

National Institute of Technology Meghalaya

CURRICULUM

An Institute of National Importance

- U	epartm				Technold Engineer	ogy in Me ina	chanical	Enginee	ring			Y	ear of Re Seme			20 ⁴ VI	
Co	,	ent	meet	amear	Engineer	9					Credit	Structure			Marks Di	stribution	
Course Code		Course Name						L	T	P	С	INT	MID	END	Total		
ME	412			Co	mputatio	onal Fluid	Dynami	cs		3	0	0	3	50	50	100	200
		To introduce with CFD philosophy, pre-processing, post-processing and classification of PDEs								CO1	Able to <u>classify</u> PDEs governing fluid flows and examine the role of characteristics (Understanding)				nine the		
Course Objectives		To introduce discretization of partial differential equations using various schemes of finite difference method (FDM), finite volume method (FVM) and stream function vorticity approach							Course Outcomes	CO2 CO3	Able to <u>outline</u> the principles of discretization and illustrate common methods of discretization and infer on associated errors (Analzing). Able to <u>explain</u> numerical schemes, techniques and solution methodologies for solving discretized set of equations to obtain a stable solution (Analysing)						
		To introduce various iterative schemes for solving linearized algebraic equations, stability analysis of various schemes															
											CO4	engineeri	ng probler	overning ea ns and solv s (Applying	ring them u	fluid and th sing appro	priate
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No.	COs									comes (POs)				0010		ping with	
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1	CO1	3		0	0	0	0	0	0	0	0	0	0	0	2	0	0
2	CO2	3		0	0	0	0	0	0	0	0	0	0	0	2	0	0
3	CO3	3		2	0	0	0	0	0	0	0	0	0	0	2	0	0
4	CO4	3		0	2	0	0	0	0	0	0	0	0	0	2	U	U
								0	SYLLA	ABUS					Hours		COs
Content											110013	, 003					
I	fluid m of state	u notion and heat transfer, Conservation of mass, Conservation of momentain, Conservation of Shory, equations											CO1				
	Class	assification of Partial Differential Equations and Approximate Solutions : Mathematical classification of PDEs – irabolic, elliptic and hyperbolic equations, Role of characteristics in PDEs, Approximate solutions of differential juations, Primary and secondary variables, essential and natural boundary conditions															
11	parabo	olic, ellir	otic a	and hype	erbolic ec	uations,	Role of	characteri	istics in	PDEs, App	roximate	al classifica e solution:	ation of P s of diffe	DEs – rential	06		CO1
	parabo equation Funda	olic, ellip ons, Prir imental rocessin	nary a mary a s and	and hype and seco I Comm pes of b	erbolic econdary va	uations, riables, e	Role of ssential a scretizati , Conserv	characteri nd natura on : Princ vativeness	istics in al bounda	PDEs, App	roximate s n – prepi	e solution:	s of diffe	and	06 05		CO1 CO2
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