

Annexure 'C'

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DESIGN AND MANUFACTURING (IIITDM) KANCHEEPURAM

Course Title	Mass transfer in industrial applications	Course No			
Specialization	Mechanical Engineering	Structure (IPC)	3	0	3
Offered for	UG, DD and PG students (Mechanical)	Status	Core <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>	
Pre-requisite	Basics of Heat transfer and fluid mechanics	To take effect from			
Objectives	<p>To enable the students to get familiarized with the concepts of mass transfer, its governing laws and analogies.</p> <p>To apply the concepts of diffusion mass transfer, mass transfer coefficients, convective mass transfer, inter-phase mass transfer and solve relevant design problems in various fields.</p>				
Course Outcomes	The students will gain knowledge in mass transfer processes and the influence in operations and equipment design.				
Contents of the course	<p>Mass Transfer Concepts, Composition Relationships, Fick's Law, Diffusion in Stationary medium Mass Diffusion Equation, Boundary conditions, Binary Mixtures - Air-Water Vapor Mixture (7)</p> <p>Mass convection - Laminar and turbulent flow, Analogy between friction, heat and mass transfer coefficient - Transient Diffusion, Multiphase mass transfer and Multicomponent mass transfer (8)</p> <p>Simultaneous heat and mass transfer – humidification and dehumidification – Dry and Wet coil - Effectiveness-NTU Relations (5)</p> <p>Mass transfer in near vacuum conditions - Freeze Drying and vacuum frying – Boundary condition - Mass Diffusion with Homogeneous Chemical Reactions (10)</p> <p>Discontinuous Concentrations at Interfaces – Evaporation, Sublimation, Drying - Solubility of Gases in Liquids and Solids - Catalytic Surface Reactions – Boundary conditions (12)</p>				
Text	<ol style="list-style-type: none"> 1. Koichi Asano, Mass Transfer, Wiley, 1stEdn, 2006 2. T.L. Bergman, A.S. Lavine, F.P. Incropera and D. P. Dewitt, Fundamentals of Heat and Mass Transfer, 7thEdn, John Wiley, 2011 				
References	<ol style="list-style-type: none"> 1. R.E. Treybal, Mass-Transfer Operations, 3rdEdn, McGraw-Hill Book Company, 1980 2. D. Basmadjian Mass Transfer - Principles and Applications, CRC, 2005 3. A.S. Mujumdar, Handbook of Industrial Drying, 4thEdn, CRC, 2014 				