



Course wise Teaching Plan for Session : Summer 2019

Course : COMPUTATIONAL FLUID DYNAMICS Faculty : rachayya.arakerimath@raisoni.net - DR. RACHAYYA RUDRAMUNI

ARAKERIMATH

Unit	Topic Code	Topic Covered	Date	Course	Section
1	1	Syllabus Discussion, Discussion on course objective & course outcome	05/12/2018	MHPL509	A
1	1	Introduction to CFD	05/12/2018	MHPL509	A
1	2	Governing equations: the continuity equation, momentum equation and energy equations	06/12/2018	MHPL509	A
1	3	convective forms of the equations and general description, Reynolds transport theorem	08/12/2018	MHPL509	A
1	4	Classification of partial differential equations; physical examples of elliptic,	12/12/2018	MHPL509	A
1	1	Parabolic and hyperbolic equations. Mathematical nature of the flow equations & their boundary conditions	13/12/2018	MHPL509	A
1	5	Simple Numericals on above	15/12/2018	MHPL509	A
1	6	Review lecture	19/12/2018	MHPL509	A
2	7	Basic discretization techniques	20/12/2018	MHPL509	A
2	3	FEM in CFD, Numericals	26/12/2018	MHPL509	A
2	8	Basic discretization techniques applied to model equations and systems of equations: finite Difference, finite volume and finite element methods.	26/12/2018	MHPL509	A
2	9	Finite difference methods: Taylor series expansion, different means for formulating finite Difference equation.	27/12/2018	MHPL509	A
2	4	Accuracy of finite difference method,	29/12/2018	MHPL509	A
2	10	Accuracy of finite difference method,	29/12/2018	MHPL509	A
3	5	Central, upwind and hybrid formulations and comparison for convection -diffusion problem.	02/01/2019	MHPL509	A
2	11	Finite Volume Methods: Finite volume methods; approximation of surface and volume integrals, interpolation methods	02/01/2019	MHPL509	A
2	12	Analysis of numerical schemes: concept of consistency, accuracy, stability and convergence; Error and stability analysis; some applications	03/01/2019	MHPL509	A



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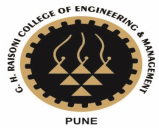
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2	13	Review lecture	05/01/2019	MHPL509	A
3	17	b) Elliptic generation systems.	05/01/2019	MHPL509	A
3	14	Introduction, Types	09/01/2019	MHPL509	A
3	15	Structured and Unstructured mesh generation techniques Structured grid generation:	12/01/2019	MHPL509	A
3	16	a) Algebraic method	16/01/2019	MHPL509	A
3	6	Voronoi diagram and Delaunay triangulation.	23/01/2019	MHPL509	A
3	18	Unstructured grid generation:	23/01/2019	MHPL509	A
3	19	b) Advancing front grid generation.	24/01/2019	MHPL509	A
3	20	Applications and advantages,	30/01/2019	MHPL509	A
3	21	Review lecture	31/01/2019	MHPL509	A
4	22	Introduction and applications	02/02/2019	MHPL509	A
4	23	Formulations of Euler equations, Numericals.	06/02/2019	MHPL509	A
4	24	High resolution schemes and TVD.	07/02/2019	MHPL509	A
4	25	Numericals on above	09/02/2019	MHPL509	A
4	7	Discretization methods for Euler equations.	13/02/2019	MHPL509	A
4	26	Review lecture	13/02/2019	MHPL509	A
5	27	Governing equations, Properties of Navier -Stokes equations;	13/02/2019	MHPL509	A
5	28	Discretization of NS equations; Boundary conditions;	14/02/2019	MHPL509	A
5	29	Convergence acceleration techniques.	16/02/2019	MHPL509	A
5	8	Numericals and derivations	20/02/2019	MHPL509	A
5	30	Review lecture	20/02/2019	MHPL509	A
6	31	Introduction and applications, Statistical representation of turbulent flows:	23/02/2019	MHPL509	A
6	32	General Properties of turbulent quantities,	27/02/2019	MHPL509	A



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6	33	Closure problem: Necessity of turbulence modeling,	28/02/2019	MHPL509	A
6	34	Reynolds average Navier stokes (RANS) equation,	02/03/2019	MHPL509	A
6	35	Different types of turbulence model,	06/03/2019	MHPL509	A
6	36	Tests-1- Midterm Test	07/03/2019	MHPL509	A
6	37	Numericals.	09/03/2019	MHPL509	A
6	38	Test-2 -End term test	14/03/2019	MHPL509	A
6	39	Review lecture	16/03/2019	MHPL509	A
6	40	Practice Session	23/03/2019	MHPL509	A