GOVERNMENT POLYTECHNIC COLLEGE, KC

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH309** SUBJECT NAME : **PROCESS TESTING AND**

FACULTY NAME : **RADHE SHYAM BAIRWA** DESIGNATION : **LECTUR**

S.NO.	TOPIC	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
1	To dertemine the refractive index of given sample by Abbe refractometer	2	AUG		
2	To determine the angle of polarisation of a given sample by polarimeter and calculation of specific rotation	4	AUG - SEP		
3	To determine the pH value of water by pH meter	4	SEP		
4	To determine the calorific value of gas fuel by junker's gas calorimeter, To determine the flash point of given sample by abbel's apparatus	2	SEP		
5	To determine the flash point and fire point of given sample by P. Martens appartaus	4	OCT		
6	To determine the viscosity of given sample by red wood viscometer no. 1 and no. 2	2	OCT		
7	to determine the softening point of given sample by softening point apparatus	4	OCT - NOV		
8	to measure the temperature of radiating hot source by optical pyrometer	2	NOV		
9	to measure the turbidity of water by jackson turbidity meter	4	NOV		
10	To measure the turbidity of water by digital electronic	2	DEC		
11	To determine the moisture content of a given sample by universal moisture meter	4	DEC		

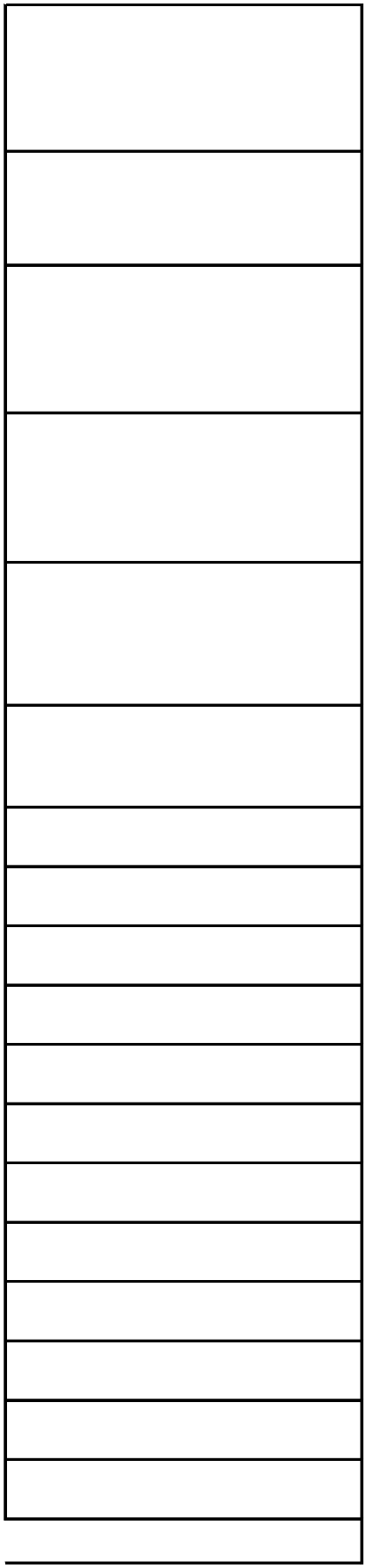
12	To measure moisture content of a given sample by infrared moisture balance	2	JAN		
13	to determine the penetration in a given sample by penetrometer	4	JAN		
14	To determine the calorific value of a given solid sample by bomb calorimeter	2	FEB		
15	To determine the pH of a given water sample with the help of digital eletronic pH meter	4	FEB		
16	To measure dissolved oxygen in given water sample with the help of water testing field kit	2	MAR		
17	To determine BOD and COD in a given sample of water	2	MAR		
18	Revision	10	MAR - APR		
	TOTAL	60			

)TA (RAJ.)

MATERIAL SCIENCE

ER (CHEMICAL)

E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC



GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH201** SUBJECT NAME : **CONCEPT OF HEAT TRANSFER**

FACULTY NAME : **RADHE SHYAM BAIRWA** 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 flow of heat and electricity Modes of heat transfer	3	AUG.			
Conduction The thermal conductivity	1	AUG.			
Fourier's law of heat conduction Unsteady state equation Steady state equation	3	SEP			
Heat flow equation for composite walls Composite cylinders	2	SEP			
Spheres Optimum insulation thickness	4	SEP.			
Dimensional analysis Criteria of similitude	1	OCT.			
Buckingham pie theorem	4	OCT.			
Advantages & limitations of dimensional analysis Dimensionless numbers for heat transfer & their physical significance	2	NOV.			
True temperature difference Log mean temperature difference	2	NOV.			
Diffference between normal temperature diff. and log mean temp. diff	1	NOV.			
Convection Natural & forced convection	1	DEC.			
Energy transfer mechanism through the boundary layer Thermal and hydrodynamic boundary layer	3	DEC.			

Double pipe heat exchanger Constructional details and working	2	JAN.			
Overall and surface heat transfer coefficient Process instrumentation drawing	3	JAN.			
Shell and tube heat exchanger Constructional details and working	6	FEB.			
Temperature profile of 1-1 cocurrent and counter current 1-2 parallel and counter flow exchanger Process instrumentation drawing	3	FEB.			
Plate type heat exchanger Constructional details and working Uses and application	3	MAR			
Revision	5	MAR.-APR			
TOTAL	50				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : CH203 SUBJECT NAME : CHEMICAL PROCESS CALCULATION

FACULTY NAME : RADHE SHYAM BAIRWA 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 DIMENSION & UNITS, TABLE	2	AUG.2015			
CONVERSION FACTOR,CHEMICAL FORMULA,	2	AUG.			
CHEMICAL ANALYSIS	1	AUG.			
CHEMICAL PROCESS INDUSTRIES	1	AUG.			
UNIT PROCESS AND UNIT OPERATION	2	AUG.			
SIMPLE NUMERICAL PROBLEM	2	SEP.			
STOICHIOMETRIC RELATION, METHOD OF EXPRESSING	1	SEP.			
COMPOSITION,IDLE GAS LAW,& APPLICATION	1	SEP.			
PARTIAL PRESSURE & VAPOUR PRESSURE,SIMPLE NUMERICAL PROBLEM,	2	SEP.			
KEY COMPONENT BASIS, TOTAL & COMPONENT BALANCE	2	OCT.			
STEADY STATE & UN STEADY STATE,	1	OCT.			
BY PASS, & RECYCLE SIMPLE NUMERICAL PROBLEM	3	OCT.			
INTRODUCTION MATERIAL BALANCE WITHOUT CHEMICAL REACTION,	1	NOV.			

PREPRATION OF MATERIAL BALANCE	1	NOV.			
ELECTROCHEMICAL REACTION,BY PASS & RECYCLE	3	NOV.			
FIRST LAW;OF THERMODYNAMICS, TYPES OF HEAT EFFECT,HEAT CAPACITY	3	DEC.			
SPECIFIC HEAT,THERMOCHEMISTRY OF SOLUTION,HEAT OF WETTING,HEAT OF ABSORPTON	2	DEC.			
HEAT OF REACTION, ADIABATIC FLAME TEMP. CALCULATIONS	4	JAN.			
UNIT OPERATIONS, APPLICATION OF STIOCHIOMETRIC CALCULATION TO HUMIDIFICATION,	2	JAN.			
EVOPRATION, DISTILLATION,CRYSTALIZATION,& DRYING,SIMPLE NUMERICAL PROBLEM	4	JAN.			
UNIT PROCESS ,COMBUSTION,OXIDATION	1	FEB.			
SULFUR COMPOUNDS, SIMPLE NUMERICAL PROBLEM	3	FEB.			
REVISION	6	FEB.-MAR			
TOTAL	50				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **Ch201** SUBJECT NAME : **concept of heat transfer**

FACULTY NAME : **radhe shyam bairwa** 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 STUDY THE HEAT TRANSFER BETWEEN HOT AND COLD FLUIDS IN A DOUBLE PIPE HEAT EXCHANGER	6	AUG.- SEP.			
TO DETERMINE INDUVIDUAL AND OVERALL HEAT TRANSFERCOEFFICIENT OF A DOUBLE PIPE HEAT EXCHANGER	4	SEP.			
TO STUDY HEAT TRANSFER THROUGH LAGGED PIPE	4	SEP.-OCT.			
TO STUDY HEAT TRANSFER THROUGH COMPOSITE WALL	6	OCT.-NOV.			
TO STUDY HEAT TRANSFER THROUGH COMPOSITE SPHERE 1	6	NOV.			
TO STUDY HEAT TRANSFER THROUGH FORCED CONVECTION APPARATUS	4	DEC.			
TO STUDY SHELL AND TUBE HEAT EXCHANGER	6	JAN.			
TO VERIFY THE TEMPERATURE PROFILE OF 1-1 CO-CURRENT AND COUNTER CURRENT HEAT EXCHANGER	6	FEB.			
TO STUDY PLATE TYPE HEAT EXCHANGER	6	FEB.-MAR.			
REVISION	12	MAR.-APR.			

TOTAL	60				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH301** SUBJECT NAME : **OPERATION OF HEAT TRASFER**

FACULTY NAME : **RADHE SHYAM BAIRWA** 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
Absorption, Reflection and Transmission,Radiant energy distribution	2	aug.	.		
Emissive power, Black body & White body	2	aug.	.		
Grey body, Kirchoff's law	2	sept.			
Planck's law, Stefan-Boltzmann law	2	sept.			
Wein's displacement law, Radiosity	2	sep.			
Types, Uses	2	sep.			
Fin efficiency,Calculation for extended surface exchangers	2	oct.			
Drop wise and film type condensation,Coefficient for film type condensation on vertical and horizontal surfaces	2	oct.			
Condensation of superheated vapours, Effect of non-condensable gases on rate of condensation	2	oct..			
Simple numerical problems	2	oct..			
Classification, Constructional details and working of Shell and tube condenser, Contact condenser	3	nov.			
Spray condenses, Jet condenser, Barometric condenser,	5	nov.			
Single and multiple effect evaporation, capacity and economy, Boiling point elevation,	3	dec.			
Constructional details and working of, Agitated film evaporators	2	dec.			
Long tube evaporators, Short tube evaporators,Forced circulation evaporators,	3	dec.-jan.			
Upward flow evaporators, Downward flow evaporators	2	jan.			
Enthalpy balance for single and multiple effect evaporators.	2	jan.			
Feeding arrangements in multiple effect evaporators,Evaporator accessories	5	feb.			
The boiling phenomena, Hysteresis in the boiling curve	2	feb.			
Nucleate boiling, Homogeneous nucleation, Heterogeneous nucleation.	2	feb.-mar.			
Forced convection boiling in a vertical tube	2	mar.			

revision	9	mar.apr.			
TOTAL	60				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH301** SUBJECT NAME : **OPERATIONS OF HEAT T**

FACULTY NAME : **RADHE SHYAM BAIRWA** DESIGNATION : **LECTUR**

S.NO.	TOPIC	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
1	To Study heat transfer through pin-fin apparatus	6	AUG - SEP		
2	To study stefan - boltzmann law	6	SEP		
3	To study emissivity experiment	6	OCT		
4	To study single effect evaporation	6	OCT - NOV		
5	To study double effect evaporation	6	NOV		
6	To study triple effect evaporation	6	DEC - JAN		
7	To study open pan evaporator	6	JAN- FEB		
8	To study condensation in vertical condenser	6	MAR		
9	REVISION	8	MAR - APR		

	TOTAL	56			

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ER (CHEMICAL)

E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH303** SUBJECT NAME : **CHEMICAL ENGGINEERING THERMODYNAMICS**

FACULTY NAME : **RADHE SHYAM BAIRWA** 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
Definition, Scope and limitations of thermodynamics	2	aug.			
Thermodynamic functions and properties, Thermodynamic system and equilibrium, Zeroth law of thermodynamics	3	aug.-sep.			
Statement of First Law, First law for steady - state flow process	3	sep.			
Internal energy, enthalpy and entropy of system, Specific heat at constant pressure and volume,	2	SEP.			
Equations for E, S and H in terms of P,V and T,Reversible processes	2	SEP.			
Definition of work and heat,Simple numerical problems	4	OCT.			
Ideal gas equation	2	OCT.			
Isothermal, Isometric, Isobaric, Adiabatic and polytropic processes	2	OCT.			
Calculation of work, heat and change in Internal energy for these processes.	4	NOV.			
Equation of state for gases, Compression factor	2	NOV.			
Calculation of molar volume of mixture of gases by following methods,Ideal gas equation,Dalton's law,Amagat's law,Pseudocirtical method,Vander waal's equation	4	NOV.-DEC.			
Effect of temperature on heat capacities of liquid and gases,Standard heat of Reaction,Standard heat of formations,	3	DEC.			
Standard heat of combustion	2	DEC.-JAN.			
Simple numerical problems	3	JAN.			
Hess law	1	JAN.			
Statement, The heat Engine and heat Pump	2	FEB.			
Carnot cycle	2	jFEB.			
Concept of increase of Entropy, Relationship among thermodynamic properties for single phase and two-phase regions	2	FEB.			
Statement	2	feb.			
Applications	2	mar.			

Purpose of new function, Properties of Helmholtz free energy	2	mar.			
Properties of gibbs free energy	2	mar.			
Temperature dependency of free energy	1	mar.			
revision	6	mar.-apr.			
TOTAL	60				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **CH 309** SUBJECT NAME : **PROCESS TESTING AND MATERIAL SCIENCE**

FACULTY NAME : **RADHE SHYAM BAIRWA** 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
Refractive Index Angle of polarisation	2	aug.			
pH value Calorific value	2	aug.			
Flash point Fire point	2	sep.			
Viscosity Softening point	2	sep			
Turbidity Equilibrium moisture	2	sep.			
Bound and free moisture Cloud and pour point	2	sep.			
Saponification number Volatility	2	oct			
Refractrometer Polarimeter	2	oct			
pH meter Abel's apparatus	2	oct			
P.Martins apparatus Softening point apparatus	2	oct			
Penetrometer Turbidity meter	2	nov.			
Bomb calorimeter Redwood viscometer	2	nov.			
Orsat apparatus Pour point apparatus	2	nov.			
Proximate and ultimate analysis of coal Composition of gaseous fuels	2	nov.			
Source of water Impurities of water	2	dec.			
Hardness of water Disadvantages of hard water in various fields	2	dec.			
Scale and sludge formation in boilers and their prevention Zeolite process	2	dec.			
BOD - its definitions and its significance COD - its definitions and its significance	2	jan.			
Material classification Engineering requirements of materials	2	jan.			
Selection of materials for engineering design	2	jan.			
Mechanical properties Thermal properties	2	feb.			
Chemical properties Physical properties	2	feb.			
Definition Classification of heat treatment processes	2	feb.			

Purpose of heat treatment Principles of heat treatment	2	mar.			
introductions factors affecting corrosion types	2	mar.			
REVISION	10	mar-apr.			
TOTAL	60				