VIDHYADEEP UNIVERSITY
Holy Flame of Knowledge

SECOND-YEAR DIPLOMA CHEMICAL ENGINEERING SYLLABUS

Semester: 4TH

Course Code Lab: 002206404 **Type of Course:PCC-LC-7**

Course Name:Mass Transfer-I

Course Prerequisites: The operations which involve changes in composition of solutions are known as the mass- transfer operations. Mass transfer operations are required for preliminary purification of raw materials or final separation of products from by-products. Mass transfer operations are major and important activity in most of the chemical plants. Hence the course has been designed to develop the following competency and its associated cognitive, practical and affective domain learning outcomes.

COURSE OBJECTIVE(S):

The course should be taught and curriculum should be implemented with the aim to develop required skills so that students are able to acquire following competency: Use chemical process plant equipments for mass transfer operation safely.

TEACHING & EXAMINATION SCHEME:

Teaching Scheme (Hrs/Week)				Examination Scheme					
				SEE		CA			Total
Theory	Tutorial	Practical	Credit	Th	Pr	MSE	PLE	LA	
0	0	4	2	0	50	0	0	50	100

SEE: Semester End Examination; CA: Continuous Assessment; Th: Theory; Pr: Practical; MSE: Mid Semester Examination; PLE: Participatory Learning Experience; LA: Laboratory Assessment

*TOTAL Practical Hours: No. of Pr. and Prt.Hrs/Week*15 = 60*

LIST OF PRACTICALS: *(sample for 4 hrs/week)*15 weeks*

Sr. No.	Content	Unit No.	Time Duration
1	Describe different methods for conducting mass transfer operation (study experiment)	1	4
2	Determine diffusivity of gas-liquid system at room temperature	2	4
3	Determine diffusivity of gas-liquid system showing its dependency on temperature	2	4
4	Determine diffusivity of liquid-liquid system at room temperature	2	4
5	Determine diffusivity of liquid-liquid system showing its dependency on temperature	2	4
6	Prepare drying curve of moist sand and moist limestone	4	4
7	Find out equilibrium moisture content and drying time of wet solid	4	4
8	To determine the drying characteristic for rotary dryer.	4	4
9	Determine the efficiency of single stage extraction	5	4
10	Determine the efficiency of two stage cross current extraction	5	4

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11	Determine the distribution coefficient for toluene- acetic acid & chloroform -acetic acid mixture	5	4
12	Prepare ternary diagram for a system of three liquids	5	4
13	Obtain tie-line data for Acetic Acid, Benzene and water	5	4
14	Measure recovery of salt using sand-salt mixture in single stage leaching	6	4
15	Describe different methods for steady state leaching operations. (study experiment)	6	4
		TOTAL	60

Text Book(s):

Title of the Book	Author(s)	Publication
Unit Operations-II	K. A. Gavhane	NiraliPrakashan, Pune, 2009
Mass Transfer Operations-I	K. A. Gavhane	NiraliPrakashan, Pune, 2009

Reference Book(s):

Title of the Book	Author(s)	Publication
Mass Transfer Operations	Robert E. Treybal	Mc Graw- Hill, 3 rd Edition, 1981
Unit Operation of Chemical Engineering	McCabe, Warren L., Julian C. Smith	McGraw Hill Publication, New York 2004, 7th Edition
Unit Operations of Chemical Engineering, Volume-1	P. Chattopadhyay	Khanna Publishers, New Delhi, 1995

Web Material Link(s):

(a) www.unitoperation.com
(b) www.nptel.com

Equivalent/Corresponding Course on NPTEL (SWAYAM):

PRACTICAL EVALUATION:

Sr. No.	Activity	Marks	Weightage
1	Semester End Examination (External Practical)	50	60%
2	Continuous Assessment Practical (CAP)	50	40%
	Semester End Examination (External Practical)		
1(a)	Lab Experiment/Exercise		30%
1(b)	Viva-voce		20%
1(c)	Certified Record		10%
	Continuous Assessment Practical (CAP)		
2(a)	Day to day Laboratory Work & Attendance		15%
2(b)	Submission of Laboratory Work/Journal		10%
2(c)	Exam		15%

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* For 5 Credit Subjects

1 Credit = 25 Marks
Theory: 3 Credits = 75 Marks
Practical: 2Credit = 50Marks
SEE Evaluation will be of 100 marks and converted to 50 Marks (75 Th + 25 Pr)
CA Evaluation will be of 100 Marks and converted to 50 Marks. (75 Th + 25 Pr)

Distribution of Marks for Theory Evaluation as per Bloom's Taxonomy Level:

Level	Remember	Understand	Apply	Analyze	Evaluate	Create
% Weightage	13%	37%	20%	10%	10%	10%

COURSE OUTCOMES:

CO1	Understand basics of Mass Transfer operation.
CO2	Use concept of diffusion in Fluids & Interphase mass transfer in separation techniques
CO3	Select mass transfer operations (Drying & extraction) equipment for various applications.
CO4	Compute material balance for mass transfer operations (Drying & extraction) in different condition.