GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH305** SUBJECT NAME : **INDUSTRIAL SAFETY AND ENVIROMENT ENGINEERING**

FACULTY NAME : **RAKESH SHARMA** DESIGNATION : **LECTURE(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
Environment,Pollution	2	AUG.			
Ecology,Pollution and its effect on Ecological balance	2	AUG.			
Classification of pollution (Land, Water, Air, Noise, Radioactive)	2	SEP.			
Character and origin of various process industries waste like fertilizer, Cement, Chlor-Alkali, paper, leather, Glass, Petroleum refinery etc.	2	SEP.			
Types of air pollution their sources and their harmful effect., Green house effect	2	SEP.			
Air pollution control equipment,Settling chambers,Cyclones	2	SEP.			
Scrubbers (dry and wet),Multiclones	2	OCT.			
Electro Static Precipitation (ESP),Bag filters	2	OCT.			
Control of oxides and nitrogen and sulfur gases,Ambient air quality measurement,Sampling and their standards	2	OCT.			
Water pollution, Standards for drinking water	2	OCT.			
Waste water (domestic and industrial), Methods of measurement of various parameter like BOD, SS, pH, COD, TDS etc.	2	NOV.			
Methods of treatment of industrial waste water,Chemical treatmentPhysico chemical treatment	2	NOV.			
Bio-chemical treatment,Any other advance treatment	2	NOV.			
General,(noise pollution) The concept of sound	2	NOV.			
Measurement of sound, Acoustic Environment	2	DEC.			
Effects of noise, Noise control	2	DEC.			
introduction,(radio active pollution) Sources of nuclear waste	2	DEC.			
Types of nuclear waste, Effect of Radiation	3	JAN.			
Abatement procedures and controlling measures	3	JAN.			

solid waste characterization and classification,,reductions	2	FEB.			
reuse and recycling, physical and chemical treatment methods	3	FEB.			
General safety rules and regulation, Safety during manufacturing processes like welding, grinding, handling of chemicals etc.	3	FEB.			
Fire extinguishers	2	MAR.			
Safety symbols and colours codes, Safety of electrical installation and general electrical safety practices.	3	MAR.			
REVISION	7	MAR.-APR.			
TOTAL	60				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH204**   SUBJECT NAME : **TRASNPORT PHENOMENA**

FACULTY NAME   : **RAKESH SHARMA**   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,DEFINATION OF TRANSPORT PHENOMENA	1	AUG.			
ANALOGY BETWEEN MASS,HEAT & MOMENTUM TRANSFER, DEFINATION OF VISCOSITY,DIFFUSIVITY & CONDUCTIVITY	3	AUG.			
COMPARISION OF MASS TRANSFER RATES IN EQUMOLECULAR COUNTER DIFFUSION & DIFFUSION THROUGH A STATIONARY GAS DIFFUSION MAXWELL	3	AUG.			
UNIDIMENSIONAL VELOCITY TEMPRATURE &CONCENTRATION PROFILE	2	SEP.			
DIFFUSION IN GAS PHASE,EQUIMOLECULAR COUNTER DIFFUSION, DIFFUSION THROUGH A STATIONARY GAS	2	SEP.			
COMPARISION OF MASS TRANSFER RATES IN EQUMOLECULAR COUNTER DIFFUSION & DIFFUSION THROUGH A STATIONARY GAS DIFFUSION ,MAXWELL LAW OF DIFFUSION, DIFFUSIVITIES OF VARIOUS VAPOURS	3	SEP.			
DIFFUSION IN LIQUID PHASE ,MASS TRANSFER BY CONVECTION, MASS TRANSFER IN TURBULENT FLUID, MASS TRANSFER IN BULK FLOW	2	OCT.			
MASS TRANSFER ACROSS A PHASE BOUNDRY,TWO FILM & PENETRATION THEORY,MASS TRANSFER COEFFICIENT	3	OCT.			
HEAT TRANSFER BY CONDUCTION,STEADY STATE HEAT TRANSFER THROUGH- SINGLE FLAT WALL,COMPOSITE WALL,THICK WALL TUBE & SPHERICAL SHELL,UNSTEADY STATE TRANSFER OF HEAT	6	NOV.			
DETERMINATION OF FILM COEFFICIENT FORCED CONVECTION INSIDE & OUTSIDE TUBE, NATURAL CONVECTION,	6	NOV-DEC.			

LAW OF VISCOSITY ,EQUATION OF CONTINUITY,NEWTONIAN & NON NEWTONIAN FLUID	4	DEC.-JAN.			
BOUNDRY LAYER & PIPE FLOW, THE MOMENTUM EQUATION	2	JAN.			
TRANSPORT PHENOMENA, REYNOLD ANALOGY,CHILTON COLBURN ANALOGY	5	FEB.			
REVISION	8	MAR.			

TOTAL	50				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE   :   CH205   SUBJECT NAME : ORGANIC CHAMISTRY

FACULTY NAME   :   RAKESH SHARMA   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
Tetra valency of carbon, Bonding system,Structural formulae.	2	AUG.			
classification organic compounds, nomenclature	3	AUG			
Definations and concepts	2	SEP			
Homologous series, Functional groups, Isomerism – Structural and Stereo in brief	3	SEP			
Introduction of Polymerisation : Definitions and concepts, Polymerisation reactions	3	SEP.			
Polymer structure, functionality and degradation,Characterisation of polymers	3	OCT			
Different types of polymers - natural and modified natural products,Synthetic polymers,	2	OCT.			
Addition and condensation products	3	NOV.			
Mass, solution, emulsion & SUsspenssion polymerization method, & uses	2	NOV.			

Origin of colour, Theories of colour and dyes	3	JAN.			
Classification of dyes, Chemical constitution	2	JAN.			
Alkaloids : General properties and uses	3	Feb.			
Terpenes : Definition Classification, General properties and uses.	3	Feb.			
Colloids : Crystalloids and colloids Classification Preparation	3	Mar.			
Lyophillic and Lyophobic, Cataphoresis, Electrophoresiss	3	Mar.			
Peptization Applications	2	Mar.			
REVISION	8	Mar.-apr			

TOTAL	50				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH205PRACTICAL**   SUBJECT NAME : **ORGANIC CHEMISTRY**

FACULTY NAME   : **RAKESH SHARMA**   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
Carboxyl Hydroxyl	4				
Phenol Alcohol	4				
Carbohydrates Carbonyl	4				
Aldehydes and Ketones Nitro	4				
Amine,Citric Acid	4				
Tartaric Acid Benzoic Acid	4				
Oxalic Acid Acetic Acid	4				
Phenol P-naphthol	4				
Methyl Alcohol Ethyl Alcohol	4				
Acetone Naphthalene	4				
Benzene Toluene	4				
Urea Chloroform	4				
REVISION	10				
TOTAL	58				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH206**   SUBJECT NAME : **CHEMICAL REACTION ENGINEERING**

FACULTY NAME : **RAKESH SHARMA**   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
Rate of reaction, Variables affecting rate of reaction	1	AUG.			
Molecularity and order of reaction, Rate constant	1	AUG.			
Types of Reaction : Single - multiple reactions Reversible - Irreversible reactions	2	SEP			
Temperature dependency according to Arhenious theory, collision theory and transition state theory, Simple numerical problems	1	SEP.			
Constant Volume Batch Reactor : Integral method of analysis of data Differential method of analysis of data	2	OCT.			
Rate expressions for zero, first, second and third order reactions. Simple numerical problems	6	OCT.			
Reactor Design : Design equation for batch reactor Semi batch reactor	4	NOV.			
Continuous reactor (C.S.T.R.) Plug flow reactor	5	NOV.			
Space time Holding time Space velocity Simple numerical problems	4	DEC.			
Comparison of Reactors :Size Comparison For Single Reactors Batch Reactor With Plug Flow Reactor	5	JAN.			

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

Comparison Of Mixed Flow And Plug Flow Reactor Comparison Of CSTR With Plug Flow Reactor For First Order Reactions	4	FEB.		
Basic concepts of non ideal flow Deviation From Ideal Flow Residence Time Distribution (RTD) Function	4	FEB.		
Pulse Input C Curve E Curve F Curve	4	MAR.		
REVISION	7	MAR.-APR		

TOTAL	50	

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH207**   SUBJECT NAME : **HYDRAULICS**

FACULTY NAME   : **RAKESH SHARMA**   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
Hydrostatics : Pressure at a point in a liquid at rest Pressure, unit of pressure, type of pressures	2	AUG.			
Pascal's law Transmission of fluid pressure Simple applications like Bramah press	2	AUG.			
Manometers : Piezometer tube Simple U-tube manometer	4	SEP.			
Inverted U-tube manometers Inclined manometers Micro manometers	2	SEP.			
Flow of Fluids : Types of flow Reynolds number	2	OCT.			
Bernoulli's theorem Applications of Bernoulli's theorem in measuring flow rate by orificemeter, venturimeter, Pitot tube Rotameters	4	OCT.			
Viscosity : Concept and importance of viscosity Types of viscosity and their units	2	OCT.			
Newton's law of viscosity Newtonian and non-Newtonian fluids	3	NOV.			
Flow through Pipes : Haugen-Poiseuille equation Loss of head due to friction	2	NOV.			
Darcy's formula Head loss in pipe fittings Water hammer	3	NOV.			

Transmission of Fluids : Transportation of fluids	2	DEC.			
Pipes and tubes Different types of valves like gate valve, glow valve, ball valve, cock valve, butterfly valve, needle valve	4	JAN.			
Different types of pumps like centrifugal, reciprocating, gear pumps, vacuum pumps jet ejector. Cavitation, Priming, NPSH, Suction lift.	4	FEB.			
Characteristics curves for centrifugal pumps Calculation of head and power of centrifugal pumps	4	FEB.			
REVISION	10	MAR.-APR.			

TOTAL	50				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE   :   CH207   SUBJECT NAME : HYDRAULICS

FACULTY NAME   :   RAKESH SHARMA   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
Study Of constructional features and working of different type of manmeters and pressure gauges	6	aug.-sep.			
verification of bernoulli's theorem	4	sep.			
measurement of flow by orifice and venturimeter	6	sep.-oct.			
study of pitot tube and rotameters	4	0ct.			
to determine friction loss in flow through pipes	4	nov.			
to study constructional features of centrifugal pumps	4	nov.-dec.			
to study constructional features of reciprocating pumps	6	dec.-jan.			
to study constructional features of gear pumps	4	jan.-feb.			
to study reynold's apparatus to determine leminar, transition and turbulent flow	6	feb.			
to study variation in head and capacity of centrifugal pumps	4	feb.-mar.			
revision	12	mar.-apr.			

SUBJECT CODE   :   CH207   SUBJECT NAME : HYDRAULICS

FACULTY NAME   :   RAKESH SHARMA   DESIGNATION : LECTURER(CHEMICAL)

TOTAL	60				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH208**   SUBJECT NAME : **MECHANICAL OPERATIONS**

FACULTY NAME : **RAKESH SHARMA**   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
Particle Technology : Characteristics of solid particles Determination of specific surface and size of particles and number of particles in the mixture	2	AUG.			
Properties of particulate masses Mohr stress circle Janssen equation Mixing of solids, mixing of Cohesive and non cohesive solids	2	AUG.			
Comminution : Basic principles Determination of power in communition	2	SEP.			
Factors affecting comminution Industrial communition equipments like jaw crushers, Gyratory crushers, double roll crushers, ball mill and fluid energy mill Simple numerical problems	4	SEP.			
Screening : Screening, mesh number, standard screens, Differential and cumulative analysis,	3	OCT.			
Screen capacity and effectiveness. Screening equipments	5	OCT.			
Filtration : Filter medium, Batch and continuous filtration	5	NOV.			
Gravity and centrifugal filters. Filtration equipments like sand filter, Rotary drum filter, bag filters, plate and frame filter press,	3	DEC.			
Gas Cleaning : Cyclones Electrostatic precipitators, Sonic agglomeration	6	DEC.			

Storage and Transportation of Solids : Storage of solids Angle of repose	5	JAN.			
Conveyors like belt conveyor, screw conveyor, bucket elevators, pneumatic conveyors, apron conveyors, and hydraulic transport	5	FEB.			
	8	MAR.-APR.			

REVISION					
TOTAL	50				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)
SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : CH207   SUBJECT NAME : HYDRAULICS

FACULTY NAME   : RAKESH SHARMA   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
to perform the sieve analysis of a given sample	6	aug.-sep.			
to study rittinger's law of comminution	6	sep.			
to study kick's law of comminution	6	oct.			
to study bond's law of commination	6	0ct.-nov.			
to study the rate of filteration with the help of filter press	6	nov.-dec.			
to study screen effectiveness	6	dec.-jan.			
to study the rate of conveying of material and motor power required for pneumatic conveyors	6	jan.-feb.			
to study the power of drive motor for given load/capacity for bucket elevator	6	feb.-mar.			
revision	12	mar.-apr.			

FACULTY NAME   : RAKESH SHARMA   DESIGNATION : LECTURER(CHEMICAL)

TOTAL	60				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH304** SUBJECT NAME : **PETROLIUM TECHNOLOGY**

FACULTY NAME : **RAKESH SHARMA** 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
Origin of Petroleum, Carbide theory, Modern theory	2	AUG.			
Composition of petroleum, Classification of petroleum	2	AUG.			
Detection of petroleum deposit, Production of petroleum	2	SEP.			
Crude oil exploration/ vacuum distillation process	1	SEP.			
Thermal cracking	1	SEP.			
Catalytic cracking (Fixed bed, Fluidised bed)	1	SEP.			
Hydro cracking	2	SEP..			
Coking process	2	OCT.			
Thermal reforming, Catalytic reforming	3	OCT.			
Thermal Polymerisation, Catalytic Polymerisation	2	OCT..			
H2SO4 alkylation process, HF alkylation process	4	OCT.-NOV.			
SO2 treatment of kerosene, Doctor's processes	2	NOV.			
Clay contacting, H2SO4 treatment	3	NOV.			
Udex process	2	DEC.			
Production of ethylene	2	DEC.			
Manufacture of polyethylene,High pressure polyethylene, Medium pressure, Low pressure,	4	DEC.-jan.			
Manufacture of phthalic anhydride Manufacture of cyclohexane	4	jan.			
Production of caprolactum for nylon-6, Petrol - quality,Octane number, Knocking.,	3	feb.			
Cetane number	1	feb.			
Specific gravity	1	feb.			
Viscosity	1	feb.			
Flash & fire point	2	mar.			
Cloud point, pour point, and freezing point	2	mar.			

Smoke point	1	mar.			
revision	10	mar.-apr.			
TOTAL	60				