

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2	3	0	4	1	1	
COURSE NAME		CHEMICAL PROCESS UTILITIES AND MAINTENANCE											
CO Description		Identify the composition, characteristics and combustion process of fuels.											
LO Description		To Identify the composition and characteristics of solid fuel.											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Introduction to coal and wood charcoal, origin of coal and theories, classification of coal by rank and characteristics, significance of the constituent of coal, moisture, volatile matter, ash content and fixed carbon, ultimate and proximate analysis of coal.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial Lab assignments, presentation, lab demonstration, hands on practice	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge. Teacher will conduct lab assignments to make students practice their knowledge. Teacher will demonstrate the procedure of lab experiments.	5	4	Handouts, chalk board, PPT, text book.lab							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External /Internal						
1	Pen Paper test/Theory Exam/practical Exam	Student will be asked to explain different types of coal and test their characteristics	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals			External THEORY						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	C	0	2	3	0	4	1	2	Format No. 4
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTENANCE									

CO Description	Identify the composition, characteristics and combustion process of fuels.
LO Description	to use solid fuels efficiently

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	calorific value and its determination, storage of coal – oxidation and spontaneous combustion, pulverization of coal – advantages and disadvantages, introduction to coke, high temperature and low temperature carbonization.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial Lab assignments, presentation, lab demonstration, hands on practice	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge. Teacher will conduct lab assignments to make students practice their knowledge. Teacher will demonstrate the procedure of lab experiments	6	3	Handouts, chalk board, PPT, text book.lab	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Pen Paper test/Theory Exam/practical Exam	Student will be asked to explain the technique for efficient utilization of solid fuels and determine their characteristics	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals	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.
				C	0	2	3	0	4	1	3	4
COURSE NAME		CHEMICAL PROCESS UTILITIES AND MAINTENANCE										
CO Description		Identify the composition, characteristics and combustion process of fuels.										
LO Description		To explain characteristics of liquid & gaseous fuel										
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	Characteristics of liquid and gaseous fuel and comparison with solid fuel. Some common liquid and gaseous fuels Name and Composition.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial Lab assignments, presentation, lab demonstration, hands on practice.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge. Teacher will conduct lab assignments to make students practice their knowledge. Teacher will demonstrate the procedure of lab experiments.	05	02	Handouts, chalk board, charts, , lab.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required				External / Internal				
1	Pen Paper test/Theory Exam/practical Exam	Student will be asked to characterize liquid and gaseous fuel and determine their characteristics	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals				Internal				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Nil												

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					<i>C</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>2</i>	<i>1</i>	
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTENANCE												
CO Description	To Identify the principles involved in the formation of compressed air, steam and other utilities.												
LO Description	to produce compressed air and steam for chemical plant												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1	Compressed air and its uses in chemical industries, steam, formation of steam, wet and dry steam, dryness fraction of steam, superheated steam, uses of steam .	Interactive classroom teaching, demonstration, quiz, assignments, tutorial. lab demonstration	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	06	02	Handouts, chalk board, PPT, text book,							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Pen Paper test/Theory Exam	Student will be asked to describe industrial air and steam	10	(Test paper + Rating scale) and (Question paper +Rating scale)			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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					C	0	2	3	0	4	2	2	
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTANCE												
CO Description	To Identify the principles involved in the formation of compressed air, steam and other utilities.												
LO Description	to operate steam boiler												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Boilers, classification of boilers, various mountings and accessories of a typical boiler, name of some commonly used boilers	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	05	02	Handouts, chalk board, PPT, text book,							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Pen Paper test/Theory Exam	Student will be asked to describe boiler mountings and accessories	10	(Test paper + Rating scale) and (Question paper +Rating scale)	Internal								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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				<i>C</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>3</i>	<i>1</i>	
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTANCE											
CO Description	To economize and select best among the available alternatives of energy											
LO Description	To locate sources of heat losses and their remedies.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required		Remark				
1	. Sources of heat losses from furnaces and other equipment methods to recover the waste heat from chemical plants brief ideal of waste heat boilers and regenerators.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial. lab demonstration	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge. Teacher will conduct lab assignments to make students practice their knowledge	08	4	Handouts, chalk board, charts, , lab.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required				External / Internal				
1	Pen Paper test/Theory Exam/practical Exam	Student will be asked to describe sources of heat losses in chemical plants and methods to recover them	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals				External				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Nil												

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					C	0	2	3	0	4	3	2	
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTNEANCE												
CO Description	To economize and select best among the available alternatives of energy.												
LO Description	to understand importance of renewable energy sources.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1	introduction to and brief idea about characteristics ,merits and demerits of bio gas,solar energy, wind energy,tidal energy and geothermal energy.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	09	04	Handouts, chalk board, PPT, text book, charts.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Pen Paper test/Theory Exam	Student will be asked to explain bleaching powder and its uses.	10	(Test paper + Rating scale) and (Question paper +Rating scale)			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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					<i>C</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>4</i>	<i>1</i>	
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTANCE												
CO Description	To select appropriate maintenance technique and coordinate in organization of chemical plant.												
LO Description	To coordinate with maintenance department.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1	Concept of maintenance, objectives and importance of maintenance, types of maintenance : their significance, merits and demerits. Organization structure of maintenance department, control and coordination of various related functions, job order	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	07	03	Handouts, chalk board, PPT, text book, chart.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Theory exam/Practical Exam	Student will be asked describe different type of maintenance.	10	(Test paper + Rating scale) and (Question paper +Rating scale)			Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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				<i>C</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>4</i>	<i>2</i>	
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTNEANCE											
CO Description	To select appropriate maintenance technique and coordinate in organization of chemical plant.											
LO Description	To describe the general procedure for fault finding and trouble shooting.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	Meaning of fault finding and trouble shooting, general procedure adopted for fault, finding and trouble shooting, simple. Problems and their maintenance associated with piping systems, joints, valves and pumps.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge. Teacher will conduct lab assignments to make students practice their knowledge. Teacher will demonstrate the procedure of lab experiments.	08	04	Handouts, chalk board, PPT, text book, charts, lab.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal					
1	Pen Paper test/Theory Exam/practical Exam	Student will be asked to explain procedure for fault finding, and repair pumps, valves and joints.	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals			External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Nil												

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					C	0	2	3	0	2	5	1	
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTANCEANCE												
CO Description	To apply engineering aspects of industrial safety in chemical industries												
LO Description	to describe the aspects of industrial safety.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teac h Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	General aspects of industrial safety, industrial accidents, direct and indirect losses due to accidents, mechanical electrical and chemical accidents and preventions, industrial safety act 1948.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial. lab demonstration	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	08	05	Handouts, chalk board, PPT, text book, charts, lab.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Theory exam/Practical Exam	students will be asked to losses due to accidents.	10	(Test paper + Rating scale) and (Question paper +Rating scale)			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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				<i>C</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>2</i>	
COURSE NAME	CHEMICAL PROCESS UTILITIES AND MAINTENANCE											
CO Description	To apply engineering aspects of industrial safety in chemical industries											
LO Description	to follow provisions of industrial safety to combat accidents and hazards											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks			
1	Anatomy of fire, various steps in controlling fire hazards, fire extinguishers used for fire fighting, storage, handling and transportation of dangerous materials, personal protective devices used for safety, significance of colour coding	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge. Teacher will conduct lab assignments to make students practice their knowledge	09	03	Handouts, chalk board, PPT, text book, charts, lab.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal					
1	Pen Paper test/Theory Exam/practical Exam	Student will be asked to describe steps to control fire hazards and use personal protective devices.	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals			External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
nil												

Practical List

S.No.	NAME OF EXPERIMENT	CO	LO
1	Perform Proximate Analysis of coal.	1	1
2	Perform Ultimate Analysis of coal.	1	1
3	Determine calorific value of coal	1	2
4	Determine carbon residue of oil.	1	3
5	Determination of viscosity of diesel kerosene and lube oil	1	3
6	Determination of flash and fire point of diesel, kerosene and lube oil	1	3
7	Determination of smoke point of kerosene	1	3
8	Study of various steps of maintenance of pipe fitting	4	2
9	Study of various steps of maintenance of belt conveyor	4	2
10	Study of various steps of maintenance of elevator	4	2
11	Study of various steps of maintenance of pumps	4	2
12	Study of various steps of maintenance of pipe fitting	4	2
13	Study of various steps of maintenance of distillation column	4	2
14	To locate points of heat losses from a furnace and double pipe heat exchanger	3	1
15	study of personal protective devices	5	1