RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		C	*0*	*2*	*3*	*0*	*2*	*1*	*1*	

COURSE NAME	CHEMICAL TECHNOLOGY - I
CO Description	Use sulfur and sulphuric acid as raw material for appropriate process
LO Description	Concept of unit operations and unit processes

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 unit operations and unit processes, difference between unit operations and unit processes, schematic representation of different unit operations and unit processes	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.	3	1	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 explain unit operations and unit processes	10	(Test paper + Rating scale) and (Question paper +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*	*3*	*0*	*2*	*1*	*2*	

COURSE NAME	CHEMICAL TECHNOLOGY – I
CO Description	Use sulfur and sulphuric acid as raw material for appropriate process
LO Description	To Draw process flow diagram for mining of sulfur

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Sulfur industry, Physical and chemical properties, Process description and flow chart, Frasch process, Oxidation-reduction of H2S,Iron pyrites (Finish Process), Major engineering problems, Uses and economics	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.	4	2	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 explain the methods adopted to mine sulfur	10	(Test paper + Rating scale) and (Question 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*	*3*	*0*	*2*	*1*	*3*	

COURSE NAME	CHEMICAL TECHNOLOGY - I
CO Description	Use sulfur and sulphuric acid as raw material for appropriate process
LO Description	Select appropriate processes for the production of suphuric acid.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Sulphuric acid, Physical and chemical properties, Process description and flow chart of Contact process, Major engineering problems, Uses and economics, other obsolete processes and reason for their absolution	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/practical Exam	Student will be asked to explain production and application of sulphuric acid	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals	Internal (Practical)

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*	*3*	*0*	*2*	*1*	*4*	

COURSE NAME	CHEMICAL TECHNOLOGY -
CO Description	Use sulfur and sulphuric acid as raw material for appropriate process
LO Description	Identify the raw materials for manufacturing of glass

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Composition, Raw material, Methods of manufacturing, Manufacturing of special glasses-fused silica & high silica glass, building construction glass	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.	04	01	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 different types of glass	10	(Test paper + Rating scale) and (Question 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*	*3*	*0*	*2*	*2*	*1*	

COURSE NAME	CHEMICAL TECHNOLOGY - I
CO Description	Describe properties and manufacturing processes of chloro alkali chemicals
LO Description	Identify soda ash based on chemical and physical properties.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Soda ash (Sodium carbonate), Physical and chemical properties , Method of production and flow sheet, Solvay process, Dual process, Major engineering problems, Uses and economics.	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	08	02	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 describe different processes for soda ash manufacturing and their application.	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. **4**
		C	*0*	*2*	*3*	*0*	*2*	*2*	*2*	

COURSE NAME	CHEMICAL TECHNOLOGY - I
CO Description	Describe properties and manufacturing processes of chloro alkali chemicals.
LO Description	Compare processes for the production of caustic soda.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	. Caustic soda-chlorine process, Physical and chemical properties , Method of production and flow chart, Electrolytic process, Membrane cell process, Major engineering problems , Uses and economics, Hydrochloric acid ,Physical and chemical properties, Method of, production of hydrochloride, Major engineering problems, Uses and economics	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	2	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 different processes for soda ash manufacturing and their application	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. **4**
		C	*0*	*2*	*3*	*0*	*2*	*2*	*3*	

COURSE NAME	CHEMICAL TECHNOLOGY – I
CO Description	Describe properties and manufacturing processes of chloro alkali chemicals.
LO Description	Use bleaching powder judiciously as per need.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Bleaching powder, Introduction, Physical and chemical properties, Method of production , Major engineering problems, Uses and economics	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	External / Internal
1	Pen Paper test/Theory Exam/practical Exam	Student will be asked to explain bleaching powder and its uses.	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. **4**
		C	*0*	*2*	*3*	*0*	*2*	*3*	*1*	

COURSE NAME	CHEMICAL TECHNOLOGY - I.
CO Description	Identify properties of industrial gases and manufacture industrial gases on small scale
LO Description	Identify gas handling equipments based on properties of gases.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Industrial gases : Brief knowledge of gases viz. hydrogen, oxygen, water gas, producer gas, carbureted water gas , nitrogen, acetylene gas, Physical and chemical properties, Method of production , Major engineering problems, Uses and economics	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.	08	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	Student will be asked describe different industrial gases with their applications.	10	(Test paper + Rating scale) and (Question 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*	*3*	*0*	*2*	*3*	*2*	

COURSE NAME	CHEMICAL TECHNOLOGY - I
CO Description	Identify properties of industrial gases and manufacture industrial gases on small scale
LO Description	Select equipment for production of ammonia/urea

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Nitrogen Industries: Ammonia , Physical and chemical properties , Method of production, Major engineering problems, Uses and economics, Nitric Acid, Physical and chemical properties, Method of production, Major engineering problem, Uses and economics, Urea: Physical and chemical properties, Method of production. Major engineering problem, Uses and economics	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.	08	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 explain production processes and applications of nitrogen products.	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals	External Theory &Internal practical

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*	*3*	*0*	*2*	*4*	*1*	

COURSE NAME	CHEMICAL TECHNOLOGY – I
CO Description	Identify engineering problems in production processes of Phosphorous Industries
LO Description	Identify equipments for the production of Phosphoric acid

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Phosphorus, phosphoric acid, Physical and chemical properties, Process description and flow chart, Major engineering problem , Uses and economics	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	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	Student will be asked to describe production method of phosphorous and phosphoric acid and their testing	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals	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*	*3*	*0*	*2*	*4*	*2*	

COURSE NAME	CHEMICAL TECHNOLOGY – I
CO Description	Identify engineering problems in production processes of Phosphorous Industries
LO Description	Identify major Engineering problems associated with the production of phosphorus based fertilizers

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Super phosphate and triple super phosphate , Physical and chemical properties, Process description and flow chart, Major engineering problem, Uses and economics	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	02	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 large scale production of phosphorus based fertilizers with 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. **4**
		C	*0*	*2*	*3*	*0*	*2*	*5*	*1*	

COURSE NAME	CHEMICAL TECHNOLOGY - I
CO Description	manufacture surface coating and finishing products.
LO Description	Explain different type of paint and varnishes on the basis of chemical and physical properties

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Paints and Varnishes, Introduction, Difference between paints, varnishes and lacquers, Types of paints, varnishes and lacquers, Manufacture of paints, varnishes and lacquers	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, 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	Student will be asked to describe various paint, varnishes and laquars	10	(Test paper + Rating scale) and (Question paper +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**
		M	*0*	*2*	*3*	*0*	*2*	*5*	*2*	

COURSE NAME	CHEMICAL TECHNOLOGY – I
CO Description	manufacture surface coating and finishing products**..**
LO Description	Use different pigments for paint and varnish preparation.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Uses of White lead, Titanium oxide, Zinc oxide, lithophone, lead chromate, copper sulfate and iron oxide in paint and varnish industries.	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	05	02	Handouts, chalk board PPT, lab.	

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 production process for the production of paint and varnishes.	10	(Test paper + Rating scale) and (Question paper +Rating scale)	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*	*3*	*0*	*2*	*5*	*3*	

COURSE NAME	CHEMICAL TECHNOLOGY – I
CO Description	manufacture surface coating and finishing products**.**
LO Description	manufacture cement as per end uses

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	physical and chemical properties of clinker,types of cement ,process description and flow chart,wet and dry process,portland cement production,major sngineering problems , uses and economics,different water proofing agents and there functioning, and prodution methods	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	08	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	Pen Paper test/Theory Exam/practical Exam	Student will be asked to describe manufacturing and properties of various grade cements with their testing.	10	(Test paper + Rating scale)/ (Question paper +Rating scale) and rating scale for practicals	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nli

List of Practicals

S.No.	NAME OF EXPERIMENT	CO	LO
1	Determine Purity of given sample of H_2SO_4	1	2
2	Determine Purity of given sample of Sodium Carbonate.	2	1
3	Prepare caustic soda by chemical method	2	2
4	To determine the available chlorine in the given sample of bleaching powder by the Iodometric method	2	3
5	Determine nitrogen content in fertilizer by Kjeldahl method.	3	2
6	Determine purity of HNO_3	3	2
7	Prepare urea formaldehyde resin	3	2
8	Determine the percentage of phosphorous in calcium phosphate sample .	4	2
9	Determine the percentage of phosphorous in triple super phosphate sample.	4	2
10	Determine the percentage of phosphorous in single superphosphate sample	4	2
11	Measure viscosity of paint/varnish with the help of dip Cup and flow cup viscometer	5	1
12	Measure viscosity of paint/varnish with the help of bubble and rotational viscometer	5	1