Programme	ASS D. HATTOMAN	AND THE OF TECHNOLOGY	THE WALLER W. T.				Na				chnology nal Importa	_	alaya				CURRIC	CULUM	
Course	P	rogramr	me Bachelor of Technology in Mechanical Engineering										Year of Regulation				2019-20		
Code	D	epartme	ent Mechanical Engineering									Semester				VI			
ME314 Mechanics of Composite Material Section Se	Co	urse				C	uraa Nam					Credit	Structure			Marks Di	stribution		
To introduce the application and types of composite materials. To develop the knowledge to apply generalized Hook's law in composite materials (Indextanding) Co2	Co	ode				<u> </u>	ourse man	ie			L	Т	Р	С	INT	MID	END	Total	
To develop the knowledge to apply generalized flooke's taw win composite materials. Course Cours	ME	314			Med	chanics o	f Compo	site Mate	rial		3	0							
Course Cour		no introduce the application and types of composite materials. COT materials(Understanding)											ding)						
Course To develop an ability to analyse bending of composite beams and plates. Course																			
No. Cot	Co	urse	To deve	lop th	the knowledge of classical laminated and first order theories.							CO3	(Applying)						
No. COS	Obje	ctives	To deve	lop ar	ability to	analyse be	ending of co	mposite be	eams and p	lates.	Outcomes	CO4							
No. COs PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 PS02 PS01		-		Able to developthe skill for b															
No. COS													Deanis ai	Means and places (Allaryzing)					
PO1	NIa	00-	Mapping with Program Outcomes (POs)													Mapping with PSOs			
CO2	INO.	COS	РО)1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Colsider Laminated Plate Theory Classification of structural theories assumptions, strain-displacement relation, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated Composite Plates Bending of laminated Composite Plates Total Hours Total	1		2		0	0	0	0	0	0	0	0	0	0	0	3	0	0	
CO4						_	_		_		-				_		+		
Code										-	+ -								
No. Content Moure Moure	•					_	_			-	+		+ -	_			<u> </u>		
No. Content Hours Cos			_				_				-		+ -		_	-	<u> </u>		
No. Content	0	000	0		<u> </u>	0	U	•	U	_		U		U	0	0	0		
Introduction Fibers and matrix, laminae and laminates, types, rule of mixture, applications, brief on manufacturing of composites III Basic of Composite Material Anisotropy, orthotropic and transversely isotropic material, generalized Hooke's law, characteristics of a unidirectional Lamina, transformation of stresses and strains, plane stress constitutive relations Classical LaminatedPlate Theory Classification of structural theories, assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic laminate V First-Order Theory of Composite Plates Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated Deams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Co2 Co3 Co4 Co3 Co4 Co3 Co4 Co5 Co5	No.															Hours	Hours COs		
Fibers and matrix, laminae and laminates, types, rule of mixture, applications, brief on manufacturing of composites Column																	CO1		
Fibers and matrix, laminae and laminates, types, rule of mixture, applications, brief on manufacturing of composites	ı	Introduction											05						
Basic of Composite Material Anisotropy, orthotropic and transversely isotropic material, generalized Hooke's law, characteristics of a unidirectional Lamina, transformation of stresses and strains, plane stress constitutive relations Classification of structural theories, assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic First-Order Theory ofComposite Plates Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias CO2 CO3 CO4 Total Hours Total Hours Sesential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition,CRC Press, 2004.	'	Fibers	and ma	atrix, I	aminae a	and lamina	ates, types	s, rule of r	nixture, ap	oplication	s, brief on r	manufact	turing of co	mposites		03			
Basic of Composite Material Anisotropy, orthotropic and transversely isotropic material, generalized Hooke's law, characteristics of a unidirectional Lamina, transformation of stresses and strains, plane stress constitutive relations Classification of structural theories, assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic First-Order Theory ofComposite Plates Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias CO2 CO3 CO4 Total Hours Total Hours Sesential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition,CRC Press, 2004.																			
II Anisotropy, orthotropic and transversely isotropic material, generalized Hooke's law, characteristics of a unidirectional Lamina, transformation of stresses and strains, plane stress constitutive relations Classification of structural theories, assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic First-Order Theory ofComposite Plates Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated Deams, governing equation, basics in bending of rectangular plates, Brief on failure criterias CO2 CO3 CO4 Total Hours Total Hours Sesential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.		Basic	of Com	nosi	te Mater	ial													
Classical LaminatedPlate Theory Classification of structural theories, assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic First-Order Theory ofComposite Plates Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Total Hours Total Hours 36 Essential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.	Ш	Anisot	ropy, or	thotro	opic and	transvers						characte	eristics of	a unidired	ctional	12		503	
Classical Laminated Plate Theory Classification of structural theories, assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic V First-Order Theory of Composite Plates		Lamina	a, transf	forma	ition of st	resses an	id strains,	plane stre	ess consti	tutive rela	ations								
Classification of structural theories, assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic restrictions, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic restrictions. Variable First-Order Theory of Composite Plates CO3		<u> </u>		• .														01	
motion, laminate constitutive equations, symmetric laminates, antisymmetric laminates, balanced and quasi isotropic laminate First-Order Theory of Composite Plates Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates Analysis of Laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Total Hours Total Hours Total Hours Total Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.							ssumption	s. strain-	displacem	ent relati	on. lamina	constitu	tive relation	ns. equat	ion of				
First-Order Theory of Composite Plates Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Total Hours Total Hours Total Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.	III	motion	i, lamina													08			
First-Order Theory of Composite Plates Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Total Hours 6 CO2 CO3 CO4 Total Hours 7 Total Hours 8 Essential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.		lamina	te																
Assumptions, strain-displacement relation, lamina constitutive relations, equation of motion, laminate constitutive equations, example with different types of laminates V Analysis of Laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Total Hours Total Hours 36 Essential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.		First (Sudau Ti	h a a m	, ofCom	nacita Di	ntoo												
V Analysis of Laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Total Hours Total Hours Total Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.	IV										itutive	05		04					
Analysis of Laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Total Hours Total Hours 56 CO3 CO4 Essential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.		equation	ons, exa	ample	with diff	erent type	es of lamin	ates											
Analysis of Laminated Composite Plates Bending of laminated beams, governing equation, basics in bending of rectangular plates, Brief on failure criterias Total Hours Total Hours 56 CO3 CO4 Essential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.																		`^2	
Total Hours Total Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.	V												.			06			
Total Hours 36 Essential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.	٧	Bendir	ng of lan	ninate	ed beams	s, governi	ng equation	n, basics	in bendin	g of recta	angular plat	es, Brief	on failure	criterias					
Essential Readings 1. J. N. Reddy, "Mechanics of Laminated composite plates and shells-Theory and analysis", Second Edition, CRC Press, 2004.		I						Total	Hours							36			
	Esse	ential Re	eadings	;											<u> </u>		<u> </u>		
2. R. Jones, "Mechanics Of Composite Materials", Second Edition, CRC Press, 1998.	1	. J. N.	Reddy,	"Мес	hanics of	f Laminate	ed compos	site plates	and shell	ls-Theory	and analys	sis", Seco	ond Editior	n,CRC Pre	ess, 2004.				
	2	. R. Jo	nes, "M	echa	nics Of C	omposite	Materials	", Second	Edition, C	CRC Pres	s, 1998.								

1. S. W. Tsai, J.D. D. Melo, "Composite Materials Design and Testing: Unlocking Mystery with Invariants", Second Edition, JEC Group, 2015.

Supplementary Readings