

Branch

CHEMICAL

Semester

4

Course Code

Course Name

MECHANICAL OPERATION

Course Outcome 1	Student will be able to understand the properties and handling of particulates solids	Teaching Hours	Marks
Learning Outcome 1	Student will be able to explain the shape and size of particulate solids.	9	7
Contents	<b>Characterization of solid particles-</b> Characterization of Shape Characterization of size <b>Particle size analysis-</b> Differential and Cumulative analysis ,Specific surface of mixture, Average particle size ,Volume surface mean diameter, Arithmetic mean diameter, Mass mean diameter, Volume mean diameter , No. of particle in mixture.		
Method of Assessment	Lab internal test		
LO2	Student will able to learn and explain the different standard test screens.	8	10
Contents	<b>Screen Analysis-Standard screen series,simple problem on screen analysis</b> <b>Industrial screening equipments</b> -stationary screens & grizzlies,gyratory & vibratory screens,comparison of ideal & actual screens		
Method of Assessment	pen paper test		
LO3	student will be able to explain different technique of storage of solids.	6	6
Contents	Properties particulate masses-Storage of solids ,Bulk & bin storage,		
Method	pen paper test		

<b>od of Asses sment</b>			
<b>LO 4</b>	Student will be able to explain the screen capacity & determine screen effectiveness of given screening equipment.	8	10
<b>Conte nts</b>	<b>Material balance over screen- Screen effectiveness,capacity &amp; effectiveness of screen,Effect of mesh size on capacity of screen,sim[ple problem on screen effectiveness.</b>		
<b>Meth od of Asses sment</b>	Practical exam		
<b>Cour se Outc ome 2</b>	Students will be able to understand the size reduction of solids.		
<b>Lear ning Outc ome 1</b>	Students will be able to explain the theory of size reduction.	7	10
<b>Conte nts</b>	<b>Size Reduction</b> -Criteria of size reduction , Energy and Power requirement Crushing efficiency		
<b>Meth od of Asses sment</b>	Paper Pen Test		
<b>Lear ning Outc ome 2</b>	Students will able to explain the laws of crushing & to determine the Rittingers constant using jaw crusher.	6	10
<b>Conte nts</b>	<b>Law's of crushing</b> -Rittinger's law ,Kick's law ,Bond's law ,Work index, Simple problem		
<b>Meth od of Asses sment</b>	Practical Exam		
<b>LO3</b>	Students will be able to operate and control the size reduction equipments	10	10
<b>Conte nts</b>	<b>Size reduction equipment-</b> Principle, construction and working of crusher Principle, construction and working of grinders Principle, construction and working of ultra fine grinders, Principle, construction and working of cutting machines , Open circuit and closed circuit operation , Dry and wet operation		
<b>Meth</b>	Theory Exam		

<b>od of Assessment</b>			
<b>Course Outcome 3</b>	Students will be able to understand agitation and mixing operations.		
<b>Learning Outcome 1</b>	The student will be able to explain the agitation of fluids.	10	07
<b>Contents</b>	<b>Agitation of liquids</b> -Purpose of agitation, Agitation equipments ,Impellers ,Flow pattern in agitated vessels ,Prevention of swirling, Draft tube, Standard turbine design		
<b>Method of Assessment</b>	Lab internal test		
<b>Learning Outcome 2</b>	The student will able to explain the mixing technique of pastes.	9	10
<b>Contents</b>	<b>Mixing of pastes</b> -Representative types of mixers for paste ,Representative types of mixers for plastic masses ,Criteria of mixer effectiveness and mixing index ,Mixing of dry powders ,Representative types of mixers for dry powders ,Mixing index for granular solids ,mixing index at zero time ,Rate of mixing ,Simple problems on mixing index.		
<b>Method of Assessment</b>	Theory Exam		
<b>Course Outcome 4</b>	Students will able to understand the mechanical separation of solids.		
<b>Learning Outcome 1</b>	Students will able to explain drag, motion of the particles through fluids.	8	10
<b>Contents</b>	<b>Mechanical Separation</b> - Drag, drag coefficient and stoke's law ,Relation between drag coefficient and Reynolds number.,Motion of particles through fluid, Equation for one dimensional motion of particles through fluids, Terminal velocity, Motion of spherical particles, Free and Hindered settling, Separation of size by free settling and difference in density,		

<b>Method of Assessment</b>	theory exam		
<b>Learning Outcome 2</b>	Students will be able to learn sedimentation and perform batch settling test.	11	10
<b>Contents</b>	Sedimentation, Application of batch settling test to design thickner		
<b>Method of Assessment</b>	Practical Exam		
<b>Learning Outcome 3</b>	Students will able to explain the floatation, Electrostatic separator, cyclone separator and bag dust collector	9	10
<b>Contents</b>	Electrostatic separator , Cyclone separator , Bag dust Collector		
<b>Method of Assessment</b>	Theory Exam		
<b>Course Outcome 5</b>	Students will able to understand theory of filtration operations.		
<b>Learning Outcome 1</b>	Students will able to learn and explain types of filtration ,filter media and filter aids.	9	10
<b>Contents</b>	<b>Filtration</b> -Theory of filtration ,Relation between thickness of cake and volume of filtrate ,Constant rate and constant pressure filtration ,Filter media and filter aid		
<b>Method of Assessment</b>	Theory Exam		
<b>Learning</b>	Students will able to operate & control various filtration equipments.	9	10

<b>Outcome 2</b>			
<b>Contents</b>	Construction and working of plate and frame non washing and washing type ,Construction and working of chamber press ,Construction and working of leaf filter Construction and working of continuous rotary drum filter ,Simple problems		
<b>Method of Assessment</b>	Theory Exam		
<b>CO 6</b>	Students will able to understand the transportation and handling of solids.		
<b>Learning Outcome 1</b>	Students will able to explain the transport of solids.	8	10
<b>Contents</b>	Construction and working of Belt conveyor, belt drive arrangement, belt tensioning devices, driving sources, feeding and discharge arrangements		
<b>Method of Assessment</b>	Theory Exam		
<b>Learning Outcome 2</b>	Students will able to operate & control the various conveying & elevating equipments	8	10
<b>Contents</b>	Construction and working of Screw conveyor and bucket elevator ,Construction and working of Pneumatic conveying system, positive and negative pressure system Packaging.		
<b>Method of Assessment</b>	Theory Exam		

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				1	1	
<b>COURSE NAME</b>	MECHANICAL OPERATION												
<b>CO Description</b>	Student will be able to understand the properties and handling of particulate solids.												
<b>LO Description</b>	Student will be able to explain the shape and size of particulate solids.												
SCHEME OFSTUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	<b>Properties and handling of particulate solids-</b> Characterization of solid particles , Characterization of Shape ,Characterization of size Particle size analysis , Differential and Cumulative analysis , Specific surface of mixture , Average particle size Volume surface mean diameter, Arithmetic mean diameter, Mass mean diameter, Volume mean diameter, No. of particle in mixture	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	05	04	Handouts, chalk board, PPT, text book.lab manual							
SCHEME OFASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	07	Rating Scale			Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>		<b>Branch Code</b>			<b>Course Code</b>			<b>CO Code</b>	<b>LO Code</b>	<b>Format No.</b>
				<i>C</i>	<i>0</i>	<i>2</i>				<i>1</i>	<i>2</i>	<b>4</b>
<b>COURSE NAME</b>	MECHANICAL OPERATION											
<b>CO Description</b>	Student will be able to understand the properties and handling of particulate solids.											
<b>LO Description</b>	Student will able to learn and explain the different standard test screens.											
<b>SCHEME OF STUDY</b>												
<b>S. No.</b>	<b>.Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>	<b>Remarks</b>					
	<b>Screen analysis</b> -standard screen series,simple problems on screen analysis. <b>Industrial screening Equipments</b> -Stantionary screens & grizzels,Gyrating & vibrating screens,comparison of ideal & actual screens	Interactive classroom teaching, demonstration, quiz, assignments, tutorial , presentation, 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.	05	03	Handouts, chalk board, charts,						
<b>SCHEME OFASSESSMENT</b>												
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>	<b>Maximum Marks</b>	<b>Resources Required</b>			<b>External / Internal</b>					
1	Paper Pen Test	Theory question (including simple numerical problem) related to the learned content will be asked in the test paper	10	Test Paper + Rating Scale			Internal					
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>												
Nil												

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>		<b>Branch Code</b>			<b>Course Code</b>			<b>CO Code</b>	<b>LO Code</b>	<b>Format No. 4</b>
				<i>C</i>	<i>0</i>	<i>2</i>				<i>1</i>	<i>3</i>	
<b>COURSE NAME</b>	<b>MECHANICAL OPERATION</b>											
<b>CO Description</b>	Student will be able to understand the properties and handling of particulate solids.											
<b>LO Description</b>	student will be able to explain different technique of storage of solid.											
<b>SCHEME OF STUDY</b>												
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>			<b>Remarks</b>			
1	<b>Properties of particulate masses</b> -Storage of solids,Bulk & Bin storage	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	01	Handouts, chalk board, PPT, text book,						
<b>SCHEME OF ASSESSMENT</b>												
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>	<b>Maximum Marks</b>	<b>Resources Required</b>			<b>External / Internal</b>					
1	Paper Pen Test	Theory question (including simple numerical problem) related to the learned content will be asked in the test paper	06	Test Paper + Rating Scale			Internal					
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>												
Nil												

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code			Course Code			CO Code	LO Code	Format No. 4
				C	0	2				1	4	
<b>COURSE NAME</b>	MECHANICAL OPERATION											
<b>CO Description</b>	Student will be able to understand the properties and handling of particulate solids.											
<b>LO Description</b>	Student will be able to the screen capacity & determine screen effectiveness of given screening equipment.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	<b>Material balance over screen-</b> Screen effectiveness, Capacity and effectiveness of screen, Effect of mesh size on capacity of screen, Simple problem on screeneffectiveness.	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	03	05	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	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	10	Rating Scale			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. 4
				C	0	2				2	1	
<b>COURSE NAME</b>	MECHANICAL OPERATION											
<b>CO Description</b>	Students will be able to understand the size reduction of solids.											
<b>LO Description</b>	Students will be able to explain the theory of size reduction.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	<b>Size Reduction</b> -Criteria of size reduction, Energy and Power requirement, Crushing efficiency	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	2	Handouts, chalk board, charts, ,						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal					
1	Paper Pen Test	Theory question (including simple numerical problem) related to the learned content will be asked in the test paper	10	Test Paper + Rating Scale			Internal					
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. 4
				C	0	2				2	2	
<b>COURSE NAME</b>	MECHANICAL OPERATION											
<b>CO Description</b>	Students will be able to understand the size reduction of solids.											
<b>LO Description</b>	Students will able to explain the laws of crushing and to determine Rittingers constant using Jaw crusher.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	<b>Laws of crushing-Rittingers</b> Law,kicks law,Bonds law,work index	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.	05	01	Handouts, chalk board, PPT, text book, charts.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	Internal							
1	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	10	Rating Scale	External							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Nil												

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>			<b>Branch Code</b>			<b>Course Code</b>			<b>CO Code</b>	<b>LO Code</b>	Format No. 4
					<i>C</i>	<i>0</i>	<i>2</i>				2	3	
<b>COURSE NAME</b>	MECHANICAL OPERATION												
<b>CO Description</b>	Students will be able to understand the size reduction of solids.												
<b>LO Description</b>	Students will be able to operate & control the size reduction equipments.												
<b>SCHEME OF STUDY</b>													
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching – Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>			<b>Remarks</b>				
1	<b>Size reduction equipments-</b> Principle,construction & working of crushers,grinders,ultrafine grinders & cutting machines,open & close circuit operations,simple problems	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	05	Handouts, chalk board, PPT, text book, charts.							
<b>SCHEME OFASSESSMENT</b>													
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>	<b>Maximum Marks</b>	<b>Resources Required</b>			<b>External / Internal</b>						
1	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper			External						
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IFANY)</b>													
Nil													

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>		<b>Branch Code</b>		<b>Course Code</b>		<b>CO Code</b>	<b>LO Code</b>	<b>Format No. 4</b>
				<i>C</i>	<i>0</i>	<i>2</i>		<i>3</i>	<i>1</i>	
<b>COURSE NAME</b>	<b>MECHANICAL OPERATION</b>									
<b>CO Description</b>	Students will be able to understand agitation and mixing operations.									
<b>LO Description</b>	The student will be able to explain the agitation of fluids.									
<b>SCHEME OF STUDY</b>										
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>	<b>Remarks</b>			
1	Agitation of liquids-Purpose of agitation, Agitation equipment ,Impellers ,Flow pattern in agitated vessels ,Prevention of swirling ,Draft tubes ,Standard turbine design	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. Teacher will demonstrate the procedure of lab experiments.	07	03	Handouts, chalk board, PPT, text book, charts, lab.				
<b>SCHEME OF ASSESSMENT</b>										
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>	<b>Maximum Marks</b>	<b>Resources Required</b>			<b>External / Internal</b>			
1	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will assess correctness of result	7	Rating Scale			Internal			
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>										
Nil										

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				3	2	
<b>COURSE NAME</b>		<b>MECHANICAL OPERATION</b>											
<b>CO Description</b>		Students will be able to understand agitation and mixing operations.											
<b>LO Description</b>		The student will able to explain the mixing technique of pastes.											
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	Mixing of pastes - Representative types of mixers for paste Representative types of mixers for plastic masses Criteria of mixer effectiveness and mixing index ,Mixing of dry powders ,Representative types of mixers for dry powders ,Mixing index for granular solids ,mixing index at zero time ,Rate of mixing Simple problems on mixing index.	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.	06	03	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	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>		<b>Branch Code</b>			<b>Course Code</b>			<b>CO Code</b>	<b>LO Code</b>	Format No. 4
				<i>C</i>	<i>0</i>	<i>2</i>				<i>4</i>	<i>1</i>	
<b>COURSE NAME</b>	Mechanical operation											
<b>CO Description</b>	Students will able to understand the mechanical separation of solids.											
<b>LO Description</b>	Students will able to explain drag, motion of the particles through fluids.											
<b>SCHEME OF STUDY</b>												
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>			<b>Remarks</b>			
1	<b>Mechanical Separation</b> -Drag, drag coefficient and stoke's law Relation between drag coefficient and Reynolds number.Motion of particles through fluids, Equation for one dimensional motion of particles through fluids ,Terminal velocity, Motion of spherical particles, Free and Hindered settling ,Separation of size by free settling and difference in density.	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, charts,						
<b>SCHEME OF ASSESSMENT</b>												
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>	<b>Maximum Marks</b>	<b>Resources Required</b>			<b>External / Internal</b>					
1	Theory exam	Theory questions related to the learned content will be asked in the university question paper	10	question paper			external					
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>												
Nil												

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				4	2	
<b>COURSE NAME</b>		Mechanical operation											
<b>CO Description</b>		Students will able to understand the mechanical separation of solids.											
<b>LO Description</b>		Students will be able to learn sedimentation and perform batch settling test.											
<b>SCHEME OF STUDY</b>													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	<b>Sedimentation-</b> Application of batch settling test to design the thickner	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	07	04	Handouts, chalk board, PPT, text book, charts, lab.							
<b>SCHEME OF ASSESSMENT</b>													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Laboratory Test by observation	Examiner will ask to students to take reading and then calculate in front of him and will asses correctness of result	10	Rating Scale	External								
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
Nil													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				4	3	
<b>COURSE NAME</b>	Mechanical operation												
<b>CO Description</b>	Students will able to understand the mechanical separation of solids.												
<b>LO Description</b>	Students will able to explain the floatation, ESP, cyclone separator and bag dust collector.												
<b>SCHEME OFSTUDY</b>													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Electrostatic separator, Cyclone separator, Bag dust Collector	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	04	Handouts, chalk board PPT,							
<b>SCHEME OFASSESSMENT</b>													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper			External						
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
NIL													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				5	1	
<b>COURSE NAME</b>	Mechanical operation												
<b>CO Description</b>	Students will able to understand theory of filtration operations.												
<b>LO Description</b>	Students will able to learn and explaintypes of filtration,filter media,& filter aids..												
<b>SCHEME OFSTUDY</b>													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	<b>Filtration</b> -Theory of filtration Relation between thickness of cake and volume of filtrate Constant rate and constant pressure filtration ,Filter media and filter aid	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	02	Handouts, chalk board PPT,							
<b>SCHEME OFASSESSMENT</b>													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper			External						
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
NIL													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				5	2	
<b>COURSE NAME</b>	Mechanical operation												
<b>CO Description</b>	<b>Students will able to understand theory of filtration operations</b>												
<b>LO Description</b>	Students will able to control & operate various filtration equipments.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Construction and working of plate and frame non washing and washing type ,Construction and working of chamber press Construction and working of leaf filter ,Construction and working of continuous rotary drum filter Simple problems	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	02	Handouts, chalk board, charts, video film, virtual							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nli													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				6	1	
<b>COURSE NAME</b>	Mechanical operation												
<b>CO Description</b>	Students will able to understand the transportation and handling of solids.												
<b>LO Description</b>	Students will able to explain the transport of solids.												
SCHEME OFSTUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	<b>Handling of solids-</b> Construction and working of Belt conveyor, belt drive arrangement, belt tensioning devices, driving sources, feeding and discharge arrangements.	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	02	Handouts, chalk board PPT,							
SCHEME OFASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					C	0	2				6	2	
<b>COURSE NAME</b>	Mechanical operation												
<b>CO Description</b>	Students will able to understand the transportation and handling of solids.												
<b>LO Description</b>	Students will able to operate & control various conveying&elevating equipments.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Construction and working of Screw conveyor and bucket elevator ,Construction and working of Pneumatic conveying system, positive and negative pressure system , Packaging	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	07	02	Handouts, chalk board, charts, video film, virtual lab.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Theory Exam	Theory questions related to the learned content will be asked in the university question paper	10	Question paper			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

