

PROFESSOR'S NAME	Prof. Rabibrata Mukherjee
DEPARTMENT	Chemical Engineering
INSTITUTE	IIT Kharagpur
COURSE OUTLINE	<p>Introduction This is an introductory material and energy balance course that plays significant role in the chemical engineering as well in the biological, petroleum, and environmental engineering curriculum. It enables students to be conversant with the engineering approaches for solution of the process-related problems, with and without chemical reactions. The content of this course can be broadly classified into two topics: (1) material balances, and (2) energy balances.</p> <p>Learning Outcome Objective: To learn the formulation and interpretation of material and energy balances on various chemical process schemes. Outcome</p> <ol style="list-style-type: none"> 1. Students will be acquainted with the problem-solving skills in a systematic manner for diverse process-related units. 2. Students will be able to determine the relations between the given and unspecified process variables. 3. Students will be confident with necessary skill-sets for understanding and elucidating complex process problems related to chemical engineering and allied areas, which will help them to design and operate various unit operations/processes. <p>Course outline Introduction: Engineering calculations, Processes and Process variables; Material balance calculations: Fundamentals and multiple units; Recycle and Bypass; Chemical reaction stoichiometry; Reactive processes, single phase and multiphase systems Basic concepts and terminologies; First law of thermodynamics, First law of thermodynamics in the rate form; Estimation of</p>

	<p>physical parameters; Energy balance without chemical reaction; Concepts of heat of formation, Heat of reaction;</p> <p>Energy balance with chemical reaction; concepts related to humidity, Psychrometric chart and humidity calculations.</p>
--	---

COURSE DETAILS			
Sl. No	Module ID/ Lecture ID	Lecture Title/Topic	Duration
1	G23-Mod1	Introduction to Energy Balance: Basic Concepts and Terminology 1	0:40:48
2	G23-Mod2	Introduction to Energy Balance: Basic Concepts and Terminology 2	1:00:47
3	G23-Mod3	Introduction to Energy Balance: Basic Concepts and Terminology 3	1:05:16
4	G23-Mod4	Basic Understanding about Process	1:06:31
5	G23-Mod5	Different Components of Energy of a Systems	0:31:58
6	G23-Mod6	Discussion on Internal Energy 01	0:43:53
7	G23-Mod7	Discussion on Internal Energy 01	0:31:40
8	G23-Mod8	Energy Balance without Chemical Reaction - 1	0:51:39
9	G23-Mod9	Energy Balance without Chemical Reaction - 2	0:52:15
10			

