London,	1963,	8 <sup>th</sup>
2.	John Ha New Yo			der, Jos	eph De	Chiara	ı, "Tim	e Saver	: Stand	ards for	Buildi	ng Typ	es", McC	braw- H	Hill,
3.	Nationa Delhi, 2		ing Co	de of In	idia 20	16 (NB	C 2016	i) Volui	me 1 ar	nd 2, Bu	reau of	India	n Standaro	ds, Nev	N
Course	e Objecti	ives : T	'o make	e the cla	ass kno	wledge	able by	sharin	g						
1.	Concep	ts in Bu	uilding	Plannir	ng and t	function	nal des	ign.							
2.	Integrat	ion of a	aestheti	ical con	cepts a	nd influ	lence o	of clima	te in b	uilding	design.				
3.	The art	of expr	essing	buildin	gs in te	rms of	drawin	gs.							
Cours	e Learni	ng Out	comes												
							. 1		11 .			I	Bloom's (	Cogniti	ive
CO	After th											Lev	vel I	Descrij	otor
CO1	Perceiv function Laws/re	nal aspe	ects and	ł <u>apply</u>	the prin	nciples	of plan	ning, b		s of stru	ctural,	2,	3 U	Unders Appl	
CO2	Practic climato						gs, in r	elevanc	e to bu	ilding s	ervices	' 3		App	ly
CO3	<u>Design</u> <u>Illustra</u>			-	-				-			3,	6	App Crea	•
CO-P(	) Mappi	ng :													
PO	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	F	PSO2
		3											1		
CO1															
CO1 CO2			3				2						1		

CO2: is mapped only to PO 3 (strongly) as this outcome caters the candidate to exhibit his/her knowledge

	tle of the											L	Т	Р		Cr
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Pro	e-Requisi	te Cou	rses:													
Те	xtbooks:															
1. 2. 3.	S.K. Ga Delhi,15 M.J. Dec S.K. Ga publishe	<sup>oth</sup> editio odhar, ' org, ''V	on (201 " Elem Vater r	10) entary esourc	Engine es En	eering l gg. Vo	Hydrol	ogy", I	Pearson	1 Educa	ation, 1	<sup>st</sup> Edit	ion(2	009)	-	
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1. 2. Co	To impa To impa sustainal	ectives rt basic rt fund bility. rning ( After Expla syste Uesc types	the con ain bas ns, wa of min	ledge o ils of Ir <b>nes:</b> mpletio sic con- tershed revailin or irrig	of fund rigatic on of th cepts of l mana ng irr gation,	amenta on Engi ne cour of hydr gement igation govern	ll conce neering se the s ologic t. water ument 1	epts of g and v student cycle, r mana aws an	Engine vatersh t should aquife agemen	eering l ed mar l be ab rs, irrig at prac	Hydrol nageme le to gation ctices, y.	ogy. ent and	l their Bloo evel	relevar m's Co D Un	nce t ognit	to tive riptor
1. 2. <b>Co</b>	To impa To impa sustainal ourse Lea CO	ectives rt basic rt fund bility. rning ( After Expla system Descri types Anal	the contract of min yze prograph,	ledge o ils of Ir nes: mpletio sic con- tershed revailin or irrig recipita	of fund rigation on of the cepts of l mana ng irr gation, tion of	amenta on Engi ne cour of hydr gement igation govern data an	al conce neering se the s ologic t. water ument 1 nd sol	epts of g and v student cycle, r mana aws an <b>lve</b> pro	Engine vatersh t should aquife	eering l ed mar l be ab rs, irrig nt prac r polic: relate	Hydrol hageme le to gation ctices, y. ed to	ogy. ent and	l their Bloo evel 2	relevan m's Co Un Un	nce t ognit derst derst	to tive tiptor tanding
1. 2. <b>Co</b>	To impa To impa sustainal ourse Lea CO CO1 CO2	ectives rt basic rt fund bility. rning ( After Expla system Descri types Analy hydro yield.	the contract of mining of mining yze prograph,	ledge o ils of Ir <b>nes:</b> mpletio sic con- tershed revailin or irrig recipita aquife	of fund rigatic on of tl cepts of l mana ng irr gation, ition of ers, ir	amenta on Engi ne cour of hydr gement igation govern data an rigation	al conce neering se the s ologic t. water ument 1 n, wate	epts of g and v student cycle, c mana aws an <b>ve</b> pre- er requ	Engine vatersh t should aquifer agemer ad wate oblems	eering l ed mar l be ab rs, irrig nt prace r policy relate nt and	Hydrol hageme le to gation ctices, y. ed to	ogy. ent and	l their Bloo evel 2 2 3	relevan	nce t ognit derst derst derst	to tive tiptor tanding tanding
2. 20	To impa To impa sustainal ourse Lea CO CO1 CO2 CO3	ectives rt basic rt fund bility. rning ( After Expla system Descr types Anal hydro yield. Desig	the con ain bas ms, wa ribe p of min yze pr ograph, gn cana	ledge o ils of Ir <b>nes:</b> mpletio sic con- tershed revailin or irrig recipita aquife	of fund rigatic on of tl cepts of l mana ng irr gation, ition of ers, ir	amenta on Engi ne cour of hydr gement igation govern data an rigation	al conce neering se the s ologic t. water ument 1 n, wate	epts of g and v student cycle, c mana aws an <b>ve</b> pre- er requ	Engine vatersh t should aquifer agemer id wate oblems uiremer	eering l ed mar l be ab rs, irrig nt prace r policy relate nt and	Hydrol hageme le to gation ctices, y. ed to	ogy. ent and	Bloo evel 2 2 3 4	relevan	nce t ognit derst derst derst	to tive tiptor tanding tanding lying yzing
2. 20	To impa To impa sustainal ourse Lea CO CO1 CO2 CO3 CO4	ectives rt basic rt fund bility. rning ( After Expla system Descr types Anal hydro yield. Desig	the con ain bas ms, wa ribe p of min yze pr ograph, gn cana	ledge o ils of Ir <b>nes:</b> mpletio sic con- tershed revailin or irrig recipita aquife	of fund rigatic on of tl cepts of l mana ng irr gation, ition of ers, ir	amenta on Engi ne cour of hydr gement igation govern data an rigation	al conce neering se the s ologic t. water ument 1 n, wate	epts of g and v student cycle, c mana aws an <b>ve</b> pre- er requ	Engine vatersh t should aquifer agemer id wate oblems uiremer	eering l ed mar l be ab rs, irrig nt prace r policy relate nt and	Hydrol hageme le to gation ctices, y. ed to	ogy. ent and	Bloo evel 2 2 3 4	relevan	nce t ognit derst derst derst Crea	tive tive tanding tanding lying yzing ating
1. 2. Co	To impa To impa sustainal ourse Lea CO CO1 CO2 CO3 CO4 D-PO Ma	ectives rt basic rt fund bility. rning ( After Expla system Uesc types Analy hydro yield. Desig	the contract of mining of	ledge o ils of Ir <b>nes:</b> mpletio sic con- tershed revailin or irrig recipita aquifo	of fund rigatic on of tl cepts of l mana ng irr gation, ition of ers, ir	amenta on Engi ne cour of hydr gement igation govern data an rigation nd rain	al conce neering se the s ologic t. water nment 1 n, water n, water	epts of g and v student cycle, c mana aws an lve pre- er requ narvest	Engine vatersh t should aquifer agemer id wate oblems uiremer ing sys	eering l ed mar l be ab rs, irrig nt prace r polic; relate nt and tem.	Hydrol hageme le to gation ctices, y. ed to crop	ogy. ent and	I their Bloo evel 2 2 3 4 6	relevan	nce t ognit derst derst derst Crea	tive <b>iptor</b> tanding tanding lying yzing

CO4 Assessments :

CO3

Teacher Assessment:

3

3

Two components of In Semester Evaluation (ISE), One Mid Semester Examination (MSE) and one End Semester Examination (ESE) having 20%, 30% and 50% weights respectively.

2

2

2

2

Title of the	Course	:										L	Т	Р	Cr
Structural A	Analysis	s (5CV	<u>224)</u>									2	1		3
Pre-Requisi	te Cou	rses: So	olid M	echani	cs.							I			
Textbooks:															
1. Devd	as Men	on, "St	ructura	al Ana	lysis",	Alpha	Science	ce Intl, l	$Ltd., 2^{nc}$	<sup>1</sup> Editio	n, 2008	8.			
	it & Guj				lysis -	Matrix	k Appr	oach", T	Fata Mo	Graw-	Hill Pu	blish	ing Co	ompany	Ltd.,
	Delhi, 4														
	ikatti S					f Stru	ctural	Analysi	s", I. I	K. Inter	rnation	al Pu	ıblishi	ng	
References:	e Pvt. Lt	.a., 1 1	zanior	1, 2003	).										
1. Hibb	oeler R	С "М	echan	ics of ]	Materi	als" P	earson	Educat	ion 10 <sup>t</sup>	<sup>h</sup> Editio	n. 2016	<b>5</b> .			
2. Wea						-							ions a	nd	
	ributors					2				2					
3. Wan	ıg C. K.	, "Inde	termin	ate Str	uctura	l Anal	ysis", T	Гata Mc	Graw-H	Hill Pub	lishing	g Con	npany	Ltd., N	ew Delhi,
1 <sup>st</sup> E	dition, 1	1983.													
Course Obj	ectives	:													
1. To il	llustrate	conce	pt of s	tatic ar	nd kine	matic	indeter	rminacy	of stru	ctures.					
	rovide t							•			f vario	us str	ucture	s.	
3. To in	mpart th	ne knov	vledge	for an	alyzin	g deter	minate	e and in	determi	nate str	uctures	s by u	sing v	arious	
meth	nods.														
Course Lea	rning O	outcom	es:												
<u> </u>	After	the cor	npleti	on of t	he cou	rse the	stude	nt shoul	d be ab	e to		Blo	om's	Cogniti	ive
CO			I								1	Level		Descr	iptor
CO1	Perce struct		havior	of stat	ically	determ	ninate	and Ind	letermir	nate		2		Underst	anding
CO2		y var detern				of st iinate s			chanics	to		3		Appl	ying
CO3	Analy mech		<b>d</b> stru	ctures	using v	various	appro	aches ii	n Struct	ural		4		Anal	yzing
CO-PO Maj	pping :														
РО	1	2	3	4	5	6	7	8	9	10	11	12	P	SO1	PSO2
CO1	2	1													2
CO2	3	3													3
CO3	3	3												1	2
Assessments Assessment:		her													
Two compor Examination						-				minatio	on (MS	E) ar	nd one	End Se	emester
		Asses	sment	ţ							Mar	ks			
			E 1								10				
		10									10				

Title of the										Ι	Ĺ	Т	Р	Cr
Concrete T				_						4	2	-	-	2
Desirable (	Courses	s: Bui	lding N	<i>l</i> ateria	ls and	Constr	uction.							
Textbooks:														
1. Gambhi												-		
<ol> <li>Nevelli,</li> <li>Shetty, 1</li> </ol>														
		Coller		morog	zy , 5.	Chand		ompan	y Liu, I		ciiii, 2	014.		
References			••••								~	1.0	0 1000	
													6) - 1988 ition 2015	
<ol> <li>Binavika</li> <li>Santhak</li> </ol>														
Course Ob	jectives	5:				-			-					
<ol> <li>To prov</li> <li>To impation</li> </ol>		Ũ	-	•				e throu	gh lab	oratory	and fi	eld tes	sts.	
<ol> <li>To illus</li> <li>To illus</li> </ol>			•			•		ield app	olicatio	ons.				
Course Lea				1										
												Bloor	n's Cogni	tive
СО	After	the co	mpletio	on of tl	ne cour	se the	student	t should	l be ab	le to	Le		U	riptor
	Expl	ain the	e funct	ional	role of	ingre	dients	and ad	lmixtu	res in	Г			yzing
CO1	_		al and s			-							·	, C
CO2	Discu	uss var	ious pr	opertie	es of fre	esh and	l harde	ned cor	ncrete.		I	/	Unders	tanding
CO3	Desig	gn con	crete m	ix for	various	grade	s of co	ncrete.			V	Ί	Crea	ating
CO-PO Ma	pping	:												
РО	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
CO1	3													2
CO2	2													2
CO3			3										2	3
Assessment														
Teacher As								. ~						
Two compo Semester Ex											ion (N	4SE) a	ind one Er	ıd
		Asses	sment							N	Marks	5		
		IS	E 1								10			
		Μ	SE								30			
		IS	E 2								10			
		E	SE				1				50			
ISE 1 and IS	SE 2 ar	e based	l on ass	ignme	nt/decl	ared te	st/quiz	/semina	ar etc.					
MSE: Asses	sment	is base	d on 50	)% of c	course o	conten	t (Norn	nally fi	rst thre	e modu	iles)			
ESE: Assess					urse co	ntent v	vith 60-	-70% w	veighta	ge for c	course	conte	nt (norma	lly last
three modul	es) cov	vered af	ter MS	E.										

Title of the	Course:										L	Т	Р	Cr
<u>Hydraulics</u>	Laborator	ry (5CV2	<u>271)</u>								0	0	2	1
Pre-Requis	site Cours	ses: Flu	id Mec	hanics	and H	ydrauli	cs							
Textbooks	:													
	ngarajuK. Edition, 19		w in Oj	pen Ch	annels"	', Tata I	McGra	w Hill	Publica	tion Co	o. Ltd.,	New D	elhi,	
2. Asv	wa G.L. "] hi, S.K., '	Experim												
References	•													
	M. Modi a			'Hydra	ulics ar	nd Flui	d Mech	anics",	Stand	ard Boo	k			
	use, 9 <sup>th</sup> Ec			A	ationa	of Elui	d Maal		Tata N	<b>L</b> oCassa	11:11 D			
	oramanyal , Ltd., 7 <sup>th</sup>		•	Аррис	cations	of Flui	a Meci	lanics	Tata N	IcGraw	HIII P	ublishi	ng	
	nTe Chow			l Hydr	aulics",	Tata 1	McGra	w Hill	Publisł	ing, 1 <sup>st</sup>	Editio	n,2000.		
Course Ob	jectives :													
	olore the f													
	nonstrate provide st												urbine.	
Course Lea	•						U			1				
												Bloo	n's Cogn	itive
CO	After the	e comple	etion of	f the co	urse th	e stude	nt shou	ld be a	ble to		I	evel	-	riptor
	Comput	e veloci	ty and	mannir	ig's cor	nstant f	orthe o	pen cha	annel f	low an				-
CO1	apply kr		•		•			•				2	Unders	tanding
CO2	<u>demons</u> apply th										N	2,3	Арр	lying
CO3	analyzet wheel tu		ormanc	e and v	vorking	of cen	trifuga	l pump	and Pe	lton		4	Anal	yzing
CO-PO Ma	apping : (	Use 1, 2	, 3 as (	Correla	ation S	trengtl	ns)							
РО	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
CO1				1									1	1
CO2				2									2	2
CO3				3									2	2
Assessmen														
Lab Asses	sment:													

Pre-Requisite Courses: Exposure to course in Basic Materials and Construction

#### **Textbooks:**

- 1. N. Kumarswamy and A. Kameshwar Rao., "Building Planning and Design," Chraotar Publishing House Pvy. Ltd., 8<sup>th</sup> edition, 2010.
- 2. V. B. Sikka, A Course in Civil Engineering Drawing, S. K. Kataria and Sons, 7<sup>th</sup> Edition, 2015.
- 3. National Building Code of India 2005 and SP- 7, Bureau of Indian Stds. 2<sup>nd</sup> Edition.

### **References:**

- 1. Pierce S Rowland, Planning: The Architect's Handbook "E. & OE", Iliffe Books Ltd. London
- 2. Callender, Time saver's standard's of Architectural design data, Tata Mc Graw Hill Pub.
- 3. Shah, Kale & Patki, "Building drawing with Integrated approach", Tata Mc Graw Hill Pub.
- 4. S. C. Agarwal, "Architecture and Town Planning".

Course Objectives : To impart the class

- 1. the approach to functionally plan and design a typical building by applying concepts of principal of planning and implementation of byelaws.
- 2. necessary knowledge to apply the various building services viz. plumbing, electrification and furniture within the buildings.
- 3. awareness of aesthetics and architectural ornamentation in buildings through engineering drawings.

со	A ftor th	a aamni	lation o	f the ear	rea tha	atudan	tchoul	the chi	a ta			Bloo	om's	Cogn	itive
CO	Alter u	e comp		f the cou	ii se tile	studen	it should		e 10			Leve	l	Des	criptor
CO1		al, funct	tional, a	rements architect ng proce	ural asp	pects ar	nd apply	the pri			nning,	2, 3,	6		erstand pply,
CO2	Perceiv facilitie	-		ferent be ation ser	•	service	es name	ly, wate	er supp	ly, drai	nage	2, 3			lerstand
CO3	Commu compos							•	chniqu	les and		3, 6			pply, esign
CO-PO	) Mappi	ng:(Us	e 1, 2, 3	3 as Coi	relatio	on Stre	ngths)								
PO	1	2	3	4	5	6	7	8	9	10	11	12	PS	<b>60</b> 1	PSO
CO1		2	3											2	
CO2			2				3							2	
CO3	2				2				1	1				2	

the planning concepts using principles of engineering sciences in consideration for the

Title of the Advanced			ratorv	(5CV	274)						L	Т	P 2	Cr 1
Pre-Requi	site Cou	rses:					• -							
Engineerin	g Survey	ing (4CV	(205) a	nd Eng	gineerin	ig surve	eying La	borate	ory (4C	CV253)				
Text Book	s:													
2. N. De	C. Punm N. Basal Ihi. R. Arora	k, "Surve	ying an	d Leve	elling",	Tata M	Icgraw I	Iill Ed	lucatio	n Pvt L	td, $2^{nd}$	edition		
Reference		-	-											
<ol> <li>Du</li> <li>Du</li> <li>Ba</li> <li>R.I</li> </ol>	uggal S. K nnister a E. Davis, ork.	nd Raym	ond, "S	lurveyi	ng", El	LBS, L	ongman	Group	b Ltd.,	Englan	d.		Compan	y, New
Course Ob	ojectives	:												
2. То	study ad develop struments	and retai	n a bas	ic unde	•	Ũ				nctions	of adva	anced s	survey	
Course Le	arning (	Dutcome	S:											
СО	After t	he compl	etion of	f the co	ourse th	ne stude	ent shou	d be a	ble to				n's Cogi	
		-										Level	De	escriptor
CO1	-	nent appr theodolit	•						n digita	l level,		3	A	pplying
CO2	Study	opograpl	nic fea	ture								4	Aı	nalyzing
CO3	Verify	suitabilit	y of spo	ecial fu	unction	s for m	ajor eng	neerii	ng proj	ect		5	Ev	aluating
СО-РО М	apping :													
РО	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
CO1	1				3				2				1	
CO2				2					2				1	
CO3				2					2				1	
Assessmen	nts			•										
<b>Teacher</b> A There are fo MP: Lab E	our compo	onents of				, LA2,	LA3 an	d Lab	ESE.					
Assessm	ent	Base	ed on		Co	onducte	ed by	Co	nducti	on and	Marks	Submi	ssion	Marks
LA1		Lab ac attendanc	tivities ce, jour				Faculty		•		Week end of		5	25
LA2			tivities	,	Lab (	Course	Faculty		-		Week e end of		9	25
LA3		Lab ac attendanc	tivities ce, jour		Lab (	Course	Faculty		•		to Wee		14	25

Title of the Course:         Material Testing Lab (5CV275)         Pre-Requisite Courses: Solid Mechanics										L	Т	P	Cr		
									-	-	02	01			
Pre-Requis	site Cour	ses: Soli	id Mec	hanics											
Textbooks	:														
	beler R.	-				-									
-	oov E. B.,														
3. Gei	e and Tir	noshenk	io, "Me	chanic	s of Ma	aterials	", CBS p	oublis	hers, 2 <sup>1</sup>	<sup>a</sup> Editio	on, 200	04.			
References	:														
	er and Joh	-				-					-				
	drew Pyte														
	noshenko Edition, 2		oung. I	D. H, "	Strengt	h of M	aterial",	McG	raw Hi	ll Book	Comp	any P	ublicatio	n,	
Course Ob	,														
	demonstr		ratory e	experir	nents fo	or testir	ng of var	ious t	ouilding	g mater	ials.				
2. То	conduct e	experime	ents to e	evaluat	te vario	us prop	perties of	mate	rials fo	r qualit	ty cont	rol.			
3. То	provide t	he know	ledge o	of pern	nissible	values	of mate	rial pr	opertie	s as per	r codal	require	ements.		
Course Lea	arning O	utcomes	5:												
<u> </u>	After the completion of the course the student should be able to										<b>Bloom's Cognitive</b>				
CO										Le	evel	Descriptor			
CO1	<b>Explain</b> the methodology of conducting experiments on construction materials as per codal provisions.											2	Understanding		
CO2	<b>Evaluate</b> the properties of construction materials by conducting Laboratory tests.											5	Evaluating		
CO3	Analyze and interpret properties of construction materials for acceptance criteria.											4	Analyzing		
CO-PO Ma	apping :														
РО	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2	
CO1				1										1	
CO2				2					2				1	2	
CO3				3		1			3				1	2	
Assessmen	ts :														
Lab Asses			1-1			1 4 2	1.4.2	1 7 1	ECE						
There are for MP: Lab ES	-					, LA2,	LA3 and	i Lab	ESE.						
Assessme	Lab ESE is a separate head of passing.sessmentBased on			Conducted by			Conduction and Marks Submission Marks								
LA1		Lab ac		Lab Course Faculty			During Week 1 to Week 4								
	attendance, journal Submission at the e									nd of Week 5					
LA2	Lab activities, Lab Course Faculty								25						
	a	attendance, journal Lab activities,								Submission at the end of Week 925During Week 10 to Week 1425					
LA3	a	attendance, journal					Lab Course Faculty			Submission at the end of Week 1425					

Lab Course faculty

Lab Performance and

related documentation

Lab ESE

During Week 15 to Week 18

Submission at the end of Week 18

25

separation and its control.						
Module 6: Dimensional Analysis and model testing:						
Dimensional analysis, Buckingham's theorem, Dimensionless numbers and their significance. Model similitude, Model laws, Theory and applications.						
Moodle wise Outcomes:						
At end of each module students will be able to						
<ol> <li>Explain the properties of fluid, pressure measuring devices and compute hydrostatic forces acting on different plane.</li> <li>Explain fluid Kinematics and apply the knowledge forsolving problem of the pipe flow</li> </ol>						
<ul> <li>system.</li> <li>3. Explain thefluid dynamics and applythe knowledge for solving the pipe flow system.</li> <li>4. Explain the laminar and turbulent flow and apply the knowledge for solving the problem of water distribution pipe network system.</li> </ul>						
<ol> <li>Explain the boundary layer formation theory and its applications.</li> <li>Explain the dimensionless numbers and apply for model simulation.</li> </ol>						
Tutorials:						
Problems on following topics will be covered in tutorial hours;						
1. The properties of fluid, pressure measuring devices and compute hydrostatic forces acting on different plane.						
2. Fluid Kinematics and apply the knowledge for solving problem of the pipe flow system.						
3. The fluid dynamics and apply the knowledge for solving the pipe flow system.						
4. The laminar and turbulent flow and apply the knowledge for solving the problem of water distribution pipe network system.						
5. The boundary layer formation theory and its applications.						
6. The dimensionless numbers and apply for model simulation.						