19CE3404 - CONSTRUCTION MATERIALS & CONCRETE TECHNOLOGY

Course Category:				Program Core							Credits:		3		
Course Type:				Theory						Le	Lecture-Tutorial- Practical:		3-0-0		
*1											Continuous				
Prerequisites:				19BS1101 – Engineering Mathematics – I 19BS1102 -Chemistry of Materials							Evaluation: Semester End		3	0	
										5			70		
												valuation:		-	
				Total Marks:								10)0		
Course			1	6.1		.1 .			1 .						
Upon s		sful com								. 1 / 1	1/1	1		T	
CO1		Understand the importance of stone/ brick/ wood/timber/plywood/bamboo as an affective huilding metazial in construction											K2		
CO2		effective building material in construction Describe the various functional components of a building.												V.	
						-				-				K2	
CO3		lerstan									anarata			K2	
CO4								<u> </u>		f fresh c				K2	
CO5		ed on sti							Ication	s for de	signing	concrete	mixes	K3	
	Dase								iovomo	nt of Dr	oarom (outcomes			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	3					2			10		3	3		
CO2	3	3										3	3		
CO3	3	3					2					3	3		
CO4	3	3					2					3	3	2	
CO5	3	3	3									3	3		
Avg.	3	3	3				2					3	3	2	
0	1	1- Lo)W		1		2-Me	dium				3-High	1		
						Cou	rse ([~] onf	ent						
		Tonstru	ation	Motor		Cou		Com	CIII						
	Construction Materials: Stones and Bricks - Properties of building stones, classification of stones, stone														
	quarrying, Manufacturing of bricks various types of bricks and blocks used for														
	0	marrvin	σ Μa												
UNIT-														CO1	
UNIT-	1 c	onstruc	tion, to	ests on	bricks	s and b	olocks;	Wood	1: Clas	sificatio	n of var	rious typ	bes of	CO1	
UNIT-	1 c	onstruc voods u	tion, to sed in	ests on buildi	bricks ngs; Ti	s and t mber -	olocks; - seasc	Wood oning c	d: Clas of timb	sificatio er, Defe	n of van cts in Ti	rious typ imber M	bes of larket	CO1	
UNIT-	1 c v f	onstruc voods u	tion, to sed in Indus	ests on buildin strial ti	i bricks ngs; Ti imber–	s and b mber - · Plyw	olocks; - seasc	Wood oning c	d: Clas of timb	sificatio er, Defe	n of van cts in Ti	rious typ	bes of larket	C01	
UNIT-	1 c v f	onstruc voods u orms –	tion, to sed in Indus ty as a	ests on buildin strial ti buildin	i bricks ngs; Ti imber– ng mat	s and b mber - · Plyw	olocks; - seasc	Wood oning c	d: Clas of timb	sificatio er, Defe	n of van cts in Ti	rious typ imber M	bes of larket	C01	
UNIT-	1 c v f s 0	onstruc voods u orms – uitabilit C onstru Types of	tion, to sed in Indus ty as a iction	ests on buildin strial ti buildin Practi tural s	i bricks ngs; Ti imber– ng mat ces: ystems	s and b mber - Plyw erial -load	blocks; - seasc ood – bearing	Wood oning c Vene	d: Clas of timb er –pa	sificationer, Defe nels of ramed st	n of van cts in Ti laminat	rious typ imber M tes; Ban load tra	nsfer	CO1	
	1 c v f s C T n	onstruc voods u orms – uitabilit Constru Types of nechani	tion, to sed in Indus ty as a iction f Struc sm; Fc	ests on buildin strial ti buildin Practi tural s oundati	h bricks ngs; Ti imber– ng mat ces: ystems lons – l	s and b mber - Plyw erial -load Deep fe	blocks; - seaso ood – bearing	Wood oning c Vene g struc	d: Clas of timb er –pa ture- fr d its ty	sification er, Defe nels of ramed st pes, Sha	n of van cts in Ta laminat tructure- llow for	rious typ imber M res; Ban load tra undation	es of larket nboo-		
UNIT-	1 c v f f s C T n n -2 it	onstruc voods u orms – uitabilit Constru Types of nechani ts types	tion, to sed in Indus ty as a iction f Struc sm; Fo ; Mas	ests on buildin strial ti buildin Practi tural sy bundati onry -'	h bricks ngs; Ti imber– ng mat ces: ystems lons – l Types	s and t mber - Plyw erial -load Deep fo of ma	blocks; - seasc ood – bearing oundat sonry,	Wood oning c Vene g struc ion an Englis	d: Clas of timb er –pa ture- fi d its ty sh and	sification er, Defe nels of ramed st pes, Sha Flemis	n of van cts in Tr laminat tructure- llow for h bonds	tious typ imber M es; Ban load tra undation , Rubble	es of larket nboo- unsfer s and e and		
	1 c v y f f s 7 7 7 7 7 7 7 7 9 7 8	onstruc voods u orms – <u>uitabilit</u> Constru Cypes of nechani ts types Ashlar M	tion, to sed in Indus ty as a action f Struc sm; Fo ; Mas Mason	ests on buildin strial ti <u>buildin</u> Practi tural s pundati onry -' ry; Mc	h bricks ngs; Ti imber– ng mat ces: ystems tons – 1 Types ortar: In	s and t mber - Plyw erial -load Deep fo of ma mporta	blocks; - seasc ood – bearin oundat sonry, ince, p	Wood oning c Vene g struc ion an Englis	d: Class of timb er –pa ture- fi d its ty sh and ies and	sification er, Defe nels of ramed st pes, Sha Flemis I types	n of van cts in Tr laminat tructure- ullow for h bonds of morta	tious typ imber M es; Ban load tra undation , Rubble ar; Finis	unsfer and and and and hing-		
	1 c v v f s 7 7 7 7 7 7 7 7 1 1 4 4 1	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H	tion, to sed in Indus ty as a iction f Struc sm; Fc sm; Fc vason Proofin	ests on buildin trial ti buildin Practi tural s bundati onry -' ry; Mc ng, wa	h bricks ngs; Ti imber ng matr ces: ystems fons - 1 Types ortar: In ter pro-	s and t mber - Plyw erial -load Deep fo of ma mporta oofing	blocks; - seasc ood – bearing oundat sonry, ince, p mate	Wood oning c Vene g struction an Englist ropert rials a	d: Class of timb er –pa ture- fi d its ty sh and ies and nd th	sification er, Defe nels of ramed st pes, Sha Flemis I types	n of van cts in Tr laminat tructure- ullow for h bonds of morta	tious typ imber M es; Ban load tra undation , Rubble	unsfer and and and and hing-		
	1 cc vv ff ss 7 7 7 7 7 7 1 1 1 1 1	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H ngredie	tion, to sed in Indus ty as a action f Struc sm; Fo ; Mason Proofin nts, ty	ests on buildin strial ti buildin Practi tural s bundati onry -' ry; Mc ag, wa pes, wl	i bricks ngs; Ti imber– ng mati ces: ystems ions – I Types ortar: In ter prinite wa	s and t mber - Plyw erial -load Deep fo of ma mporta oofing	blocks; - seasc ood – bearing oundat sonry, ince, p mate	Wood oning c Vene g struction an Englist ropert rials a	d: Class of timb er –pa ture- fi d its ty sh and ies and nd th	sification er, Defe nels of ramed st pes, Sha Flemis I types	n of van cts in Tr laminat tructure- ullow for h bonds of morta	tious typ imber M es; Ban load tra undation , Rubble ar; Finis	unsfer and and and and hing-		
	1 c v f f s f f f f f f f f f f f f f f f f	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H ngredie Concret	tion, to sed in Indus ty as a action f Struc sm; Fc ; Mas Mason Proofin nts, ty ce Ingr	ests on buildin strial ti buildin Practi tural sy bundati onry -' ry; Mc ry; Mc ry, wa pes, wl redient	a bricks ngs; Ti imber– ng mati ces: ystems tons – I Types ortar: In ter pro- nite wa s:	s and b mber - Plyw erial -load Deep fo of ma mporta oofing shing a	blocks; - seasc ood – bearing oundat sonry, ince, p mate and dis	Wood oning c Vene g strucc ion an Englis ropert rials a stempe	d: Class of timb er –pa ture- fi d its ty sh and ies and th ering.	sification er, Defe nels of ramed st pes, Sha Flemis I types eir uses	n of var cts in Tr laminat tructure- illow for h bonds of morta s, Plaste	ious typ imber M es; Ban load tra undation , Rubble ar; Finis ering, P	es of larket nboo- unsfer is and e and hing- aints,		
	1 cc vv ff s 7 7 7 7 7 7 7 7 7 7 1 1 1 1 1 1 1 1 0 0 0	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H ngredie Concret Cement:	tion, to sed in Indus ty as a ction f Struc sm; Fo ; Mas Mason Proofin nts, tyj e Ingr Portla	ests on buildin strial ti <u>buildin</u> Practi tural sy pundati onry -' ry; Mc ag, wa pes, wil redient and ce	a bricks ngs; Ti imber– ng mate ces: ystems tons – l Types ortar: In ter pro- nite wa ts: ment –	s and b mber - Plyw erial -load Deep fo of ma mporta oofing shing : - chem	blocks; - seasc ood – bearin; oundat sonry, ince, p mate and dis	Wood oning c Vene g struction an Englist ropert rials a stempe	d: Class of timb er –pa ture- fi d its ty sh and ies and th ering.	sificatio er, Defe nels of ramed st pes, Sha Flemis I types eir uses Manuf	n of var cts in T laminat tructure- dllow for h bonds of morta s, Plaste acturing	ious typ imber M es; Ban load tra undation , Rubble ar; Finis ering, P - Hydra	es of larket nboo- unsfer is and e and hing- aints, ation,		
	1 c v f f s 7 7 7 7 7 7 7 7 7 7 7 7 7	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H ngredie Concret Concret	tion, to sed in Indus ty as a action f Struc sm; Fo sm;	ests on buildin strial ti buildin Practi tural s bundati onry -' ry; Mc ag, wa pes, wl redient and ce ent - S	a bricks ngs; Ti imber– ng mate ces: ystems tons – l Types ortar: In ter pro- nite wa ts: ment –	s and b mber - Plyw erial -load Deep fo of ma mporta oofing shing : - chem	blocks; - seasc ood – bearin; oundat sonry, ince, p mate and dis	Wood oning c Vene g struction an Englist ropert rials a stempe	d: Class of timb er –pa ture- fi d its ty sh and ies and th ering.	sificatio er, Defe nels of ramed st pes, Sha Flemis I types eir uses Manuf	n of var cts in T laminat tructure- dllow for h bonds of morta s, Plaste acturing	ious typ imber M es; Ban load tra undation , Rubble ar; Finis ering, P	es of larket nboo- unsfer is and e and hing- aints, ation,		
UNIT	1 c v f f s f C T n n -2 iii A f f S S T	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H ngredie Concret Cement: Cetting C	tion, to sed in Indus ty as a action f Struc sm; Fo ; Mason Proofin nts, typ e Ingr Portla of ceme	ests on buildin strial ti buildin Practi tural s bundati onry -' ry; Mc ag, wa pes, wh redient and ce ent - S nt.	a bricks ngs; Ti imber ng mati- ces: ystems ions - I Types ortar: In ter pro- nite wat s: ment - Structur	s and t mber - Plyw erial -load Deep fo of ma mporta oofing shing : - chem re of h	blocks; - seasc ood – bearing oundat sonry, ince, p mate and dis ical co ydrate	Wood oning c Vene g struction an Englis ropert rials a stempe d cemo	d: Class of timb er –pa ture- fi d its ty sh and ies and ies and th ering.	sificationer, Defender, Defender, Defender, Sharrander, Sharrander	n of van cts in T laminat tructure- illow for h bonds of morta s, Plaste acturing	ious typ imber M es; Ban load tra undation , Rubble ar; Finis ering, P - Hydra tory test	es of larket aboo- unsfer s and e and hing- aints, ation, ing –	CO2	
	1 c v v f s -2 in A D H C C S S T -3 A	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp I ngredie Concret Cement: Setting of Aggrega	tion, to sed in Indus ty as a action f Struc sm; Fo ; Mas Masom Proofin nts, ty e Ingr Portla of ceme f ceme tes: C	ests on buildin strial ti buildin Practi tural spoundati onry -' ry; Mc ag, wa pes, wh redient and ce ent - S nt. lassific	a bricks ngs; Ti imber– ng mati ces: ystems ons – I Types ortar: In ter pro- nite wa s: ment – Structur cation o	s and b mber - Plyw erial -load Deep fo of ma mporta oofing shing : - chem re of h	blocks; - seasc ood – bearin; oundat sonry, ince, p mate and dis iical co ydrate regate	Wood oning c Vene g strucc ion an Englis ropert rials a stempe d cema	d: Class of timb er –pa ture- fi d its ty sh and ies and th ering. ition – ent – F	sificatio er, Defe nels of ramed si pes, Sha Flemis l types eir uses Manuf field and shape o	n of van cts in T laminat tructure- illow for h bonds of morta s, Plaste acturing l Labora & textur	ious typ imber M es; Ban load tra undation , Rubble ar; Finis ering, P - Hydra tory test e, streng	es of larket arket aboo- unsfer s and e and hing- aints, ation, ing – gth &	CO2	
UNIT	1 c c v v fr s s c c c c c c c c c c c c c c c c c	onstruc voods u orms – <u>uitabilit</u> Constru Cypes of nechani ts types Ashlar M Damp H ngredie Concret Cement: Setting of Cypes of Aggrega other me	tion, to sed in Indus ty as a iction f Struc sm; Fo ; Mas vlasom Proofin nts, typ te Ingr Portla of ceme f ceme tes: Ci cchanic	ests on buildin strial ti <u>buildin</u> Practi tural sy pundati onry -' ry; Mc ng, wa pes, wh redient and ce ent - S nt. lassific cal pro	a bricks ngs; Ti imber- ng math ces: ystems tons - I Types ortar: In ter pro- nite wa s: ment - Structur cation operties	s and b mber - Plyw erial -load Deep fo of ma mporta oofing shing a - chem re of h	blocks; - seasc ood – bearing oundat sonry, ince, p mate and dis itcal co ydrate regate regate	Wood oning c Vene g struction an Englist propert rials a stempes d ceme Particl – Spe	d: Class of timb er –pa ture- fi d its ty sh and ies and th ering. ition – ent – F le size, cific gi	sificatio er, Defe nels of ramed st pes, Sha Flemis I types eir uses Manuf rald and shape a ravity, B	n of var cts in T laminat tructure- allow for h bonds of morta s, Plaste acturing l Labora & textur sulk den	ious typ imber M es; Ban load tra undation , Rubble ar; Finis ering, P - Hydra tory test e, streng sity, por	ess of larket aboo- unsfer as and e and hing- aints, ation, ing – gth & osity,	CO2	
UNIT	1 cc vv ff s 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H ngredie Concret Cement: Setting of Aggrega other me dsorptio	tion, to sed in Indus ty as a ction f Struc sm; Fo ; Mas Mason Proofin nts, typ e Ingr Portla of ceme f ceme tes: C cchanic on &	ests on buildin trial ti <u>buildin</u> Practi tural s poundati onry -' ry; Mc ag, wa pes, wh redient and ce ent - S nt. lassific cal pro moistu	a bricks ngs; Ti imber ng mate ces: ystems tons - 1 Types ortar: In ter pro- nite wa ts: ment - Structur cation of perties re con	s and b mber - Plyw erial -load Deep fo of ma mporta oofing shing : - chem re of h of aggr of aggr tent of	blocks; - seasc ood – bearin; oundat sonry, ince, p mate and dis ical co ydrate regate gregate f aggre	Wood oning c Vene g struct ion an Englist ropert rials a stempe d ceme Particl – Spe egate -	d: Class of timb er –pa ture- fi d its ty sh and ies and th ering. ition – ent – F le size, cific gr – Bulk	sificatio er, Defe nels of ramed st pes, Sha Flemis I types eir uses Manuf Field and ravity, B ing of	n of var cts in T laminat tructure- dllow for h bonds of morta s, Plaste acturing l Labora & textur sulk den sand –	ious typ imber M ees; Ban load tra undation , Rubble ar; Finis ering, P - Hydra tory test e, streng sity, por Soundne	ess of larket nboo- unsfer as and e and hing- aints, ation, ing – gth & osity, ess of	CO2	
UNIT	1 c v f f s 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H ngredie Concret Cement: Cetting of Aggrega other me dsorptic ggregat	tion, to sed in Indus ty as a action f Struc sm; Fo ; Mason Proofin nts, typ e Ingr Portla of ceme f ceme tes: C echanic on & e -Sie	ests on buildin strial ti buildin Practi tural s bundati onry -' ry; Mc ag, wa pes, wh redient and ce ent - S nt. lassific cal pro- moistu eve ar	a bricks ngs; Ti imber- ng matu- ces: ystems ions - I Types ortar: In ter pro- nite wat s: ment - Structur cation of perties re con nalysis	s and b mber - Plyw erial -load Deep fo of ma mporta oofing shing : - chem re of h of aggr of aggr of aggr tent of - Fin	blocks; - seasc ood – bearing oundat sonry, ince, p mate and dis ical co ydrate regate regate f aggro neness	Wood oning c Vene g struct ion an Englist ropert rials a stempe d ceme Particl – Spe egate -	d: Class of timb er –pa ture- fi d its ty sh and ies and th ering. ition – ent – F le size, cific gr – Bulk	sificatio er, Defe nels of ramed st pes, Sha Flemis I types eir uses Manuf Field and ravity, B ing of	n of var cts in T laminat tructure- dllow for h bonds of morta s, Plaste acturing l Labora & textur sulk den sand –	ious typ imber M es; Ban load tra undation , Rubble ar; Finis ering, P - Hydra tory test e, streng sity, por	ess of larket nboo- unsfer as and e and hing- aints, ation, ing – gth & osity, ess of	CO1	
UNIT	1 c v f v f s 7 -2 in A F -3 A c o a a A A C C S S C C C C C C C C C C C C C	onstruc voods u orms – uitabilit Constru Cypes of nechani ts types Ashlar M Damp H ngredie Concret Cement: Setting of Aggrega other me dsorptio	tion, to sed in Indus ty as a action f Struc sm; Fo ; Mas Masom Proofin nts, ty a Ingr Portla of ceme f ceme tes: C cchanic on & ie – Sic tes – A	ests on buildin trial ti buildin Practi tural s bundati onry -' ry; Mc ag, wa pes, wh edient and ce ent - S cal pro moistu eve ar <u>Alterna</u>	a bricks ngs; Ti imber ng matu ces: ystems ons - I Types ortar: In ter pro- nite wa structure cation of perties re con nalysis tives to	s and b mber - Plyw erial -load Deep fo of ma mporta oofing shing : - chem re of h of aggr of aggr tent of - Fin o river	blocks; - seasc ood – bearin; oundat sonry, ince, p mate and dis iical co ydrate regate gregate gregate f aggro heness sand	Wood oning c Vene g struct ion an Englist ropert rials a stempe d ceme Particl – Spe egate -	d: Class of timb er –pa ture- fi d its ty sh and ies and th ering. ition – ent – F le size, cific gr – Bulk	sificatio er, Defe nels of ramed st pes, Sha Flemis I types eir uses Manuf Field and ravity, B ing of	n of var cts in T laminat tructure- dllow for h bonds of morta s, Plaste acturing l Labora & textur sulk den sand –	ious typ imber M ees; Ban load tra undation , Rubble ar; Finis ering, P - Hydra tory test e, streng sity, por Soundne	ess of larket nboo- unsfer as and e and hing- aints, ation, ing – gth & osity, ess of	CO2	

	Admixtures: Benefits of admixtures, Classification of admixtures, Fly ash, GGBS,										
	Silica fume, accelerators, retarders, water- reducing admixtures, super plasticizer										
	Fresh Concrete: Properties of fresh concrete, workability, factors affecting										
	workability, measurement of workability, Segregation and Bleeding, Process of manufacture of concrete, quality of mixing water.										
	manufacture of concrete, quanty of mixing water.										
	Hardened Properties and Mix Proportioning:										
	Strength & Durability of Concrete: Water/cement ratio, factor affecting strength of										
UNIT-5		05									
	Sulfate attack, alkali aggregate reaction, Carbonation of concrete										
	Mix proportioning: - Factors affecting the mix proportioning of Concrete,										
	proportioning of concrete mixes by- IS 10262- 2019 and IS 456.										
	Learning Resources										
	1. S.C. Rangwala, Engineering Materials, 4/e, Charotar Publishing House, 20	14.									
Text Bo	2. B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, Building Construction										
Text Do	Laxmi Publications, 2005										
	3. M.S. Shetty, Concrete Technology, 7/e, S.Chand and Company Ltd, 2015.										
	1. P.C. Varghese, A Text Book Building Materials, 1/e, Prentice-Hall,										
	Publication, 2005.										
Refere	2. A.M. Neville and J.J. Brooks, Concrete Technology, 2/e, Prentice Hall, 2010.										
Book	3. P.K.Mehta, Concrete: Microstructure, Properties and Materials, 4/e, McGra	w-									
DOON	Hill Education, 2014.										
	4. A.R.Santha Kumar, Concrete Technology, 2/e, Oxford University Press India,										
	2018.										
e-Resour											
other dia											
materi	ai ai										