Walchand College of Engineering

(Government Aided Autonomous Institute)

Vishrambag, Sangli-416415



S. Y. M. Tech. (Civil - Structural Engineering) Sem-III and IV

Effective from AY 2024-25

Course Contents for M. Tech. Programme, Civil - Structural Engineering, AY2024-25

Walchand College of Engineering, Sangli								
	(Government Aided Autonomous Institute)							
			(A I 2024-2	otion			
Progra	amme		M Tech Civ	il - Structural F	ngineering			
Class	Semes	ter	Second year	M Tech Seme	ster III			
Course	e Code		7ST691	vi. reen., sente				
Course	e Name	e	Dissertation 1	Phase - I				
Desire	d Rear	usites:	Courses of Se	emester I and II	of F. Y. M. Tec	h (Civil - Str	uctural	
Desire	u 11091		Engineering)				u c cui ui	
			6					
Те	aching	Scheme		Exami	nation Scheme	(Marks)		
Practio	cal	24 Hrs/week	LA1	LA2	2 E	SE	Total	
			30	30	4	40	100	
					Credits: 12			
				Course Object	ives			
1	To ir	npart knowle	edge for estal	blishing objec	tives by carryi	ng out exte	ensive literature	
1	revie	w on selected	l dissertation	topics.				
2	То	develop me	thodology t	to execute t	he proposed	research	work through	
2	analy	tical/experim	nental work.					
3	To an	alyse, interpre	t, debate, and o	classify the find	ings of the work	•		
		Cour	rse Outcomes	(CO) with Blo	om's Taxonomy	v Level		
At the	end of	the course, the	e students will	be able to,				
CO1	Execu	ute detailed li	terature survey	to understand	research develo	pments and	Applying	
	set up	research hypo	otheses.				Арргушд	
<u>CO2</u>	Cons	truct research	methodology	to evaluate the	research hypothe	esis.	Analysing	
CO3	Asses	s research idea	a with perspect	tive scope.			Evaluating	
CO4	Devis	e the research	objectives to s	solve the given	problem formula	ated through	Creating	
	Interat	ture study.					6	
				Contorte				
The dia			tot. in	Contents	incolor aniontif		lesion collection	
The dis	ssertatio	on work will s	tart in semester	r III, and should	involve scientif	ic research, (lesign, collection,	
Dhase	$\frac{1}{1}$ will	have presen	tation and rea	ort submission	out the marviat	ha presentat	tion will include	
identifi	ication	of the researc	h problem bas	ed on the exten	sive literature re	view on the	topic referring to	
latest l	iteratur	e available de	efining objective	ves of the work	and the method	plogy to be a	donted	
lacost I	iteratur	e uvulluole, u	ining objective	es of the work,	una une metrioa		aoptea.	
				References				
1	Na	tional and Inte	ernational jour	nals, Conferenc	e Proceedings in	Structural E	Engineering.	
2	Te	chnical Repor	ts of Profession	nal societies.	<u> </u>		U	
3	Int	ernational and	I national code	s of Practices an	nd Handbooks.			
4	Int	ernet sources	and Distance I	earning.				
5	Pu	blished Ph.D.	and M. Tech T	Thesis of Repute	ed Institutes.			
				CO-PO Mapp	ing			
				Programm	e Outcomes (PO	D)		
		1	2	3	4	5	6	
<u> </u>	201			2	2		3	
C	CO2			2	2		3	
C	203	1		2			2	
CO4 1 3 3						3		

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High Each CO of the course must map to at least one PO.

Assessment

There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing (min 40 %), LA1+LA2 should be min 40%

Assessment	Based on	Conducted by	Typical Schedule	Marks	
	Lab activities,		During Week 1 to Week 8		
LA1	attendance,	Lab Course Faculty	Marks Submission at the end of	30	
	journal		Week 8		
	Lab activities,		During Week 9 to Week 16		
LA2	attendance,	Lab Course Faculty	Marks Submission at the end of	30	
	journal		Week 16		
	Lab activition	Lab Course Faculty	During Week 18 to Week 19		
Lob ESE	Lab activities,	and External	Marks Submission at the end of	40	
Lau ESE	journal/	Examiner as	Week 19	40	
	performance	applicable			

Week 1 indicates starting week of a semester. Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course.

Walchand College of Engineering, Sangli								
(Government Aided Autonomous Institute)								
			Course I	nformation				
Progra	Programme M Tech (Civil Structural Engineering)							
Class,	Semester		Second Year M.	Fech., Semester III				
Cours	e Code		7ST611	.,				
Cours	e Name		NPTEL Course -	Advanced Concrete	Fechnology			
Desire	d Requisi	tes:	Concrete technolo	ogy				
	T 1 •	0.1						
Lootuu	Teaching	3 Hrs/wook	MSE	Examination Sch	eme (Marks)	Total		
Lectur	e	5 HIS/WEEK	30	20	<u> </u>	100		
			50	Credit	: 3	100		
			1					
			Course	Objectives				
1	To demo	nstrate a compr	ehensive understant tion, composition, a	ding of fundamental and the role of aggres	concepts in con ates and chemica	crete technology, al admixtures.		
2	To apply factors su	advanced techr	niques for proportion	oning high-performan	ce concrete mixt	tures, considering		
	To devel	op the ability	to critically analys	se and evaluate the	properties of ha	ardened concrete,		
3	including	strength, dur	ability, creep, and	d shrinkage, and p	ropose appropri	ate solutions or		
	improven	nents to enhance	e concrete performa	ance and durability	T 1			
At the	and of the	Course the stud	Outcomes (CO) w	ith Bloom's Taxono	my Level			
At the		course, the stud	ients will be able to	,	Bloom's	Bloom's		
СО		Course	e Outcome Statem	ent/s	Taxonomy Level	Taxonomy Description		
CO1	Explain	the composition	n of different type	s of cement and the	ir π	Understanding		
	basic che	mical and physi	cal properties			Understanding		
CO2	Evaluate specific c	the suitability of the suitabili	of aggregates and cl tions	hemical admixtures f	or V	Evaluating		
CO3	Assess th	e effects of min nce	eral admixtures on o	concrete properties ar	^{id} V	Evaluating		
CO4	Compare and their	e and contrast	different mixture presenting	proportioning method	ls IV	Analysing		
CO5	Assess th	e factors influe	ncing the propertie	s of hardened concre	te v	Evoluation		
COS	over time	and propose po	otential solutions or	improvements	v d	Evaluating		
	longevity	of concrete inf	rastructure	ee une uuraoinity al	VI	Creating		
Modu	lo		Modulo C	ontonts		Hours		
I	Ceme	ent production a	nd composition. Ce	ment chemistry		7		
II	Aggre	egates for concr	ete, Chemical admi	xtures		7		
III	Chem	ical and Minera	ll admixtures, Mine	eral admixtures		6		
IV	High	performance co	ncrete mixture prop	portioning, Topics in	fresh concrete	7		
V	Topic	s in hardened co	oncrete, Creep and	shrinkage		6		
VI	Durat	oility of concrete	8			6		
	Textbooks							

Course Contents for M. Tech. Programme, Civil - Structural Engineering, AY2024-25

1	Mehta, P. K., and Monteiro, P. J. M., 'Concrete: Microstructure, Properties, and Materials,'
	Fourth Edition (Indian Edition), McGraw Hill, 2014
2	Rafat Siddique, "Special Structural Concretes", Galgotia Publication Private Ltd., 2000
	References
1	Neville, A. M., 'Properties of Concrete,' Pitman Publishing, Inc., MA, 1981.
2	Hewlett, P. C., Ed., 'Lea's Chemistry of Cement and Concrete,' Fourth Edition, Arnold
2	Publishers, NY, 1998.
3	Bentur, A., Diamond, S., and Berke, N.S., 'Steel Corrosion in Concrete,' E&FN Spon, UK, 1997.
4	Taylor, H. W. F., 'Cement Chemistry,' Academic Press, Inc., San Diego, CA, 1990.
5	Lea, F. M., 'The Chemistry of Cement and Concrete,' Chemical Publishing Company, Inc., New
5	York, 1971.
6	Mindess, S., and Young, J. F., 'Concrete,' Prentice Hall, Inc., NJ, 1981.
7	J. Newman and B. S. Choo, Eds., 'Advanced Concrete Technology', Four Volume Set, Elsevier,
	2003
	Useful Links
1	NPTEL :: Civil Engineering - Concrete Engineering and Technology

2 https://onlinecourses.nptel.ac.in/noc24_ce104/preview

CO-PO Mapping										
		Programme Outcomes (PO)								
	1	$1 \ 2 \ 3 \ 4 \ 5 \ 6$								
CO1		2			1					
CO2	2		3	2						
CO3		3	1			2				
CO4	3					3				
CO5			2		2					
CO6	3					3				

The strength of mapping is to be written as 1,2,3; Where, 1: Low, 2:Medium, 3:High. Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

Walchand College of Engineering, Sangli								
	(Government Aided Autonomous Institute)							
	AY 2024-25							
Ducan	Course Information Drognomme M. Tech. Civil. Structural Encineering							
Close	Some	stor	M. Tech. Civil -	Structural Engineer	ing			
Class,			78T612	rech., Selli. III				
Cours	e Nar	ne	NPTEL Course -	- Bridge Engineerin	σ			
Desire	d Red	misites:	Structural Analys	sis Solid Mechanics	s Design of Concrete	Stru	cture Design	
Desire	<i>a</i> 110	quisitest	of Steel Structure	2	s, Design of Concrete	buu	etare, Design	
			1					
Te	achin	ig Scheme		Examination	Scheme (Marks)			
Lectur	re	3 Hrs./week	MSE	ISE	ESE		Total	
			30	20	50		100	
				Cre	dits: 3			
			Car	ma Objectives				
1	To	provide knowl	COL edge of loads and	d analysis for diffe	rent types of bridg	A C		
		mont len aveil -	dag for design of	different types of	and and including	us.	actures with	
2	101	mpart knowled	uge for design of (unterent types of t	struges including st	iostri	uctures with	
	rele	vant codes.						
3	Top	provide knowled	lge for construction	n, inspection and m	aintenance of bridge	s.		
		Com	use Outeemas (CC) with Plaam's T				
At the	end o	f the course the	e students will be a	ble to	axonomy Level			
CO1	Und	lerstand the dif	ferent types of brid	dges its importance	and selection	I II	nderstanding	
CO1		strate compone	ents of bridges and	its necessity based	on various types of	·	iderstanding	
	brid	ges.			· · · · · · · · · · · · · · · · · · ·		Applying	
CO3	Ana	lyze various ty	pes of bridges with	appropriate loads a	and methods.		Analyzing	
CO4	Esti deta	mate the stress ils.	es in the bridge con	mponents and decid	le the reinforcement		Evaluating	
CO5	Des	ign the compon	ents of bridges and	l bearings following	g all safety measures.		Creating	
CO6	Pro	pose various tec	chniques of constru	iction, maintenance	and rehabilitation of	•	Creating	
	brid	ges considering	serviceability duri	ing its lifetime.			Creating	
Modu	le		Mod	ule Contents			Hours	
I	I F	ntroduction Reinforced conc	rete slab bridge de	cks			6	
п	F	RC culverts, Pip	e culvert, Box culv es	vert			6	
	F	Plate girder brid	ges					
III	A	Arch bridges, Su	uspension bridges,	Cable stayed bridg	ges, Balanced cantile	ver	7	
	b	oridges						
IV	F	Prestressed conc	rete bridges and C	omposite bridges			7	
	Ч Т	Rigid Frame Bri	ages and Continuo	bus Girder Bridges				
V	I F	Bridge hearings	Joints and Annurt	enances			7	
	(Construction, M	aintenance and Re	habilitation of bridg	zes			
	A	Advanced topics	in bridge enginee	ring	-		6	
				Textbooks				
-	ŀ	Krishna Raju N.	, "Design of Bridg	es, Oxford and IBH	I Publishing Co. Ltd	.", Ne	ew Delhi and	
	ŀ	Kolkata, 2001.			6	<i>.</i>		

2	Johnson Victor, "Essentials of Bridge Engineering, Oxford and IBH Publishing Co. Ltd.", 5th Edition, 2001.				
2	Jagdeesh T. R., Jayaram M. A., "Design of Bridge Structures, Prentice Hall of India Pvt. Ltd.",				
3	New Delhi, 2003.				
	References				
1	S. Ponnuswamy, "Bridge Engineering", McGraw Hill Education LLC., 2 nd Edition, 2008.				
n	Raina V. K., "Concrete Bridge Practice: Construction and maintenance and rehabilitation",				
2	Tata Mc Graw Hill Publishing Company, New Delhi.				
2	Raina V. K., "Concrete Bridge Practice: Analysis, design and economics", Tata Mc Graw Hill				
3	Publishing Company, New Delhi.				
4	IRC Codes.				
Useful Links					
1	https://onlinecourses.nptel.ac.in/noc24_ce79/preview				
2					
3					
4					

CO-PO Mapping										
		Programme Outcomes (PO)								
	1	1 2 3 4 5 6								
CO1	1	2	2							
CO2			3							
CO3				3						
CO4				2		3				
CO5					3	3				
CO6		2			2	3				
The stre	The strength of mapping is to be written as 1: Low, 2: Medium, 3: High									

Each CO of the course must map to at least one PO.

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Walchand College of Engineering, Sangli								
	AY 2024-25							
	Course Information							
Progra	Degramme M Tech. Civil Structural Engineering							
Class,	Semester		Second Year M. 7	Fech, Sem III				
Cours	e Code		7ST613	,				
Cours	e Name		NPTEL Course -	Computer Methods of	Structural Anal	ysis of Offshore		
			Structures	-				
Desire	d Requis	ites:	Structural Analysi	is, Structural Dynamic	S			
		~ .						
T 4	Teaching	Scheme	MCE	Examination Sche	me (Marks)	T 4 1		
Lectur	re	3 Hrs/week		15E	<u>ESE</u>	100		
			30	20 Credite:	30	100		
				Creuits.	5			
			Course	Objectives				
1	To give	an understand	ing to computer	aided design process	which includ	les mathematical		
I	represen	tation offshore st	tructures, Engineeri	ing Optimisation and I	Database system	IS.		
2	To ident	ify types of offsl	nore structure and it	s advantages.	-			
3	To enha	nce knowledge a	nd skills in offshore	e structure analysis wi	h modern com	outer methods.		
		Course	Outcomes (CO) wi	ith Bloom's Taxonon	ny Level			
At the	end of the	e course, the stud	ents will be able to	,				
CO		G			Bloom's	Bloom's		
		Course	e Outcome Statem	ent/s	Taxonomy	Taxonomy		
<u>CO1</u>	Framin		and af 2D 2D from a		Levels	Description		
C01	Examin	e the indetermination of the second	t offehore structure	es and structures.		Applying		
02	applicati	ons and advantag	ges.	es, based on functiona	III	Applying		
CO3	Analyse stiffness	the Planar orthomethod.	gonal and non-orth	ogonal structures using	IV IV	Analysing		
CO4	Illustra t method.	te the deflection	ns in planar truss s	systems using stiffnes	S IV	Analysing		
CO5	Evaluat	e the seismic p	performance of off	fshore structure using	⁵ V	Evaluating		
CO6	Solve th	e numerical on dy	vnamic analysis of c	offshore structures with	1			
	consider	ation of fatigue l	oads.	sindle subctures with	VI VI	Creating		
		6				1		
Modu	le		Module Co	ontents		Hours		
I	Indet	erminate structur	es, Space frames			6		
П	Stiffr ortho	ness method: Pla gonal structures	nar orthogonal strue	ctures, Stiffness metho	od: Planar non-	8		
III	Stiff	ness method: Plan	ar truss systems, Sti	ffness method: 3D anal	ysis	6		
IV	Туре	s of offshore strue	ctures, New-generati	ion offshore platforms		6		
V	Environmental loads, Dynamic analysis. Response spectrum 7					7		
VI	Anal	ysis under fatigue	loads, Random proc	cess		6		
	·							
			Tex	tbooks				
1	Arvio	l Naess and Tor	geir Moan. 2013. S	Stochastic dynamics of	f marine struct	ures, Cambridge		
-	Univ	ersity Press, New	York, USA.		<u>a</u>	<u> </u>		
2		rabarti, S. K. 198	/. Hydrodynamics o	of Offshore Structures:	Computational N	lechanics.		
3	Benja Wile	amin, JK and Cor y, New York.	neii, CA. 1970. Prot	badility, statistics and d	ecisions for civil	engineers, John		

4	Chakrabarti, S. K. 1990. Non-linear methods in offshore engineering, Elsevier Science Publisher, The Netherlands.					
	References					
1	ASTM E 1049-85. 2005. Rain flow counting method, 1987.					
2	Srinivasan Chandrasekaran and R. Nagavinothini. 2020. Offshore compliant platforms: Analysis, design and experimental studies, Wiley, U.K, Wiley, U.K, ISBN: 978-1-119-66977-7					
3	Srinivasan Chandrasekaran. 2019. Advanced steel design of structures. CRC press, Florida, ISBN: 978-036-72-3290-0					
4	Srinivasan Chandrasekaran. 2019. Structural Health Monitoring with application to offshore structures, World Scientific Publishing Co., Singapore, ISBN: 978-971-12-0108-0					
5	Srinivasan Chandrasekaran. 2018. Advanced structural analysis with MATLAB, CRC Press, Florida, USA, ISBN: 978-036-70-2645-5.					
Useful Links						

1 https://onlinecourses.nptel.ac.in/noc24_oe05/preview

CO-PO Mapping									
		Programme Outcomes (PO)							
	1	1 2 3 4 5 6							
CO1	3								
CO2		2	2						
CO3			3	2					
CO4			2		1	3			
CO5			2		1	3			
CO6		2		3		1			

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Assessment

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Walchand College of Engineering, Sangli								
(Government Aided Autonomous Institute)								
AY 2024-25								
Programme M Tech. (Civil Structural Engineering)								
Semester	•	Second Year M.	Tech, Sem III					
e Code		/\$1614		· · a ·	1			
e Name	• /	NPTEL Course -	Introduction to Eng	gineering Seismo	logy			
d Requis	ites:	Earthquake Engin	neering					
	<u> </u>							
Teaching	Scheme		Examination S	cheme (Marks)				
re	3 Hrs/week	MSE	ISE	ESE	Total			
		30	20	50	100			
			Cred	its: 3				
		~	0.1 1					
-		Course	Objectives					
To expla	in the principles	of plate tectonics a	and their correlation	i with seismic act	tivity, including the			
To apply	ation of plate bo	aismis ways shored	inpact on eartinguar	t soismis records	accurately thereby			
assessin	g earthquake inte	ensity, magnitude, a	and energy release	t seisinic records	accurately, thereby			
To apply	methodologies	to estimate seismic	hazard parameters,	such as seismic z	onation, attenuation			
relations	, and recurrence	e relations, enablir	g effective assessi	nent of earthqua	ke risk in specific			
regions								
	Course	Outcomes (CO) w	ith Bloom's Taxor	nomy Level				
end of the	e course, the stud	ents will be able to	,					
Underst	and the concept	of plate tectonics a	and its relation to se	ismic activity	Understanding			
Apply I	knowledge of so	eismic wave chara	cteristics to interp	ret earthquake	Applying			
Internr	t seismic record	s effectively using	earthquake instrum	entation	Annlying			
Apply r	redictive model	s to estimate seism	ic hazard parameter	ers for specific	rippiying			
regions.				sis for specific	Applying			
Create significa	tectonic maps us ince in assessing	sing earthquake ca seismic hazard	talogue data and u	nderstand their	Creating			
Analyse	seismic hazar	d using determin	istic and probabil	istic methods.	A 1 '			
integrati	ng rupture-based	l approaches and ca	se studies	,	Analysing			
		Mad-1-	ontonta		TT			
IC Fort	hauoko Harard	module C			nours			
Lart	duction to cont	anu Dasic Seismo	logy	and Colomia	-			
	uction to early	iquake nazarus- C	Forthqueles types	Electic Debour	х, d б			
	ry of Engineering	ng Selsmology and	teatonica and r	loto Doundonio	u o			
Cont	ry, Eartiquake	sources; Plate	tectomics, and F	Tate Boundarie	5.			
Soier	nie Wayos and I	Fnorm						
Theo	ry of Wave Pro	nagation Seismic	wave propagation	Types of seismi				
wave	s Wave characte	pagation Seisine	v zones	Types of seisin	6			
Conc	ent of Earthque	ake Measurement	Seismic Intensity	and Magnitude	s l			
Scale	s. Past earthqual	the Energy and Com	parable Explosive	tests				
Eart	hquake Instrum	entation	Paraele Explosive					
Earth	auake Instrume	its. Sensors and D	ata Loggers Mech	anical and Dioits	al 6			
sense	ors: Seismic Stat	ion Interpretation	of Seismic Records	: Identification	of			
made	events and nature	al earthquake. Tim	e and frequency do	nain characteristi	c			
of or	ound motion	a our inquitte, 1 IIII	e and frequency dol	num enuración isti				
Seisr	nic Zonation an	d Predictive Mod	els		6			
	amme Semester e Ode e Name d Requist Teaching re To explations identific To apply assessing To apply relations regions end of the Underst Apply I intensity Interprote Apply p regions. Create significa Analyse interprote Apply frequence regions. Create significa Analyse interprote Scont Theo Variation Seistration Senate interprote Seistration Seistration interprote Seistration interprote Seistration interprote interprote interprote interprote	Walc amme Semester e Code e Name d Requisites: Teaching Scheme re 3 Hrs/week Description of plate boo To explain the principless identification of plate boo To apply knowledge of sa assessing earthquake intee To apply methodologies of relations, and recurrence regions Course end of the course, the studd Understand the concept Apply knowledge of sa intensity and magnitude Interpret seismic record Apply knowledge of sa intensity and magnitude Interpret seismic record Apply knowledge of sa intensity and magnitude Interpret seismic record Apply predictive models regions. Create tectonic maps us	Walchand College (Government Aidea (Government Aidea AY 2) Course I amme M Tech. (Civil St Semester Second Year M. 7 e Code 7ST614 e Name NPTEL Course - d Requisites: Course Course Course Teaching Scheme re 3 Hrs/week MSE Course To explain the principles of plate tectonics a identification of plate boundaries and their i To apply knowledge of seismic wave charad assessing earthquake intensity, magnitude, a To apply methodologies to estimate seismic identifications, and recurrence relations, enablin regions Course Outcomes (CO) w end of the course, the students will be able to Understand the concept of plate tectonics a Apply knowledge of seismic wave charad intensity and magnitude Interpret seismic records effectively using Apply predictive models to estimate seismir regions. Create tectonic maps using earthquake ca significance in assessing seismic hazard Analyse seismic hazard and Basic Seismo Introduction to earthquake hazards- C History of Engineering Seismology and Theory; E	Walchand College of Engineering (Government Aided Autonomous Institut AY 2024-25 Course Information amme M Tech. (Civil Structural Engineering Semester Second Year M. Tech, Sem III e Ode e Ode 7ST614 e Name NPTEL Course - Introduction to Eng d Requisites: Earthquake Engineering Teaching Scheme Examination Si earthquake a Requisites: Earthquake Engineering Teaching Scheme Examination Si earthquake a Requisites: Earthquake Engineering Teaching Scheme Examination Si earthquake intensity re 3 Hrs/week MSE To explain the principles of plate tectonics and their correlation identification of plate boundaries and their impact on earthquak To apply knowledge of seismic wave characteristics to interpre assessing earthquake intensity, magnitude, and energy release To apply methodologies to estimate seismic hazard parameters, relations, and recurrence relations, enabling effective assess regions Course Outcomes (CO) with Bloom's Taxor end of the course, the students will be able to, Understand the concept of plate tectonics and its relation to se Apply knowledge of seismic wave characteristics to interprintensity and magnitude Interpret seismic records effectively using ear	Walchand College of Engineering, Sangli (Government Alded Autonomous Institute) AY 2024-25 Course Information anme M Tech. (Civil Structural Engineering) Second Year M. Tech, Sem III e Code 7ST614 e Name NPTEL Course - Introduction to Engineering Seismo d Requisites: Earthquake Engineering Teaching Scheme Examination Scheme (Marks) re 3 Hrs/week MSE Seteme Course Objectives To explain the principles of plate tectonics and their correlation with seismic actidentification of plate boundaries and their impact on earthquake occurrences To apply knowledge of seismic wave characteristics to interpret seismic records assessing earthquake intensity, magnitude, and energy release To use Outcomes (CO) with Bloom's Taxonomy Level To dure course, the students will be able to, Understand the concept of plate tectonics and its relation to seismic activity Apply knowledge of seismic wave characteristics to interpret earthquake intensity and magnitude Interpret seismic records affectively using earthquake instrumentation.			

	Regional Seismicity, Earthquakes in India and Most Important Global							
	Earthquakes; Concept of Seismic Zonation and Methodology for Seismic							
	micro-zonation, Predictive Models in Earthquake Engineering- Attenuation							
	Relation; Intensity, Duration and Ground Motion Predictive Relations							
	Seismotectonic Maps							
	Earthquake Catalog preparation, Source Map preparation; Homogenization							
v	and Declustering of earthquake data and preparation of Seismotectonic	7						
	maps Seismic Hazard Parameters: a and b values, Recurrence relations and							
	Maximum magnitude: Region Specific Approach for estimation Parameters							
	and Selection of predictive equations							
VI	Selsinic Hazaru Analysis Deterministic and Probabilistic Methods: Pupture based approach	0						
VI	Seismic Hazard Analysis Case studies and Worked examples	0						
	Seisine Hazard Analysis Case studies and worked examples							
	Textbooks							
1	A.K. Chopra, "Dynamics of Structure: Theory & amp; Application to Earthquake Engineering",							
1	Pearson Education Lim., 4 th Edition, 2014							
2	P. Agarwal and M. Shrikhande, "Earthquake Resistant Design of Structures", H	PHI publications,						
	New Delhi, 3 rd Edition, 2006							
3	D. J. Dowrick, "Earthquake Resistant Design for Engineers & amp; Architec	ts", John Wiley						
	& Sons,2 nd Edition, 1987							
	References							
1	David Key, "Earthquake Design Practice for Buildings", Thomas Telford Publ	ication, London,						
	2 Euliioii, 2000 Iomaa M. Kally, "Earthquaka Dagiatant Dagian with Dukhan". Saminglar Variag Dukliaatian							
2	London, 2 nd Edition, 2012							
3	3 Manual of "Earthquake Resistant Non-Engineering Construction", University of Roorkee, 2000							
Useful Links								
1	https://onlinecourses.nptel.ac.in/noc24_ce70/preview							

CO-PO Mapping									
	Programme Outcomes (PO)								
	1	2	3	4	5	6			
CO1			2						
CO2			3	2		3			
CO3	2			3		3			
CO4	2	1		2					
CO5		3			2				
CO6			2			2			
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High.									
Each CO	Each CO of the course must map to at least one PO.								

Assessment

The assessment is based on MSE, ISE, and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of a teacher's assessment. Mode of assessment can be field visits, assignments, etc., and is expected to map at least one higher-order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing).

Walchand College of Engineering, Sangli									
(Government Aided Autonomous Institute)									
Course Information									
Programme M. Tech. Structural Engineering									
Class. Semester Second Year M Tech Semester I									
Cours	e Co	ode	7ST615		-				
Cours	e Na	ame	NPTEL – Optin	nization Methods	for Civil Engineer	ing			
Desire	ed R	equisites:	Engineering Ma	thematics, Civil E	Engineering courses	s.			
	Teac	ching Scheme		Examination S	Scheme (Marks)				
Lectu	re	3 Hrs/week	MSE	ISE	ESE		otal		
Tutor	ial	-	30	20	50	1	00		
				Crea	Its: 3				
			Course	Objectives					
1	To	provide knowledge	course	objectives	ficance of optimiz	ation			
		impart knowledg	e of application of	pproach and sign	neance of optimiz	auon.	ing and		
2	10 solv	ving problems in a	ivil engineering fi	n opunization to	Jois required for	anaryZ	ing and		
		provide exposure	to modern techn	iques of global (optimization for o	ntimiz	ation of		
3	Pro	cesses/systems in	engineering field in	nques of global v i general.		punnz			
				- <u>B</u> errer wit					
		Course	Outcomes (CO) w	ith Bloom's Tax	onomy Level				
At the	end	of the course, the	students will be ab	ole to,	-				
CO1	Def	fine various optim	zation problems an	d techniques.		Reme	mbering		
CO2	Ex]	plain optimization	problems and tech	niques by classify	ing and relating	Under	standing		
<u> </u>	the	m.		. 1					
	diff	ferent methods	ined and constrain	ed optimization p	roblems using	Ap	plying		
CO4	Exa nor	amine various option	imization techniques in the techniques of the techniques of the technical section is the techniques of techniques	ues for solution o blems.	f linear,	Ana	lyzing		
CO5	Eva	aluate various opt	mization problems	in engineering fi	eld.	Eva	luating		
CO6	Cr	eate optimized g	obal engineering	designs of civil	engineering	0			
	faci	ilities having diffe	ent complexity.	0	8 8 8	Cr	eating		
Modu	ıle		Modu	le Contents			Hours		
Ι	Classical Optimization Techniques Introduction: Introduction to optimization, engineering applications of optimization, Formulation of structural optimization problems as programming problems. Optimization Techniques: Classical optimization techniques, single variable optimization, multivariable optimization with no constraints, unconstrained minimization techniques and algorithms constrained optimization solutions by penalty function techniques, Lagrange multipliers techniques and feasibility techniques						7		
П		Linear Programming: Linear programming, standard form of linear programming, geometry of linear programming problems, solution of a system of linear simultaneous equations, pivotal production of general systems of equations, simplex algorithms, revised simpler methods, duality in linear programming							
III		Non-linear progra minimization met section method, in Unconstrained op methods, descent	mming Non-linea hods, elimination terpolation metho imization method method.	r programming, or methods, Fibonac ds, quadratic and s, direct search m	one dimensional cci method, golder cubic methods, lethods, random se	n earch	7		

	Constrained optimization:	
	Constrained optimization techniques such as direct methods, the complex	
IV	methods, cutting plane method, exterior penalty function methods for structural	6
1 V	engineering problems. Formulation and solution of structural optimization	0
	problems by different techniques.	
	Ontimization by Metaheuristic Algorithms-I	
	Particle Swarm Ontimization Introduction Computational	6
	Implementation Solution of the Constrained Optimization Problem Ant	Ũ
	Colory Optimization, Docio	
	Colony Optimization, Basic	
	Undering Decompose Trail Evaporation Algorithm Examples Simulated	
	annealing Procedure Algorithm Features of the Method Ontimization	
	Ontimization by Metabeuristic Algorithms-II	
	Genetic algorithm Representation of design variables Representation of	
	Objective Europies and Constraints Constitution Objective Europies Algorithm flowshort	
VI	Design exemples. Further Set Theory, Ontimization of Further Systems	7
	Design examples. Fuzzy Set Theory, Optimization of Fuzzy Systems,	/
	Computational Procedure, Numerical Example, Neural-Network-Based	
	Optimization. Taguchi	
	Method.	
	Textbooks	
	Singiresu S. Rao "Engineering Ontimization-Theory and Practice" New A	
1	International	ge
	Publishers 2013 4th Edition	
2	Edwin P K Chong Stainslaw Zak "An Introduction to Ontimization" John Wi	lev &
_	Sons Inc. 2008	icy a
	5005, 110, 2000.	
	References	
1	M.S. Bazaraa, H.D. Sherali and C. Shetty, "Non-Linear Programming-Theory at	nd
1	Algorithms",	
	John Wiley and Sons, New York, 1993.	
2	Spunt, "Optimum Structural Design"- Prentice Hall, 2011	
Z		. 1 1
3	Du, Ke-Lin, Swainy, W. N. S., Search and Optimization by Metaneuristics", B	irknauser
	Basel-	
1	C L Day, Optimum Design of Machanical Elements, Wiley, 2007	
4	C.J. Ray, Optimum Design of Mechanical Elements, whey, 2007	
5	D. E. Goldberg, Genetic algorithms in Search, Optimization, and Machine Learni	ng,
	Addison-Wesley Longman Publishing, 1989.	
	TT 0-1 T * 1	
1	Userui Links	
1	https://nptel.ac.in/courses/103/103/103100121/	
2	Wab links and Video Lactures (a Desources):	
3	https://www.youtube.com/watch?v=wEdZI_KMM780&list=PI_wdpz1V30goXKK	h9n∆R
	DWYItTDgi37IYD	
	https://www.youtube.com/watch?v=GMTvoKRfxOw&list=PLGbiwaYC00hsv6X	KGalOB
	Aphm2tdeI bgK0 https://www.youtube.com/watch?y=fszNBvdfKrY	

CO-PO Mapping								
	Programme Outcomes (PO)							
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $							
CO1	1							
CO2	1		1					
CO3	1		2					
CO4	2		2			1		

CO5	2		3	2	1	1		
CO6	2		3	2	1	1		
The stren	ngth of mapp	oing is to be wr	itten as 1: Low, 2	2: Medium, 3: H	ligh			
Each CC	of the cours	se must map to	at least one PO.		-			
			Assessme	ent				
The asse	The assessment is based on MSE, ISE and ESE.							
MSE sha	all be typical	ly on modules	1 to 3.					
ISE shall	l be taken th	roughout the se	mester in the for	m of teacher's a	ssessment. Mode of	f		
assessme	ent can be fie	eld visit, assign	ments etc. and is	expected to ma	p at least one higher	r order PO.		
ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on								
modules 4 to 6.								
For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40%								
marks in	marks in ESE are needed. (ESE shall be a separate head of passing)							

	Walchand College of Engineering, Sangli										
	(Government Aided Autonomous Institute)										
	AY 2024-25										
Due and	Course Information										
Progra		e		1. Tech. Civ	$\frac{11 - Str}{M}$	uctural Eng	gineeri	ng			
Class,	Semo		3	econd year	M. Tec	in., Semesu	eriv				
Course		ne mo	/ /	SI092	Dhaga	r r					
Dogino	d Do	ne anicit			Phase I	r					
Dissentation Phase I											
Те	achir	ng Sel	heme			Evamina	tion S	cheme (Marks)		
Practic	cal	1 <u>g 50</u>		τ.Δ1		L'Annina LA2		F.	SE	Tote	 9]
Tacu	Cai	Hrs/	week	LAI				Ľ	5L	100	а
		111.5/	week	30		30			10	100)
				50		50	Cred	its: 17		100	,
							citu	1050 17			
					Cours	e Obiectiv	es				
1	To	analva	ze/experimen	t selected re	esearch	topic furth	er.				
-	To	revie	w classify	and consoli	idate c	hervation	/recul	te hased	on the d	atailed an	alvtical/
2	exp	erime	ntal work		iuaie c		, iesui	is based		ctaned and	arytical
3	To	docu	ment the res	earch work	in the	nrescribe	d for	nat and	nrecent it	effectively	v
	10	uocu	ment the res			presente	u ion		present n		y.
Course Outcomes (CO) with Bloom's Tevenomy Lovel											
At the end of the course, the students will be able to											
	CO Course Outcome Statement/s										
C01	Anı	nrise	analytical/ex	perimental	work	in detail t	for th	e selecte	ed research		
COI	nrol	hlem		permentai	WOIK		ior in	c selecti		Appl	lying
CO2	Cla	ssifv	and assess re	search outco	omes c	ritically				Anal	vsino
CO2		mnos	and conclu	de the resu	lts for	presentatio	n and	l dissert	ation repor	7 111u1	ysing
000	writ	ting.		ue the resu	101	presentatio	iii uiic		anon repor	Evalu	lating
CO4	Aut	thor a	research par	er/s and pul	blish in	reputed io	urnal/s	s as a cor	ntribution to		•
	eng	ineeri	ng fraternity.	1		1 5				Crea	ating
CO5	Inv	ent	comprehensi	ve solution	n lead	ting to s	ustain	able in	frastructur	C	
	dev	elopn	nent.			U				Crea	ating
		-									
					C	ontents					
Dissert	tation	Phas	e II will have	the analysis	s of the	research pr	oblem	based o	n defined o	ojectives. S	Students
will pr	resent	t their	r work in tw	o internal	phases	in front o	f eval	uation c	ommittee.	The end s	semester
evaluat	tion c	of the	complete wor	k will be car	rried o	ut with exte	rnal ey	kaminer.	The extern	al examine	r should
evaluat	te the	e stuc	lents based	on the com	pletion	n of work,	findi	ngs of t	he study, i	eport subi	mission,
contrib	oution	ns to t	he body of kr	nowledge (in	n the fo	orm of conf	erence	paper, j	ournal pap	r, patent) e	etc.
						_					
		• •			Re	eferences			~		
1	1	Natior -	hal and Intern	ational jour	mals, C	Conference	Procee	dings in	Structural	Engineerin	ıg.
2		l'echn	ical Reports	ot Professio	nal soc	cieties.					
3		ntern	ational and n	ational code	s of Pr	actices and	Hand	books.			
4		ntern	et sources and	d Distance I	Learnir	ig.	.				
5		Publis	hed Ph.D. an	d M. Tech	l'hesis	of Reputed	Institu	ites.			
		1			CO-P	O Mappin	g	(8)			
				•	Pr	ogramme (Jutco	mes (PC)) -		
	101		1	2		3		4	5	6)
	.01					2		2		3	5

CO2			2	2		3	
CO3	1		2			2	
CO4				2	3	3	
CO5			2	2	1	3	
The strength of manning is to be written as 1: Low 2: Medium 3: High							

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High Each CO of the course must map to at least one PO.

Assessment
There are three components of lab assessment, LA1, LA2 and Lab ESE.
IMP: Lab ESE is a separate head of passing (min 40 %), LA1+LA2 should be min 40%

.

Assessment	Based on	Conducted by	Typical Schedule	Marks			
LA1	Lab activities, attendance, journal	Lab Course Faculty	During Week 1 to Week 8 Marks Submission at the end of Week 8	30			
LA2	Lab activities, attendance, journal	Lab Course Faculty	During Week 9 to Week 16 Marks Submission at the end of Week 16	30			
Lab ESE	Lab activities, journal/ performance	Lab Course Faculty and External Examiner as applicable	During Week 18 to Week 19 Marks Submission at the end of Week 19	40			
Week 1 indicat	Week 1 indicates starting week of a semester. Lab activities/Lab performance shall include performing						

experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course.

Walchand College of Engineering, Sangli						
(Government Aided Autonomous Institute)						
AY 2024-25						
Course Information						
Programme	M. Tech. Civil - Structural Engineering					
Class, Semester	Second Year M. Tech., Semester IV					
Course Code	7ST645					
Course Name Internship						
Desired Requisites:	Courses taught in semester I and II					

Teaching Scheme		Examination Scheme (Marks)					
Lecture	-	LA1	LA2	ESE	Total		
Tutorial	-	-	-	100	100		
Practical	4 Hrs./Week	Credits: 2					

Course Objectives

To expose the students to real life engineering problems encountered in industry/society. 1 2

To provide an opportunity to work in collaborative and multidisciplinary environment.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO	Description	Blooms Taxonomy	
CO	Description	Descriptor	Level
CO1	<i>Perceive</i> knowledge of group dynamics and contribute to multidisciplinary work.	Understand	II
CO2	<i>Demonstrate</i> knowledge to solve societal problems and <i>apply</i> it for efficient management of projects independently and in teams.	Apply	III
CO3	<i>Communicate</i> with industry/society regarding engineering activities effectively and <i>comprehend</i> and write effective reports.	Understand	II
CO4	<i>Demonstrate</i> ethical behaviour with professional code of conduct and contribute to sustainable development of society.	Apply	III

Contents

The objective of this training is to expose the students to industry environment and practices. Students are sent to leading Engineering organizations/Research laboratories/Design and Consultancy organizations to undergo a rigorous training for a minimum period of one month during summer term/vacation.

6

2

CO-PO Mapping							
	Programme Outcomes (PO)						
	1	2	3	4	5		
CO1					2		
CO2				2			
CO3		2					

Assessment

CO4

- The assessment is based on ESE. The panel of minimum two members from the department shall 0 assess the student for the internship.
- The students are expected to present the work done in an internship tenure. 0
- The students shall also submit a detailed report based on activities done in an internship and learnings 0 through the same.
- The students shall also submit the duly signed internship certificate from the organization/s where 0 internship was done, clearly indicating the period of internship in the certificate.

AY 2024-25 Course Information Programme (M. Tech., Semester IV Course Code Course Name Techno-Socio Activity Desired Requisites: - Teaching Scheme Examination Scheme (Marks) Lecture - LA1 LA2 ESE Total Tutorial - 100 IOP Prevelop skills like teamwork, and communication through technical contribution on socio-economic issues Enhance understanding of the socio-economic impact of engineering projects and technology on society. Apply engineering knowledge and problem-solving skills to address real-world challenges Course Outcomes (CO) Apply engineering knowledge and problem-solving skills to address real-world challenges Course Outcomes (CO) Apply engineering knowledge and problem-solving skills to address real-world challenges Course Outcomes (CO) Apply engineering knowledge and problem-solving skills to address real-world challenges Course	Walchand College of Engineering, Sangli								
Course Information Programme M. Tech. Civil (Environmental Engineering) Class, Semester Second Year M. Tech., Semester IV Course Code Course Code Course Code Techno-Socio Activity Desired Requisites: - Teaching Scheme Examination Scheme (Marks) Lecture - Io0 100 Practical 2 Hs. Week - - 100 100 Practical 2 Hs. Week - - 100 100 Programine Develop skills like teamwork, and communication through technical contribution on socio- conomic issues - Credits: 1 Course Objectives - - - - - 2 Enhance understanding of the socio-economic impact of engineering projects and technology on society. Society. Blooms Taxonomy 2 Enhance understanding of the socio-seconomic impact of engineering projects and technology on society. Mapply engineering knowledge and problem-solving skills to address real-world challenges Course Outcomes (CO) Mathematical engineering broitering knowledge through participation in techno-socio assignments. Map	AV 2024-25								
M. Tech. Civil (Environmental Engineering) Class, Semester Second Year M. Tech., Semester IV Course Ode Course Rame Techno-Socio Activity Desired Requisites: - Teaching Scheme Examination Scheme (Marks) Lecture - 100 100 Protecting Scheme Examination Scheme (Marks) Lecture - 100 100 Protection Credits: 1 Course Objectives Interaction - Credits: 1 Course Objectives Interaction Credits: 1 Course Objectives Jechnance understanding of the socio-economic impact of engineering projects and technology on society. 3 Apply engineering knowledge and problem-solving skills to address real-world challenges Course Outcomes (CO) Description Belooms Taxonomy Description				Course	Information				
Class, Semester Second Year M. Tech., Semester IV Course Code Course Name Techno-Socio Activity Desired Requisites: - Teaching Scheme Examination Scheme (Marks) Leture - IOI Practical 2 Hrs/Week Total Interaction - - 100 100 Practical 2 Hrs/Week Credits: 1 Course Objectives Enhance understanding of the socio-economic impact of engineering projects and technology on sociely. 3 Apply engineering knowledge and problem-solving skills to address real-world challenges Course Outcomes (CO) Blooms Taxonomy Descriptor Level Col Description Blooms Taxonomy Descriptor Level	Progra	amme		M. Tech. Civil (E	Environmental Engi	neering)			
Course Code Techno-Socio Activity Desired Requisites: - Teaching Scheme Examination Scheme (Marks) Lecture - IA1 LA2 ESE Total Tutorial - - 100 100 Practical 2 Hrs./Week Interaction - Credits: 1 Course Objectives - - 100 100 Parkance understanding of the socio-economic impact of engineering projects and technology on society. - - Apply engineering knowledge and problem-solving skills to address real-world challenges - - Course Otocomes (CO) Description Blooms Taxonomy - Course Outcomes (CO) Explain professional culture/ethics and build proficiency in professional understand II communication, working in teams, decision making and leadership. Apply III CO1 Explain professional culture/ethics and build proficiency in professional understand II communication, working in teams, decision making and leadership. Apply III CO2 Apply the technical knowledge through participation in techno-socio activity Apply IIII CO3 Rowo	Class,	Semester		Second Year M.	Tech., Semester IV	<i>U</i> /			
Techno-Socio Activity Desired Requisites: - Teaching Scheme Examination Scheme (Marks) Lecture - Iotal Total Tutorial - - IoO IOO Practical 2 Hrs./Week Total Total Interaction - IO IOO IOO Practical 2 Hrs./Week Credits: 1 Image: Colspan="2">Course Objectives Course Objectives Credits: 1 Image: Course Course Course Course Course issues Enhance understanding of the socio-economic impact of engineering projects and technology on society. Apply engineering knowledge and problem-solving skills to address real-world challenges Course Outcomes (CO) At the end of the course, the students will be able to, Course Curomes (CO) Explain professional culture/ethics and build proficiency in professional Understand II apply if II communication, working in teams, decision making and leadership. Apply IIII CO3 Explain professional culture/ethics and build proficiency in professional Understand II in showledge gained. Apply IIII Course function in techno-socio activity (CO) Evaluate <	Course	e Code							
Desired Requisites: Teaching Scheme Examination Scheme (Marks) Lecture LA1 LA2 ESE Total Tutorial 2 Hrs./Week 100 100 100 Practical 2 Hrs./Week Interaction Credits: 1 Course Objectives Develop skills like teamwork, and communication through technical contribution on socio-economic insues Bhance understanding of the socio-economic impact of engineering projects and technology on society. 3 Apply engineering knowledge and problem-solving skills to address real-world challenges Course Outcomes (CO) At the end of the course, the students will be able to, Explain professional culture/ethics and build proficiency in professional Understand II C00 Description Blooms Taxonomy Descriptor Level C01 Explain professional culture/ethics and build proficiency in professional Apply III C02 Apply the technical knowledge through participation in techno-socio assignments. Apply III C03 Explain professional struture/ethics and suiting and leadership. Apply III C04 Explain professional entiture/ethics and build proficiency in pro	Course	e Name		Techno-Socio Ac	ctivity				
Teaching Scheme Examination Scheme (Marks) Lecture - LA1 LA2 ESE Total Tutorial - - 100 100 100 Practical 2 Hrs./Week Interaction - - 100 100 Course Objectives - - - 100 100 00	Desire	d Requisi	tes:	-					
Teaching SchemeExamination Scheme (Marks)Lecture-LA1LA2ESETotalTutorial100100Practical2 Hrs./Week-100100Interaction-Credits: I-Course Objectives-Credits: I-Course Objectives-Credits: I-Course Objectives2Enhance understanding of the socio-economic impact of engineering projects and technology on society.Biooms Tax-norryDescriptor3Apply engineering knowledge and problem-solving skills to address real-world challengesCourse Outcomes (CO)DescriptorBiooms Tax-norryDescriptorLevelCotExplain professional culture/ethics and build proficiency in professional assignments.Honorstrate findical quality and social responsibilities through the technical assignments.ApplyIIICO2Apply the technical knowledge through participation in techno-socio assignments.ApplyIIICO3Demonstrate ethical quality and social responsibilities through the technical knowledge gained.INoList of ActivitiesIINoNoII. Involvement in techno-socio activity a) Presentation on involvement in techno-socio activitya) statistical duality for the sacial duality individually/through student clubs during F.Y. & S.Y. M. Tech.NoNoD) Submission of certificates/documents required for student port-folio (Participation in									
Lecture-LA1LA2ESETotalTutorial100100Practical2 Hrs.Week100100Interaction-Credits: I1Develop skills like teamwork, and communication through technical contribution on socio- conomic issues-Credits: I2Enhance understanding of the socio-economic impact of engineering projects and technolegy on society <t< td=""><td>7</td><td>Teaching</td><td>Scheme</td><td></td><td>Examination S</td><td>cheme (Mark</td><td>s)</td><td></td></t<>	7	Teaching	Scheme		Examination S	cheme (Mark	s)		
Tutorial100100Practical2 Hrs./WeekCredits: 1Credits: 1Blooms Taxonomy DescriptionBlooms Taxonomy DescriptionCredits: 1Inderstand in techno-socio Apply the technical knowledge through participation in techno-socio assignments.Credits: 1Involvement in techno-socio activity a) Presentation on involvement in techno-socio activity individually/through student clubs during F.Y. & S.Y. M. Tech.b) Submission of summary report on these activities.InterverseReferenceCredit LinksCredit LinksInterverseInterverseCredit State of the course, the student scill club scill club scill club scill club scill clu	Le	cture	-	LA1	LA2	ESE	To	Total	
Practical 2 Hrs./Week Interaction - Credits: I Course Credits: I Course Develop skills like teamwork, and communication through technical contribution or socio- conomic issues socio- contribution or socio- economic issues a Develop skills like teamwork, and communication through technical contribution or socio- society. socio- contribution or socio- economic issues 3 Apply engineering knowledge and problem-solving skills to address real-world challenges society. Course Uttomes(CO) Elsentrip Elsentrip Cott Explain professional culture/ethics and build proficiency in professional communication, working in teams, decision making and leadership. Apply III Cott Explain professional culture/ethics and build proficiency in professional communication, working in teams, decision making and leadership. Apply III Cott Explain professional culture/ethics and build proficiency in professional communication quality and social responsibilities through the technical communication on involvement in techno-socio activity Apply III Cott Demonstrate ethical quality and social responsibilities through the technical is responsed activity/event for the benefit of society in a batch. b) Submission of summary report on these activities. Site of the course dun	Tu	torial	-	-	-	100	10	00	
Interaction-Credits: 1Credits: 2Credits: 2Credit: 2 <td>Pra</td> <td>ctical</td> <td>2 Hrs./Week</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Pra	ctical	2 Hrs./Week						
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	1	2	3	4	5	6	
CO1		3			3		
CO2			2		3		
CO3			2		3		

Assessment

The assessment is based on ESE. The panel of minimum two members from the department shall assess the student for the techno-socio activity.

The students are expected to present the work done in the four semesters.

The students shall also submit a detailed report based on activities done and learnings through the same.

The students shall also submit the duly signed certificate from the organization/s, local bodies where activities were carried out.