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Department of Chemical Engineering	
Mass Transfer (64361)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : Heat Transfer (64232) OR Heat Transfer Operations (64334)

Course Contents

1- Principles of Mass Transfer (5 weeks): Introduction to mass transfer and diffusion, molecular diffusion in gases, molecular diffusion in liquids, molecular diffusion in biological solutions and gels, molecular diffusion in solids,. 2- Principles of Convective Mass Transfer 5 weeks): Convective mass transfer coefficients, mass transfer coefficients for various geometries, mass transfer to suspensions of small particles, diffusion of gases in porous solids and capillaries 3- . Stage and Continuous Gas-Liquid Separation Processes (5 weeks): Types of separation processes and methods, equilibrium relations between phases, single and multiple equilibrium contact stages, mass transfer between phases, absorption in plate and packed towers, absorption of concentrated mixtures in packed towers, estimation of mass transfer coefficients for packed towers,

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	At the end of this course students will be able to Apply knowledge of mathematics, science, &engineering in mass transfer and separation processes.	A	20 %
2	At the end of this course students will be able to Identify, formulate, &solve engineering problems related to diffusion coefficient, and mass transfer coefficients for solid, liquid and gas systems.	E	40 %
3	At the end of this course students will be able to Design a system, component, or process where the two-phase mass transfer process takes place.	C	40 %

Textbook and/ or Refrences

C. J. Geankoplis, Transport Processes and Separation Principles, 4th Ed., Prentice-Hall Inc., New Jersey, 2003. References 1- W. L. McCabe, J. C. Smith and P. Harriott, Unit Operations of Chemical Engineering, 6th ed., McGraw-Hill, Inc., New York, 2001. 2- Jaime Benitez, Principles and Modern Applications of Mass Transfer Operations, 2nd edition, John Wiley &Sons, 2009. 3- Koichi Asano, Mass Transfer. From Fundamentals to Modern Industrial Applications, 2006 WILEY--VCH

Assessment Criteria	Percent (%)
First Exam	25 %
Second Exam	25 %
Homeworks	10 %
Final Exam	40 %

Course Plan

Week	Topic
1	Introduction to mass transfer
2	Molecular diffusion in gases
3-4	Molecular diffusion in liquids
5	Molecular diffusion in solids First Midterm Exam
6	Convective mass transfer coefficient

7-9	Mass transfer coefficient for various geometers
10	Diffusion of gases in porous solids and capillaries Second Midterm Exam
11	Types of separation processes and methods
12	Equilibrium relations between phases
13	Single and multiple Equilibrium contact stages
14	Design of packed tower
15	Design of packed bed using transfer unit
16	Final Exam