

Branch

CHEMICAL

Semester

6

Course Code

Course Name

SEPARATION PROCESSES II

Course Outcome 1	Student will be able to Monitor environment and working parameters of humidifying and de humidifying apparatus	Teach Hrs	Marks
Learning Outcome 1	Student will be able to Identify the method of expressing relative saturation of air.	11	15
Contents	Humidification and Dehumidification: Definition and Terminology, Absolute Humidity, Molal Humidity, Relative and Percentage humidity, Definition and expression for them. Relation between Percentage and Relative humidity. Humid heat and Humid volume. Enthalpy for pure substances and Total enthalpy, VLE and Dew point, Adiabatic saturation temperature, Equation for adiabatic cooling lines, Wet bulb and Dry bulb temperature, Difference between adiabatic saturation temperature and wet bulb temperature. Theory of wet bulb temperature, Relation of wet bulb and dry bulb temperature with humidity and other thermal properties of air		
Method of Assessment	Theory Exam(external)		
Learning Outcome 2	Student will be able to operate humidifying and dehumidifying equipments and use humidity chart	10	15
Contents	Psychrometric chart and its application , Lewis relation, Measurement of Humidity, Psychometric and hygrometric method: Wet bulb Temperature and Dew point temperature psychometric method. Cooling Tower: Classification, Operations and working details, Applications, Industrial Humidifier: Operations and working details, Numerical problems based on humidity of air, Psychometric chart		
Method of Assesment	Theory Exam(external)		
Learning Outcome 3	Student will be able to determine properties of air and operate humidifying equipment.	9	10
Contents	Determination of different properties of air by dry bulb temperature method and de point method, operation of cooling tower and humidifier		

Method of Assessment	Laboratory test by observations(external)		
Course Outcome 2	Student will be able to Operate various types of drying equipments and control conditions required for optimum drying		
Learning Outcome 1	Student will be able to Identify different types of moisture and their role in drying	14	15
Contents	Drying: Definitions, Bone dry solid, Moisture content (wet and dry basis), Free and Equilibrium moisture , Bound and Unbound Moisture, Equilibrium between drying air and moisture content of solids, Direct and Indirect Dryer, Batch and Continuous Dryer, Mechanism of air solid contacting in dryer: Cross circulation, through circulation, shower drying, fluidized bed drying and pneumatic conveying. Rate of drying, Constant drying conditions, Conditions of drying air affecting drying rate, Nature of material affecting drying rate: mechanism of moisture movement within a solid, Constant and falling rate period, critical moisture content, Calculation of total drying time for cross circulation drying. shrinkage and casehardening		
Method of Assessment	Theory Exam(external)		
Learning Outcome 2	the students will be able to understand and describe drying mechanism in different dryers.	8	10
Contents	Application, Features, Construction, Working, Advantages and Disadvantages of following dryers: Tray dryer, Truck dryer Tunnel dryer, Rotary dryer, Drum dryer, Double drum dryer, cylinder dryer, fluidized bed dryer, and spray dryer		
Method of Assessment	Theory Exam(external)		
Learning Outcome 2	Students will be able to operate drying equipments.	6	10
Contents	Plot drying rate curve for drying of in a tray dryer and fluidized bed dryer and rotary dryer and calculate drying time, Determine the Critical Moisture Content of a given material & find out its equation for constant and falling rate period		
Method of Assessment	Laboratory test by observations(external)		
Course Outcome 3	Student will be able to classify and compare different mechanism of crystallization and the equipments used in crystallization		

Learning Outcome 1	Students will be able to understand mechanism of crystallization.	9	10
Contents	Crystallization: Introduction, Saturated and super saturated solutions, Crystallization from vapour, liquid melt and solution, Solubility Curve, Importance and objective of industrial crystallization, Theory of solubility and crystallization : Methods to achieve super saturation: Cooling a solution or melt, Evaporation, Adiabatic evaporative cooling, salting , precipitation, Crystal geometry, lattice arrangement, some common crystal shapes		
Method of Assessment	Theory Exam(external)		
Learning Outcome 2	Student will be able to Select methods to achieve super saturations of solution.	11	20
Contents	Crystallization Process: Nucleation and Crystal Growth, Methods of nucleation: Classification, Spurious and Primary nucleation, Secondary nucleation types of primary and secondary nucleation, Mechanism of Crystal Growth : Miers theory and Delta L (ΔL) law, Effect of heat on size and growth of crystal, Particle Size Distribution of Crystals, Crystallizing Equipments: Agitated batch crystallizers, Swenson Walker crystallizers, Batch and Continuous vacuum crystallizers Caking of crystals and its prevention, Numerical problems		
Method of Assessment	Theory Exam(external)		
Learning Outcome 3	Student will be able to Determine the crystal yield.	9	10
Contents	Determination of crystallizer yield, and construction and operation of agitated batch crystallizer and Swenson Walker Crystallizer		
Method of Assessment	Laboratory test by observations. (external)		
Course Outcome 4	Student will be able to separate efficiently different components of a mixture by using leaching methods		
Learning Outcome 1	Identify the primary variables and parameters that determine the performance of leaching operations	5	10
Contents	Leaching: Definitions and industrial application of leaching, Elutriation and percolation, Preparation of Solid, Percolation tanks and agitated vessels, Principle of leaching process, Rate of leaching, Effect of temperature on leaching, Equilibrium in leaching		

Method of Assessment	Pen Paper test (internal)		
Learning Outcome 2	Students will be able to select suitable process for leaching..	8	10
Contents	Type of leaching process: stationary and moving bed leaching Advantage and disadvantages, Desirable characteristic of solvent, Concept of variable and constant underflow, construction and Operations of Leaching Equipments: Mixer settler, Dorr Agitator/classifier, Boll man extractor, Hildebrandt extractor Rotocel extractor		
Method of Assessment	Theory exam (external)		
Learning Outcome 3	Student will be able to Find the rate of leaching and operate leaching equipments.	9	10
Contents	Find the rate of leaching (Calcium carbonate, water, NaOH system) . Operation of different leaching equipments with understanding of their working principles.		
Method of Assessment	Laboratory test by observations(internal)		
Course Outcome 5	Student will be able to Extract more useful components from undesirable components in a binary mixture		
Learning Outcome 1	The students will be able Distinguish between leaching and extraction and Select suitable solvent for different extraction process	7	10
Contents	Extraction: Definition, Difference between leaching & extraction, Comparison with distillation as a separation operation, Fields of application of extraction, Desirable characteristics of solvent for extraction, Selectivity and distribution coefficient with respect to extraction, Representation of ternary system on triangular diagram		
Method of Assessment	Theory exam(external)		
Learning Outcome 2	The students will be able Operate different types of extractors used in chemical industries	9	20
Contents	Theory and Concept of extraction, Theoretical or ideal stage, Type of Extraction, Reactive Extraction, Extraction of bio molecules, Supercritical fluid extraction , Type of Extractor: Dispersion extractors, Pulse column, Centrifugal extractor, Podbielnik extractor, York Shiebel extractor,		
Method of Assessment	Pen Paper test (internal)		

Learning Outcome 3	Student will be able to operate extraction equipments.	9	10
Contents	understanding of operation of different extraction equipments		
Method of Assessment	Laboratory test by observations(internal)		

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		<i>C</i>	<i>0</i>	<i>2</i>				<i>1</i>	<i>1</i>	

COURSE NAME	SEPARATION PROCESSES II
CO Description	Student will be able to Monitor environment and working parameters of humidifying and de humidifying apparatus
LO Description	Student will be able to Identify the method of expressing relative saturation of air.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Humidification and Dehumidification: Definition and Terminology, Absolute Humidity, Molal Humidity, Relative and Percentage humidity, Definition and expression for them. Relation between Percentage and Relative humidity. Humid heat and Humid volume. Enthalpy for pure substances and Total enthalpy, VLE and Dew point, Adiabatic saturation temperature, Equation for adiabatic cooling lines, Wet bulb and Dry bulb temperature, Difference between adiabatic saturation temperature and wet bulb temperature. Theory of wet bulb temperature, Relation of wet bulb and dry bulb temperature with humidity and other thermal properties of air	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	9	2	Suggested text book handouts power point	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory Exam	Theory question related to the learned content will be asked in the exam	15	Question Paper	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	2				1	2	

COURSE NAME	SEPARATION PROCESSES II
CO Description	Student will be able to Monitor environment and working parameters of humidifying and de humidifying apparatus.
LO Description	Student will be able to operate humidifying and dehumidifying equipments and use humidity chart

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Psychometric chart and its application , Lewis relation, Measurement of Humidity, Psychometric and hygrometric method: Wet bulb Temperature and Dew point temperature psychometric method. Cooling Tower: Classification, Operations and working details, Applications, Industrial Humidifier: Operations and working details, Numerical problems based on humidity of air, Psychometric	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	8	2	Suggested text book handouts power point	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory Exam	Theory question related to the learned content will be asked in the test paper	15	Question Paper	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	2				1	3	

COURSE NAME	SEPARATION PROCESSES II
CO Description	Student will be able to Monitor environment and working parameters of humidifying and de humidifying apparatus
LO Description	Student will be able to determine properties of air and operate humidifying equipment

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	In Determination of different properties of air by dry bulb temperature method and de point method, operation of cooling tower and humidifier	Lab - demonstration	Faculty will explain the content in lab and demonstrate how to take reading		9	Experiment Setup Lab Manual	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	10	Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
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COURSE NAME	SEPARATION PROCESSES II
CO Description	Student will be able to Operate various types of drying equipments and control conditions required for optimum drying

LO Description	Student will be able to Identify different types of moisture and their role in drying
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SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Drying: Definitions , Bone dry solid, Moisture content (wet and dry basis), Free and Equilibrium moisture , Bound and Unbound Moisture, Equilibrium between drying air and moisture content of solids, Direct and Indirect Dryer, Batch and Continuous Dryer, Mechanism of air solid contacting in dryer: Cross circulation, through circulation, shower drying, fluidized bed drying and pneumatic conveying. Rate of drying, Constant drying conditions, Conditions of drying air affecting drying rate, Nature of material affecting drying rate: mechanism of moisture movement within a solid, Constant and falling rate period, critical moisture content, Calculation of total drying time for cross circulation drying. shrinkage and casehardening	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	11	3	Suggested text book handouts power point	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Theory exam	Theory question (including simple numerical problem) related to the learned content will be asked in the test paper	15	question paper	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					<i>C</i>	<i>0</i>	<i>2</i>				<i>2</i>	<i>2</i>	
COURSE NAME		SEPARATION PROCESSES II											
CO Description		Student will be able to Operate various types of drying equipments and control conditions required for optimum drying											
LO Description		The students will be able to understand and describe drying mechanism in different dryers.											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Application, Features, Construction, Working, Advantages and Disadvantages of following dryers: Tray dryer, Truck dryer Tunnel dryer, Rotary dryer, Drum dryer, Double drum dryer, cylinder dryer, fluidized bed dryer, and spray dryer	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	6	2	Suggested text book handouts power point							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
	Theory exam	Theory question (including simple numerical problem) related to the learned content will be asked in the test paper	10	question paper			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code			Course Code			CO Code	LO Code	Format No. 4
				C	0	2				2	3	
COURSE NAME		SEPARATION PROCESSES II										
CO Description		Student will be able to Operate various types of drying equipments and control conditions required for optimum drying										
LO Description		Students will be able to operate drying equipments										
SCHEME OF STUDY												
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	1 Plot drying rate curve for drying of in a tray dryer and fluidized bed dryer and rotary dryer and calculate drying time, Determine the Critical Moisture Content of a given material & find out its equation for constant and falling rate period	Lab - demonstration	Faculty will explain the content in lab and demonstrate how to take reading		6	Experiment Setup Lab Manual						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal					
	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	10	Rating scale			External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Nil												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				3	1	
COURSE NAME		SEPARATION PROCESSES –II											
CO Description		Student will be able to classify and compare different mechanism of crystallization and the equipments used in crystallization											
LO Description		Students will be able to understand mechanism of crystallization											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Crystallization: Introduction, Saturated and super saturated solutions, Crystallization from vapour, liquid melt and solution, Solubility Curve, Importance and objective of industrial crystallization, Theory of solubility and crystallization : Methods to achieve super saturation: Cooling a solution or melt, Evaporation, Adiabatic evaporative cooling, salting , precipitation, Crystal geometry, lattice arrangement, some common crystal shapes	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	7	2	Suggested text book handouts power point							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
	Theory exam	Theory question (including simple numerical problem) related to the learned content will be asked in the test paper	10	question paper			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				3	2	
COURSE NAME		SEPARATION PROCESSES II											
CO Description		Student will be able to classify and compare different mechanism of crystallization and the equipments used in crystallization											
LO Description		Student will be able to Select methods to achieve super saturations of solution											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Crystallization Process: Nucleation and Crystal Growth, Methods of nucleation: Classification, Spurious and Primary nucleation, Secondary nucleation types of primary and secondary nucleation, Mechanism of Crystal Growth : Miers theory and Delta L (ΔL) law, Effect of heat on size and growth of crystal, Particle Size Distribution of Crystals, Crystallizing Equipments: Agitated batch crystallizers, Swenson Walker crystallizers, Batch and Continuous vacuum crystallizers Caking of crystals and its prevention, Numerical problems	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	8	3	Suggested text book handouts powerpoint							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	20	Question paper			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				3	3	
COURSE NAME		SEPARATION PROCESSES - II											
CO Description		Student will be able to classify and compare different mechanism of crystallization and the equipments used in crystallization											
LO Description		Student will be able to Determine the crystal yield.											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Determination of crystallizer yield, and construction and operation of agitated batch crystallizer and Swenson Walker Crystallizer	Lab - demonstration	Faculty will explain the content in lab and demonstrate how to take reading		9	Experiment Setup Lab Manual							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	10	Rating scale			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				4	1	
COURSE NAME		SEPARATION PROCESSES II											
CO Description		Student will be able to separate efficiently different components of a mixture by using leaching methods											
LO Description		Identify the primary variables and parameters that determine the performance of leaching operations.											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Leaching: Definitions and industrial application of leaching, Elutriation and percolation, Preparation of Solid, Percolation tanks and agitated vessels, Principle of leaching process, Rate of leaching, Effect of temperature on leaching, Equilibrium in leaching	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	4	1	Suggested text book handouts power point							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
	Paper Pen Test	Theory question related to the learned content will be asked in the test paper	10	Test Paper + Rating Scale			Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				4	2	
COURSE NAME		SEPARATION PROCESSES II											
CO Description		Student will be able to separate efficiently different components of a mixture by using leaching methods											
LO Description		Students will be able to select suitable process for leaching..											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Type of leaching process: stationary and moving bed leaching Advantage and disadvantages, Desirable characteristic of solvent, Concept of variable and constant underflow, construction and Operations of Leaching Equipments: Mixer settler, Dorr Agitator/classifier, Boll man extractor, Hildebrandt extractor Rotocel extractor	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	6	2	Suggested text book handouts power point							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	2				4	3	

COURSE NAME	SEPARATION PROCESSES II
CO Description	Student will be able to separate efficiently different components of a mixture by using leaching methods
LO Description	Student will be able to Find the rate of leaching and operate leaching equipments.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	1 Find the rate of leaching (Calcium carbonate, water, NaOH system) . Operation of different leaching equipments with understanding of their working principles.	Lab - demonstration	Faculty will explain the content in lab and demonstrate how to take reading		9	Experiment Setup Lab Manual	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	10	Rating scale	internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
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COURSE NAME	SEPARATION PROCESSES II
CO Description	Student will be able to Extract more useful components from undesirable components in a binary mixture
LO Description	The students will be able Distinguish between leaching and extraction and Select suitable solvent for different extraction process

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Extraction: Definition, Difference between leaching & extraction, Comparison with distillation as a separation operation, Fields of application of extraction, Desirable characteristics of solvent for extraction, Selectivity and distribution coefficient with respect to extraction, Representation of ternary system on triangular diagram	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	5	2	Suggested text book handouts power point	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		<i>C</i>	<i>0</i>	<i>2</i>				<i>5</i>	<i>2</i>	

COURSE NAME	SEPARATION PROCESSES II
CO Description	Student will be able to Extract more useful components from undesirable components in a binary mixture
LO Description	The students will be able Operate different types of extractors used in chemical industries

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Theory and Concept of extraction, Theoretical or deal stage, types of Extraction, Reactive Extraction, Extraction of bio molecules, Supercritical fluid extraction , Type of Extractor: Dispersion extractors, Pulse column, Centrifugal extractor, Podbielnik extractor, York Shiebel extractor	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be taken.	7	2	Suggested text book handouts power point	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Pen Paper test	Theory questions related to the learned content will be asked in the test paper	20	Test paper+ rating scale	internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code			Course Code			CO Code	LO Code	Format No. 4
				C	0	2				5	3	
COURSE NAME	SEPARATION PROCESSES II											
CO Description	Student will be able to control operation of absorption in packed and plate towers.											
LO Description	Student will be able to operate extraction equipments.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	understanding and operation of different extraction equipments	Lab - demonstration	Faculty will explain the content in lab and demonstrate how to take reading		9	Experiment Setup Lab Manual						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal					
	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	10	Rating scale			Internal					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Nil												

SUBJECT – SEPARATION PROCESSES I
V SEMESTER CHEMICAL ENGINEERING
LIST OF EXPERIMENTS

Following list is tentative and that practicals will be taken for which facilities will be available

S.No.	Name of experiments
1.	Determination of properties of air by wet bulb temperature method.
2.	Determination of properties of air by dew point method.
3.	Operation of humidifier and observe changes in properties of air.
4.	Study of construction and working of cooling tower with demonstration of the process.
5.	To obtain rate of drying curve for given sample and to find critical and equilibrium moisture content.
6.	Demonstration of drying and to determine the drying efficiency of a tray dryer.
7.	demonstration of drying of granular solid in a tray dryer.
8.	To find yield for batch crystallization process.
9.	Study of construction and working of agitated batch crystallizer with demonstration of the process.
10.	Study of construction and working of Swenson Walker crystallizer with demonstration of the process.
11.	To demonstrate mass transfer in liquid –liquid extraction in a packed bed column.
12.	To demonstrate mass transfer in multistage countercurrent leaching system.
13.	To demonstrate mass transfer in Solid –liquid extraction in a Bonoto type extractor.
14.	To find distribution coefficient of acetic acid between water and toluene.
15.	To Find the rate of leaching (Calcium carbonate, water, NaOH system)