



TCET/FRM/IP-02/09

Revision: A

Bridge Course (CFD) Plan
Computational Fluid Dynamics

Semester: VII

Class: BE-Mech

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned / Completion Date	Resource Book Reference	Remarks
1	Module 1	L 3.1	Introduction to CFD	Whiteboard, Marker	24/07/2017	1.1	
2		L 3.2	Definition and overview of CFD, need, Advantages of CFD, Numerical vs Analytical vs Experimental, Applications of CFD, CFD methodology, grid independence, Verification and validation	Whiteboard, Marker	27/07/2017	1.1	
3	Module 2	L 3.3	Governing equations of mass, momentum and energy	Whiteboard, Marker	31/07/2017	1.1,2.1	
4		L 3.4	Boundary Conditions – Dirichlet, Neuman, Robbins, initial conditions, mathematical behavior of partial differential equations – Elliptic, parabolic & hyperbolic equations, impact on CFD	Whiteboard, Marker	3/08/2017	1.1,2.1	
5		L 4.1	Discretisation methods	Whiteboard, Marker	07/08/2017	1.1,2.1	
6		L 4.2	Finite Difference method	Whiteboard, Marker	10/08/2017	1.1	
7	Module 3	L 4.3	Finite volume method for diffusion problems (Conduction):	Whiteboard, Marker	14/08/2017	1.1,2.1	
8		L 4.4	Solution algorithms for pressure velocity coupling in steady flows	Whiteboard, Marker	24/08/2017	1.1,2.1	
9		L 5.1	Turbulence modeling	Whiteboard, Marker	31/08/2017	1.1,2.1	
10		L 5.2	Test		31/08/2017		
11	Module	L 8.1	Introduction to Grid Generation	Whiteboard,	4/09/2017	1.1	

	4			Marker			
12		L 8.2	Structured and Unstructured Grids, General transformations of the equations, body fitted coordinate systems	Whiteboard, Marker	7/09/2017	1.1,2.1	
13		L 10.1	Develop computer codes for simulation of heat transfer and fluid flow problems.	Matlab	11/09/2017	1.1	
14	Module 5	L 10.2	Implement of CFD process by using CFD software	Ansys	14/09/2017	1.1, 1.2	
15		L 10.3	Steady state one dimensional heat conduction with or without heat generation, different boundary conditions, Multi-solid heat conduction, Non-linear Heat Conduction, Unsteady heat conduction, two dimensional steady and unsteady heat conduction	Ansys	18/09/2017	1.1, 1.2	
16		L 10.4	Laminar Pipe Flow	Ansys	21/09/2017	1.1,1.2	
17		L 11.1	Turbulent pipe flow	Ansys	21/09/2017	1.1,1.2	
18		Module 6	L 11.2	Flow over a flat plate	Ansys	25/09/2017	2.2
19	L 12.1		Flow over an aerofoil	Ansys	25/09/2017	2.2	
20	L 12.2		Test		5/10/2017		
Remark: Course:	Syllabus Coverage:			Practice Session:		Beyond Syllabus:	
No. of (lectures planned)/(lectures taken):20/							

Note:

1. Plan date and completion date should be in compliance.
2. Course are required to be taught with emphasis Text books, digital references etc.

Text Books:

1. S V Patankar, Numerical Heat Transfer and Fluid Flow, Special Indian 1 st Edition,.
2. H K Versteeg and W. Malalasekera, An Introduction to Computational Fluid Dynamics Education, 2008
3. John. D. Anderson, Jr., Computational Fluid Dynamics - The basics with applications

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Name & Signature of Faculty

sd/-
Signature of HOD

sd/-
Signature of Principal/Dean(Academic)

Date:

Date:

Date: