Programme schedule of short term course on

Modelling Energy Systems using CFD: Theory and Practice

1 - 7 July, 2017, Mechanical Engineering, IIT (B.H.U), Varanasi, U.P, India

Day↓ Time→	9.30-10.00	10.00-10.45		11.00-1.00		2.00-3.00	3.00-4.00		4.10-5.30	5.30 - 6.00
DAY 1: Saturday (1st July)	**Registration & Inauguration**			**Energy system designs**		**Computer Aided Design (CAD)**			**CFD Pre-Processing techniques**	
	VENUE: New Seminar Hall, Dept. of Mechanical Engineering **VENUE** for rest of the classes: CAD lab			How to freeze without any external energy source?		3D parts design and assembly			Surface features, organising, Surface/volume mesh generation etc	
DAY 2: Sunday (2nd July)	**Overnight assignment**	**Differential equations**		**Scale analysis**		**Mesh generation and CFD models**			**CFD model: solar energy system**	
	Review and solution	Types and background		Laminar/Turbulent flows: order of magnitude method for differential equations		Boundary layer mesh generation techniques: LDC+Cylinder	Developing CFD model and post-processing techniques		Aerodynamic CFD: Wind tunnel, pressure loads, lift and etc.	
DAY 3 Monday (3rd July)	**Overnight assignments**	**CFD Theory**		**Scale analysis**		**Building Designs**			**CFD Modelling**	
	Review & solution	Solution techniques of differential equations		Order of magnitude method for natural convection		Boundary conditions, Natural ventilation, effect of boundary layer etc.; LDC			Mesh Generation, boundary conditions etc	
DAY 4 Tuesday (4th July)	**Overnight assignment**	**Theoretical background**		**Air/Liquid flat plate collector**		**Hybrid PV-Thermal collectors**			**Hybrid PV-Thermal collectors**	
	Review & solution	Solar energy systems		Designs and CFD models		Designs and CFD models			PCM + Conjugate HT + Other materials	
DAY 5 Wednesday (5th July)	**Overnight assignment**	**Multiphase flows**		**Gravity driven flows -I**		**Gravity driven flows-II**			**Melting and Solidification**	
	Review & solution	Volume of Fluid/Eulerian/Lagrangian flows		Modelling water-air interface: full air volume fraction		Modelling water-air interface: user defined function/open channel flows			Modelling Phase Change materials (PCM), heat storage	
DAY 6: Thursday (6th July)	**Overnight assignment**	**Reverse Engineering:**		**Geometry from Scanned data**		**How to shoot 2D still images?**			**Converting 2D still images into 3D CAD**	
	Review & solution	Why and how with CAE		Post-processing techniques for .stl scanned geometry		Best practices, Handling images 3D CAD conversion			Photo aligning, building mesh and texture, developing CFD/FEM models	
DAY 7: Friday (7th July)	**Overnight assignment**			**Valedictory function: 11.00 – 11.30 AM**						
	Review & solution			Feedback and vote of thanks **VENUE:** New Seminar Hall						
			TEA		**LUNCH**			**TEA**		**OVERNIGHT ASSIGNMENTS**