

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH 307**

SUBJECT NAME : **PROCESS EQUIPMENT DESIGN AND PLANT UTILITIES**

FACULTY NAME : **ARTI BHARGAVA**

DESIGNATION : **LECTURER (CHEMICAL)**

TOPIC	LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
Chemical equipments	1	aug.			
Process Instrument symbols Colour codes	2	aug.			
Distillation tower-	2	aug.sep.			
Plate type only (no. of plates,	3	sep			
Diameter,	3	sep			
- Height,	3	sep.-oct.			
Steam and Water requirements)	2	oct			
Heat exchanger (Double pipe heat exchanger	2	oct.			
Shell and tube type, no. of tubes,	3	oct.			
no. of passes	3	nov.			
Length of 1-1 and 1-2 pass	2	nov.			
Evaporator Single,	3	nov.			
double effect	3	dec.			
triple effect with forward and backward feeding.	3	dec			
Design of packed absorption column	3	jan.			
height and diameter calculation.	3	jan.			
Types of design Feasibility survey	1	feb.			
Factors for detailed estimate design Flow diagram	1	feb.			
Cost estimation	1	feb.			
Factors affecting profitability of investment	1	feb.			
Optimum design	2	feb.			
raw water storage and treatment	1	feb			
treatment of water, soft water and Dmwater	1	mar.			
Cooling water system	1	mar.			

Fire water system	1	mar.			
REVISION	9	mar.-apr			
TOTAL					
TOTAL	60				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : CH202

SUBJECT NAME : MASS TRANSFER

FACULTY NAME : ARTI BHARGWA

DESIGNATION : LECTURER (CHEMICAL)

TOPIC	LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
INTRODUCTION	1	AUG.			
Analogy between momentum ,heat and mass transfer	2	AUG.			
Ficks law of diffusion Diffusion of A through non-diffusing B	3	AUG.			
Equimolar counter diffusion Vapour liquid equilibrium	3	SEP.			
Partial pressure Dalton's law Henry's law Raoult's law	2	SEP			
Partial vaporization and partial condensation Relative volatility	2	SEP.			
Distillation Method of distillation	4	OCT.			
Differential distillation Flash distillation Continuos rectification	2	OCT.			
Reflux ratio and it's singnificance Optimum reflux ratio	2	OCT.			
Method of calculating number of plates by mc-cabe thiele method	2	NOV			
Equation of q line and it's importance	3	NOV.			
Distillation equipment Construction and utility Bubble cap column Sieve plate column Packed column	3	NOV.			
Batch distillation Azeotropic distillation Extractive distillation Steam distillation Meaning and importance of height equivalence to theoretical plate (HETP)	4	DEC.			
Humidification Saturated gas Relative humidity Percentage humidity Humid heat and humid volume Dew point and enthalpy Adiavatic saturation temp.	3	DEC.			
Wet bulb temp	1	JAN.			

Measurement of humidity from humidity chart Constructional details and working	2	JAN.			
Humidifiers & Dehumidifiers	1	JAN.			
Adsorptions	1	FEB.			
Types of adsorptions Equipment and methods	2	FEB.			
Revision	7	MAR.-APR.			
TOTAL	50				

TOTAL	60				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH209**

SUBJECT NAME : **GENERAL CHEMICAL TECHNOLOGY**

FACULTY NAME : **ARTI BHARGWA**

DESIGNATION : **LECTURER (CHEMICAL)**

TOPIC	LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
Sulfur Properties of sulfur	2	AUG			
Description classification of economical process and uses of sulfur Sulfuric acid	2	AUG			
Properties of sulfuric acid, production process and Description classification of economical process and uses of sulfuric acid	2	SEP.			
Fertilizers industries	2	SEP.			
Properties of ammonia Classification of manufacturing process of ammonia, description of economical process & uses of ammonia	2	SEP.			
Properties of nitric acid, manufacturing process and uses of nitric acid Properties of urea	2	OCT.			
Properties of ammonium nitrate Classification of manufacturing process and uses of ammonium nitrate	3	OCT.			
Properties of phosphoric acid Classification of manufacturing process and uses of phosphoric acid	2	NOV.			
Properties of calcium phosphate Classification of manufacturing process and uses of calcium phosphate	2	NOV.			
Properties of ammonium phosphate Classification of manufacturing process and uses of ammonium phosphate	3	DEC.			
Properties of soda ash Classification of manufacturing process and uses of soda ash	2	DEC.			
Properties of caustic & chlorine Classification of manufacturing process and uses of caustic & chlorine	3	JAN.			
Properties of soap Classification of manufacturing process and uses of soap Properties of detergent Classification of manufacturing process and uses of detergent	2	JAN.			

Introduction of carbohydrates and Fermentation industries	3	JAN.			
Properties of sucrose Classification of manufacturing process and uses of sucrose	1	FEB.			
Properties of starch Classification of manufacturing process and uses of starch	2	FEB.			
Properties of ethyl alcohol Classification of manufacturing process and uses of ethyl alcohol	1	FEB.			
Introduction of pulp & paper industries Properties of pulp Classification of manufacturing process and uses of pulp Properties of paper Classification of manufacturing process and uses of paper	1	MAR.			
Properties of cellulose Classification of manufacturing process and uses of cellulose	2	MAR.			
Properties of polyester, rayon Classification of manufacturing process and uses of polyester, rayon Properties of nylon-6 and nylon-66 Classification of manufacturing process and uses of nylon-6 and nylon-66	2	MAR.-			
Types of cement Classification of manufacturing process and uses of Portland cement Properties of lime Classification of manufacturing process and uses of lime	3	MAR.			
Natural products Vegetable oil Soyabean oil solvent extraction	2	APR			
Revision	4	APR			
TOTAL	50				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH302**

SUBJECT NAME : **OPERATION OF MASS TRANSFER**

FACULTY NAME : **ARTI BHARGAVA**

DESIGNATION : **LECTURER (CHEMICAL)**

TOPIC	LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
Fick's law, Diffusion of A through non-diffusing B	2	aug.			
Equimolecular counter diffusion	1	aug.			
Introduction, Importance, Chemical and physical absorption	3	aug.-sep.			
Mechanism of absorption-two film theory	1	sep.			
Diffusion of gases through a stagnant gas, Diffusion in the liquid phase, Rate of absorption, Relation between film and overall coefficient	4	sep.			
Factors influencing the transfer coefficient, Gas absorption equipments, Plate and packed column, Spray towers	4	oct			
Choice of solvent for absorption, Height of transfer unit (HTU), Number of transfer units (NTU), meaning and their relationship. (Simple numerical problems)	3	oct.			
Introduction and importance, Single stage extraction	2	oct.-nov.			
Agitated vessel and emulsion settlers, Use of triangular diagram, tie line, plait point, Determination of number of stages	3	nov.			
General principles of drying operations, Mechanism of drying	2	nov.			
Rate of drying, Constant rate period, Falling rate period, Second falling rate period	3	nov.-dec.			
Time for drying	1	dec.			
Constructional details and working of various types of dryers, Tray dryers	1	dec.			
Drum dryers, Rotary dryers, Spray dryers, fluid bed dryer, thin film dryer,	3	dec..			
Growth and properties of crystals, Super saturation, Crystallisation rate,	3	jan.			
Effect of impurities on crystal formation, Effect of temperature on solubility	3	jan.			
Batch crystalliser - Tank, Continuous crystallisation, Swenson walker, Oslo type,	4	feb.			
Principles of ion exchange,	2	feb.			

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH306**

SUBJECT NAME : **CEMENT AND FERTILIZER TECHNOLOGY**

FACULTY NAME : **ARTI BHARGAVA**

DESIGNATION : **LECTURER(CHEMICAL)**

TOPIC	LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
Importance of Fertilizers in Agriculture, Soil - Fertilizer Interaction	2	AUG.			
HPK requirement of various crops, Classification of Fertilizers	2	AUG.			
Feed stocks for synthesis gas productions	3	SEP.			
Manufacturing processes for production of Urea, Ammonium nitrate and Ammonium sulfate.	3	SEP.			
Raw material and manufacturing processes of, Phosphoric acid, Diammonium phosphate	2	SEP.			
Single super phosphate, Triple super phosphate	2	OCT.			
Raw materials and manufacturing process of Potassium nitrate	3	OCT.			
Potassium sulfate, Potassium chloride	3	OCT.			
Raw materials and manufacturing process for mixed N.P.K. fertilizers	2	NOV.			
Definition, Constituent of cement	3	NOV.			
Types and grades of cement, Reactions of production of cement	3	NOV.			
Setting of cement, Flux ingredients and their functions	3	DEC.			
Types of processes - their relative merits and demerits	3	DEC.			
Flow diagrams	3	JAN.			
Raw material requirement, Quality control	3	JAN.			
Temperature variation in kiln	2	FEB.			
Heat recovery auxiliaries resistance time	2	FEB.			
Chemical reactions	2	FEB.			
Clinker formation	1	MAR.			
Kiln heat balance	1	MAR.			
energy consumption	1	MAR.			
revision	11	mar.-apr.			

TOTAL	60				