Programme schedule of short term course on

Product Design and Innovation using CFD and FEM

27-31 December 2016, Department of Mechanical Engineering, IIT (B.H.U), Varanasi, U.P

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: Tuesday (27th Dec)	**Registration & Inauguration**			**Product Design and Innovation**		**Computer Aided Design (CAD)**			**CAD post-processing**	
	VENUE: New Seminar Hall, Dept. of Mechanical Engineering **VENUE** for rest of the classes: CAD lab			Intellectual Property Rights (IPR)		Parts design and assembly			Geometric features and CAE pre-processing techniques	
DAY 2: Wednesday (28th Dec)	**Overnight assignment**	**CFD Theory**	T E A	**Scale analysis**	L U N C H	**Mesh generation and CFD models**		T E A	**How and why: 2D CFD model**	O V E R N I G H T A S S I G N M E N T S
	Review and solution	Differential equations and solution techniques		Laminar/Turbulent flows: order of magnitude method for differential equations		Boundary layer mesh generation techniques	Developing CFD model and post-processing techniques		**Automotive/Aerospace:** Aerodynamic CFD: Wind tunnel, lift and drag forces etc.	
DAY 3: Thursday (29th Dec)	**Reverse Engineering: Why and how with CAE**			**Geometry from Scanned data**		**CFD model for porous medium**			**Concept of interface modelling**	
	Overnight assignment	Reverse Engineering		Post-processing techniques for .stl scanned geometry		Theory, building ventilation design etc			Conjugate heat transfer modelling techniques	
DAY 4: Friday (30th Dec)	**Overnight assignment**	**FEM Theory**		**Linear Static and Dynamic Analysis**		**Design Optimization**			**1D, 2D or 3D: How and Why?**	
	Review and solution	Subdomain, Galerkin, Petrov-Galerkin, Least square, Collocation, Weak form etc.		Mesh quality and checks, stresses in critical region, design based on dynamics responses etc.		Topology optimization with constraints mass, stiffness, frequency etc.			1D, 2D or 3D FEM: Same result, different method?	
DAY 5: Saturday (31th Dec)	**How to shoot 2D still images?**			**2D image conversion into 3D CAD**		**Hands-on project**			**Valedictory function**	
	Review of overnight assignments	Best practices for taking still images		Handling images; photo aligning, building mesh and texture, developing CFD/FEM models		Evaluation and review			Feedback and vote of thanks **VENUE:** New Seminar Hall	