	NAME OF THE COURSE: CHMICAL PROCESS MATERIALS		
	CHEMICAL ENGINEERING DEPARTMENT		
IV SEM			
		HR S	MAX. MARKS
COURSE OUTCOME -1	To identify material properties in chemical plant.		
LEARNING OUTCOME -1	To identify engineering properties of material.	10	10
CONTENTS	Introduction, Mechenical properties of Material-Elasticity, Plasticity, Ductility, Brittleness, Hardness, Toughness Stiffness, Resilience Creep, Endurance, Strength.		
	Technological properties of Metal-Malleability, Machinability, Weldability, Formability, Castability.		
00115.55	Factors affecting the mechanical properties of metal		
COURSE OUTCOME -2	TO compare the properties of ferrous and nonferrous alloy.		
LEARNING OUTCOME -1	To explain the Iron Carbon phase diagram.	10	10
CONTE NTS	Ferrous materials-		
	Cooling curve for pure iron.		
	Iron carbon equilibrium diagram.		
	Micro constituents of steel and cast iron.		
	Alloys of cast iron and its industrial uses.		
	Alloys of steel and its uses.		
COURSE OUTCOME -2	To compare the properties of ferrous and nonferrous alloy.		
LEARNING OUTCOME -2	To explain the nonferrous alloys and their alloying element.	12	15
CONTE NTS	Various alloys of copper and their industrial application.		
	Various alloy of aluminum and their industrial application.		
	Various alloy of nickel and their industrial application		
COURSE OUTCOME -3	To improve properties of materials and test them		
LEARNING OUTCOME -1	To carry out different tests on materials	10	12

CONTE	Testing of materials-		
NTS	Tension test by UTM.		
	Compression test by UTM		
	Impact testing		
	· ·		
COURSE	Brinell Hardness testing To improve a grant and a state them.		
OUTCOME -3	To improve properties of materials and test them		
LEARNING	To explain the Heat treatment processes.	10	10
OUTCOME -2	To explain the freut treatment processes.	10	10
CONTE NTS	Heat treatments processes		
	Annealing		
	Normalizing		
	Hardening		
	Quenching		
	Tempering		
COURSE OUTCOME -4	To explain the materials with their application in chemical industry as materials of construction		
LEARNING OUTCOME -1	TO apply plastic ,rubber, ceramic in the industries as materials of construction.	10	15
CONTE NTS	Organic materials		
	Plastics- Definition, types of plastics and various industrial applications.		
	Rubber- Definition, types of rubber and various industrial applications.		
	Wood- Definition and applications.		
	Ceramic materials- Definition, classification of ceramic materials.		
COURSE OUTCOME -4	To explain the materials with their application in chemical industry as materials of construction		
LEARNING OUTCOME -2	To apply glass ,abrasives ,refectories as material of construction in chemical industries	10	15

CONTE NTS	Glass- Definition, various types of glasses and uses.		
	Abrasives- Definitions, various types of abrasives and uses.		
COLUBCE	Refractory- Definition, various types of refractory and uses.		
COURSE OUTCOME -5	TO understand corrosion with its prevention		
LEARNING OUTCOME -1	To prevent the corrosion in chemical industry.	10	10
CONTE NTS	Corrosion		
	Definition of corrosion		
	Various types of corrosion		
	Factors influencing corrosion		
0011202	Methods of combating corrosion		
COURSE OUTCOME -5	TO understand corrosion with its prevention	8	15
LEARNING OUTCOME -2	To select suitable material of construction in chemical industries		
CONTE NTS	Material Selection Criteria for important chemicals		
	Acids, alkali and organic solvents		

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME	Branch Code				ourse C	ode	CO Code	LO Code	Format No. 4
			\boldsymbol{C}	0	2				1	1	
COURSE NAME	Chemical Process Materials	hemical Process Materials									
CO Description	To identify material properties in chemical plant.										
LO Description	To identify engineering properties of material.										

SCHEME OFSTUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Introduction ,Mechanical properties of Material- Elasticity,Plasticity,Ductility,Brittleness,Hard ness,ToughnessStiffness,ResilienceCreep,En durance,Strength. Technological properties of Metal-Malleability, Machinability,Weldability,Formability,Casta bility.Factors affecting the mechanical properties of metal	Interactive classroom teaching, quiz, assignment, tutorials.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	08	02	Handouts, chalk board, PPT, text book.	

SCHEME OFASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Pen paper test	Student will be asked to explain Properties of material	10	Test paper + Rating scale	internal

R	RGPV (Diploma Wing) Bhopal		19I	SCHEME FOR LEARNING OUTCOME			ode	Course Code	CO Code	LO Code	Format No. 4
					C	0	2		2	1	_
	URSE AME	Chemical Process	Materials						<u>'</u>		
CO Des	scription	TO compare proj	perties of ferrous and nonfe	errous alloy.							
LO Des	scription	To explain the Iro	on Carbon phase diagram.								
		<u>'</u>		SCHEME OF STU	J DY						
S. No.	Lear	rning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.		ract. it Hrs.	LRs R	equired		Remarks
1	Ferrous ma	iterials-	Interactive classroom	Teacher will explain	08	02		Handouts,	chalk		
	Cooling cu	rve for pure iron.	teaching,	the contents and				board, PPT	, textbook	ζ.	
	Iron carbo	n equilibrium	demonstration, quiz,	provide handouts to							
	diagram.		assignments,	students. Teacher will							

SCHEME OF ASSESSMENT

conduct assignments/

quiz/tutorial to make

students practice their

knowledge.

cast iron.

industrial uses.

Micro constituents of steel and

Alloys of cast iron and its

Alloys ofsteel and its uses.

assignments, tutorial.

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External
1	theory exam	Student will be asked to explain ferrous material and its alloys.	10	Question paper +Rating scale	External

RGP	RGPV (Diploma Wing) Bhopal	SCHEME FOR OUTCO		Bra	nch Co	de	Coi	urse Cod	le Code	Code	Format No. 4	
					C	0	2			2	2	
	URSE AME	Chemical Process Mar	terials									
CO Des	scription	To compare the prope	erties of ferrous and nonf	errous alloy.								
LO Des	scription	To explain the nonfo	errous alloys and their a	lloying element.								
				SCHEME	OF STU	DY						
S. No.	Lea	arning Content	Teaching — Learning Method	Description of T-L Process		Te	each Hr	rs.	Pract. /Tut Hrs.	LRs Req	uired	Remarks
1	Various alloys of copper and their industrial application. Various alloy of aluminum and their industrial application. Various alloy of nickel and their industrial application.		Interactive classroom teaching, demonstration, quiz, assignments, Tutorial, presentation.	Teacher will explain contents and provide handouts to student Teacher will conduct assignments/ quiz/t to make students put their knowledge.	de its. ict tutorial	09			03	Handouts, ch board, charts, lab.		
				SCHEME OF	ASSESS	MENT	Γ					
S. No.	Method of Assessment Description of		Assessment Maximum Marks					Resources Required			External / Internal	
1	,	Theory Exam	Student will be asked to explain nonferrous material and their industrial		15			Oue	stion pane	ar Pating scala		external

CO

Question paper +Rating scale

LO

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

application.

R	GPV (Dip	ploma Wing) Bhoj	pal		FOR LEARNING TCOME	r :	Branch	Code	Co	Course Code		CO Code	LO Code	Format No. 4
					TCOME		C	2				3	1	
	URSE ME	Chemical Process M	aterials			·	·	<u>'</u>	·	·				
CO Des	scription	To improve proper	ties of mat	erials and test the	em.									
LO Des	cription	To carry out differ	ent tests o	n materials										
					SCHEME OF	STUD	Y							
S. No.	Lea	rning Content		ng –Learning Method	Description of Process	T-L	Teach Hrs.		ract. t Hrs.	I	Rs R	Required		Remarks
	Testing of materials- Tension test by UTM. Interactive teaching,d		ive classroom g,demonstration ssignments,	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.		08	02		Handouts, chalk board, PPT, textbook,		ok,			
	1			S	CHEME OF AS	SESSN	IENT							
S. No.	Meth	od of Assessment	D	escription of A	ssessment	Maxii Mai			R	esource	es Re	quired		External / Internal
1		theory exam	Stud	Student will be asked to describe Testing of materials.		12	Quest		Quest	uestion paper +Rating scale			le	External
			ADDIT	IONAL INSTR	RUCTIONS FOR	THE I	HOD/ F	ACUL	TY (I	F ANY)			
					Nil						•			

RG	SPV (Diplom	a Wing) Bhopa	SCHEME FOI OUTC		B	Branch C	Code 2	Co	ourse Code	CO Code	LO Code	Format No. 4
	URSE AME	hemical Process M	1aterials			, ,				J	2	
CO Des	scription To	improve proper	ties of materials and test then	n.								
LO Des	scription To	explain the Heat	t treatment processes.									
				SCHEME O	F STUDY	Y						
S. No.	Learnii	ng Content	Teaching –Learning Method	Description Proce		Teach Hrs.	/	ract. Fut Irs.	LRs I	Required		Remarks
1	Heat treatments processes Annealing Normalizing Hardening Quenching Tempering		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.		08 02					ook.	
	1		SC	HEME OF A	SSESSM	ENT						
S. No.	Method	of Assessment	Description of Asso	essment	Maxim Marl			Re	esources Re	quired		External / Internal
1	Pen	Paper test		Student will be asked to describe heat treatment processes.		Test pap		paper + Rat	ing scale		Internal	
			ADDITIONAL INSTRU	CTIONS FO	R THE H	OD/ FA	CUL'	ΓΥ (II	F ANY)			<u> </u>

Nil

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING	Brar	nch Code		Course Code	Code	Code	Format No. 4	
•	•	OUTCOME		0	2		4	1		
COURSE NAME	Chemical Process Materials	Chemical Process Materials								
CO Description	To explain the materials with their application in chemical industry as materials of construction.									
LO Description	TO apply plastic ,rubber, ceramic in the industries as materials of construction.									

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Organic materials Plastics- Definition, types of plastics and various industrial applications. Rubber- Definition, types of rubber and various industrial applications. Wood- Definition and applications. Ceramic materials- Definition, classification of ceramic materials.	tutorial.	Teacher will explain the contents andprovide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	08	02	Handouts, chalk board, charts.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory Exam	Student will be asked to describe plastic, rubber and ceramics.	15		External
		prostic, accordances.		Question paper +Rating scale	

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code		Course Code		CO Code	LO Code	Format No. 4
	3	OUTCOME		0	2			4	2	
COURSE NAME	Chemical Process Materials	Chemical Process Materials								
CO Description	To explain the materials with	n their application in chemical industry	as mate	erials	of cons	structio	on			
LO Description To apply glass ,abrasives ,refectories as material of construction 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	Glass- Definition, various types of glasses and uses.	Interactive classroom teaching, demonstration, quiz,	Teacher will explain the contents and provide handouts to students. Teacher will conduct	08	02	Handouts, chalk board, PPT, text book, charts.	
	Abrasives- Definitions, various types of abrasives and uses.	assignments, tutorial.	assignments/ quiz/tutorial to make students practice their knowledge				
	Refractory- Definition, various types of refractory and uses.						

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory Exam	Student will be asked to explain use of glass and refractory material.	15	Question paper +Rating scale	external

RGPV (Diploma Wing) Bhopal			al SCHI	$ \begin{array}{c c} \text{SCHEME FOR LEARNING} \\ \text{OUTCOME} \end{array} \qquad \begin{array}{c c} \text{Branch C} \\ \hline C & \theta \end{array} $			Code Course Cod			de Code Code		Format No. 4
Not v (Diploma vinig) Dilopai			2						5	1		
COURSE NAME Chemical Process Materi			aterials									1
CO Des	scription	TO understand cor	rosion with its preven	ntion.								
LO Des	scription	To prevent the cor	rosion in chemical in	dustry.								
				SCHEME OF ST	J DY							
S. No.	No. Learning Content		Teaching – Learning Method	Description of 7 Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required		ed	Remarks
1	Various ty Factors in	n of corrosion ypes of corrosion fluencing corrosion of combating	Interactive classroo teaching, demonstration, quiz assignments, tutoria lab demonstration	and provide handouts to s , Teacher will conduct assi	tudents gnment	i.	08	02	boa	ndouts, ord, PPT, ok, charts	text	
			I	SCHEME OFASSES	SMEN	Γ						
S No	Moth	ad of Assessment	Description	of Assessment Maxim	um Ma	arks		Racon	reas 1	Ragnirad	Exter	mal / Internal

SCHEME FOR LEARNING

Description of Assessment

Student will be asked describe

industrial corrosion.

S. No.

Method of Assessment

Pen paper test

Branch Code

CO

Resources Required

Test paper + Rating scale

Internal

Course Code

LO

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IFANY)

10

			SCHEME FOR OUTCO			Code 2	Course Code		Course Co		Course Co		Course Co		Course Code		CO Code 5	LO Code	Format No. 4										
	URSE AME	Chemical Process Materia	ls								_																		
CO De	scription	TO understand corrosion	n with its prevention																										
LO De	scription	To select suitable mate	rial of construction in c	chemical industr	ries.																								
				SCHEME O	FSTUDY	7																							
S. No.	S. No. Learning Content		Teaching – Learning Method	Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.		LRs Required		Remarks																	
1	1 Material Selection Criteria for important chemicals Acids, alkali and organic solvents		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		Handout chalk bo PPT, tex book, ch	ard, t																		
			S	CHEME OFA	SSESSM	ENT																							
S. No.	Meth	Method of Assessment Description of Asses		sessment	Maximum Marks			Resources Required			External / Internal																		
1		Theory Exam	Student will be asked material selection c	ed to explain criteria for			Question paper +Rating scale				External																		

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IFANY)
Nil

important chemicals.