

Branch

CHEMICAL

Semester

5

Course Code

Course Name

PETROLEUM REFINARY

Course Outcome 1	Describe origin, formation and composition of petroleum	Teach Hrs	Marks
Learning Outcome 1	Student will be able to explain origin and formation of Petroleum for Industry.	06	08
Contents	Introduction of Petroleum Origin and formation of Petroleum; Occurrence of petroleum Origin and formation Organic Theories Physical Method Biological Method Oil exploration and production method		
Method of Assessment	Pen paper test		
Learning Outcome 2	Student will be able to estimate total oil reserves and classify petroleum on the basis of composition	06	08
Contents	Reserves and Deposits of World; Petro Glimpses and Petroleum Industry in India Composition of Petroleum Classification of petroleum.		
Method of Assessment	Theory exam		
Course Outcome 2	Student will be able to Interpret Petroleum processing data		
Learning Outcome 1	Student will be able to evaluate properties of Petroleum fraction	08	10
Contents	Evaluation of Petroleum U.O.P. characterization factor Correlation index Distillation characteristics		

	Thermal Properties of petroleum fractions. Specific heat Viscosity and Viscosity index Viscosity gravity constant Thermo viscosity		
Method of Assessment	Theory exam		
Learning Outcome 2	Student will be able to evaluate Distillation characteristics of Petroleum fraction	30	20
Contents	Distillation characteristics, Thermal Properties of petroleum fractions. Specific heat Viscosity and Viscosity index Viscosity gravity constant Thermo viscosity		
Method of Assessment	Practical exam		
Learning Outcome 3	Student will be able to explain important properties and their test methods	10	10
Contents	Important Products – Refinery Gas, Natural gas, associated gas, Dissolved gas, Casing head gas, Refinery off gas, LPG. Properties and Test Methods. Test for gasoline, Aviation turbine Fuels, Naphtha, Kerosene's, Diesel, Lube oil-ASTM distillation, Reid vapor pressure, Octane number, Gum content, Sulfur content, Flash point and Fire point, Smoke point, Volatility, Sulfur content, Aniline point, Diesel index, Calorific value, Viscosity, Conradson method, Oxidation stability		
Method of Assessment	Theory exam		
Learning Outcome 4	Perform Important test on petroleum and its products in laboratory	15	10
Contents	Properties and Test Methods. Test for gasoline, Aviation turbine Fuels, Naphtha, Kerosene's, Diesel, Lube oil-ASTM distillation, Reid vapor pressure, Octane number, Gum content, Sulfur content Flash point and Fire point, Smoke point, Volatility, Sulfur content, Aniline point, Diesel index, Calorific value, Viscosity, Conradson method, Oxidation stability		
Method of Assessment	Practical exam	03	30
Course Outcome 3	Student will be able to compare fractions of Petroleum.		
Learning Outcome 1	Student will be able to describe Pre-treatment of petroleum of curds.	10	10

Contents	Production of petroleum Pretreatment of petroleum crude Dehydration of Crud Desalting of Crudes – Electric Desalting Chemical treatment Gravity settling Centrifugal separation Stabilization of crude Catalytic desulphurization process Deasphalting process		
Method of Assessment	Pen paper test		
Learning Outcome 2	Student will be able to perform distillation in Petroleum Industry.	10	10
Contents	Distillation of Petroleum- Arrangement of towers Top tray reflux Pump back reflux and Pump around reflux towers Types of Distillation – Atmospheric distillation unit Vacuum Distillation unit Corrosion in distillation unit		
Method of Assessment	Theory Exam		
Learning Outcome 3	Student will be able to explain types of refineries and gasoline blending.	08	10
Contents	Petroleum refinery Classification Simple refinery Complex refinery Fully integrated refinery Refinery product Blending of Gasoline Batch type blending Continuous blending Blending Process, Line blending Gasoline Blending.,		
Method of Assessment	Pen paper test		
Course Outcome 4	Student will be able to understand treatment techniques for Petroleum and its products	12	12
Learning	Student will be able to treat Gasoline, Kerosin, lubes and wax		

Outcome 1			
Contents	Fraction: - Impurities Physical or Mechanical impurities Chemical impurities Purification of Petroleum Gasoline Treatment Sweetening process Doctor sweetening process Copper chloride sweetening process Solutizer sweetening process Hydro filling process Treatment of Kerosine. Treatment of lubes Sulphuric acid treatment process Clay treatment process Wax purification Dewaxing process Chilling and pressing method Propane dewaxing process Urea dewaxing process		
Method of Assessment	Theory Exam		
Course Outcome 5	Students will be able to understand thermal and catalytic properties.		
Learning Outcome 2	Students will be able to explain thermal and catalytical cracking.	10	10
Contents	Cracking Thermal and Catalytic Cracking. Thermal cracking process Dubbs thermal cracking process Pyrolysis Visbreaking Coking Catalytic cracking Hourdrys fixed bed cracking Thermofer catalytic cracking Fluidised bed cracking Hydrocracking Naphtha Cracking.		
Method of Assessment	Theory exam		
Learning Outcome 2	Students will be able to Explain thermal and catalytic Reforming	10	10
Contents	Reforming Thermal and Catalytic reforming,		

	Comercial catalytic reforming process Fixed bed process Non regenerative process Regenerative process Moving bed process Thermofor catalytic reforming process Hyperforming process Fluidised bed process Fludised hydro forming process		
Method of Assessment	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	
COURSE NAME	Petroleum refinery												
CO Description	Describe origin, formation and composition of petroleum.												
LO Description	Explain origin and formation of Petroleum.												
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 of Petroleum,	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.	06		Handouts, chalk board, PPT, text book.							
2	Origin and formation of Petroleum;												
3	Occurrence of petroleum, Origin and formation, Organic Theories, Physical Method Biological Method. Oil exploration and production methods												
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External /Internal								
1	Pen paper test	Student will be asked to explain origin and formation of Petroleum.	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		
					<i>C</i>						<i>1</i>		<i>2</i>				
COURSE NAME		Petroleum refinery															
CO Description		Describe origin, formation and composition of petroleum															
LO Description		Estimate total oil reserves and classify petroleum on the basis of composition.															
SCHEME OF STUDY																	
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required						Remarks					
1	Reserves and Deposits of World;	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	00	Handouts, chalk board, PPT, textbook.											
2	Petro Glimpses and Petroleum Industry in India																
3	Composition of Petroleum Classification of petroleum.																
SCHEME OF ASSESSMENT																	
S. No.	Method of Assessment	Description of Assessment			Maximum Marks		Resources Required						External /Internal				

1	Theory Exam	Questions related to oil reserves, composition and classification	08	(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.
				C	0	2				2	1	4
COURSE NAME		Petroleum refinery										
CO Description		Interpret Petroleum processing data										
LO Description		Evaluate properties of Petroleum fraction										
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	Evaluation of Petroleum,U.O.P. characterization factor	Interactive classroom teaching, demonstration, quiz, assignments, Tutorial, presentation.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	08	00	Handouts, chalk board, charts.						
2	Correlation index, Distillation characteristics,											
3	Thermal Properties of petroleum fractions. Specific heat.											
4	Viscosity and Viscosity index.											
5	Viscosity gravity constant Thermo viscosity.											
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 Properties of petroleum fractions.	10	(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.
		<i>C</i>	<i>0</i>	<i>2</i>				<i>2</i>	<i>2</i>	4

COURSE NAME	Petroleum refinery
CO Description	Interpret Petroleum processing data
LO Description	Evaluate Distillation characteristics of Petroleum fraction

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1 2 3 4 5	Distillation characteristics, Thermal Properties of petroleum fractions. Specific heat Viscosity and Viscosity index Viscosity gravity constant Thermo viscosity	Lab -demonstration.	Teacher will explain the contents and provide handouts to students. Teacher will conduct lab assignments to make students practice their knowledge. Teacher will demonstrate the procedure of lab experiments Lab - demonstration	30	03	Handouts, chalk board, charts,Lab.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
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1	Practical exam	Student will be asked to evaluate Distillation characteristics of Petroleum fraction	20	rating scale for practical's	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
		<i>C</i>	<i>0</i>	<i>2</i>				2	3	

COURSE NAME	Petroleum refinery
CO Description	Interpret Petroleum processing data
LO Description	Explain Important properties and their test methods.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1 2	Important Products – Refinery Gas, Natural gas, associated gas, Dissolved gas, Casing head gas, Refinery off gas, LPG. Properties and Test Methods. Test for gasoline, Aviation turbine Fuels, Naphtha, Kerosene's, Diesel, Lube oil-ASTM distillation, Reid vapor pressure, Octane number, Gum content, Sulfur content, Flash point and Fire point, Smokepoint, Volatility, Sulfur content, Aniline point, Diesel index, Calorific value, Viscosity, Conradson method, Oxidation stability	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.	10	00	Handouts, chalk board, PPT, textbook,	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
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1	Theory exam	Student will be asked to describe Testing of materials.	10	(Question paper +Rating scale)	External
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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	4	

COURSE NAME	Petroleum refinery
CO Description	Interpret Petroleum processing data
LO Description	Perform Important test on petroleum and its products in laboratory.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Properties and Test Methods.	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 demonstrate the procedure of lab experiments Lab - demonstration	00	30	Handouts, chalk board, PPT, textbook, La	
2	Test for gasoline, Aviation turbine Fuels, Naphtha, Kerosene's, Diesel, Lube oil-ASTM distillation, Reid vapor pressure, Octane number, Gum content, Sulfur content, Flash point and Fire point, Smoke point, Volatility, Sulfur content, Aniline point, Diesel index, Calorific value, Viscosity,						

Conradson method, Oxidation stability							
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SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Practical exam	Student will be asked to perform Testing of materials.	30	rating scale for practical's	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	1	
COURSE NAME	Petroleum refinery												
CO Description	Compare fractions of Petroleum.												
LO Description	Describe Pretreatment of petroleum.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1 2 3 4 5 6 7 8 9 10	Production of petroleum Pretreatment of petroleum crude Dehydration of Crude Desalting of Crudes – Electric Desalting Chemical treatment Gravity settling Centrifugal separation Stabilization of crude Catalytic desulphurization process Deasphalting process	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.	10	00	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	Questions related to pretreatment of crude will be asked	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				3	2	
COURSE NAME	Petroleum refinery											
CO Description	To Compare fractions of Petroleum.											
LO Description	Perform distillation in Petroleum in Industry.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1 2 3 4	Distillation of Petroleum- Arrangement of towers Top tray reflux Pump back reflux and Pump around reflux towers Types of Distillation – Atmospheric distillation unit Vacuum Distillation unit Corrosion in distillation unit	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.	10	00	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 Distillation used in Petroleum Industry.	10	(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
					<i>C</i>	<i>0</i>	<i>2</i>				3	3	
COURSE NAME	Petroleum refinery												
CO Description	To Compare fractions of Petroleum.												
LO Description	To explain types of refineries and gasoline blending												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required						Remarks	
1 2 3	Petroleum refinery: Classification, Simple refinery, Complex refinery, Fully integrated refinery, Refinery product, Blending of Gasoline, Batch type blending, Continuous blending, Blending Process, Lineblending Gasoline Blending.	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	00	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	Student will be asked to explain Blending Process.	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				4	1	
COURSE NAME	Petroleum refinery												
CO Description	To understand treatment techniques for Petroleum and its products												
LO Description	To treat Gasoline, Kerosene ,lubes and wax												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1 2 3 4 5 6 7	Fraction: - Impurities Physical or Mechanical impurities Chemical impurities Purification of Petroleum Gasoline Treatment Sweetening process Doctor sweetening process Copper chloride sweetening process Solutizer sweetening process Hydro filling process Treatment of Kerosine. Treatment of lubes Sulphuric acid treatment process Clay treatment process Wax purification Dewaxing process Chilling and pressing method Propane dewaxing process Urea dewaxing process	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.	12	00	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	Student will be asked to Gasoline Treatment and Treatment of Kerosine.	12	(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				5	1	
COURSE NAME	Petroleum refinery												
CO Description	To understand thermal and catalytic properties												
LO Description	To explain thermal and catalytic cracking.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1 2 3 4	Cracking Thermal and Catalytic Cracking. Thermal cracking process Dubbs thermal cracking process Pyrolysis Visbreaking Coking Catalytic cracking Hourdrys fixed bed cracking Thermofer catalytic cracking Fludised bed cracking Hydrocracking Naphtha Cracking.	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.	10	00	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	Student will be asked to describe Cracking	10	(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				5	2	
COURSE NAME	Petroleum refinery											
CO Description	To understand thermal and catalytic properties											
LO Description	Explain thermal and catalytic Reforming											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1 2	Reforming Thermal and Catalytic reforming, Comercial catalytic reforming process Fixed bed process Non regenerative process Regenerative process Moving bed process Thermoforming, catalytic reforming process Hyperforming process Fluidized bed process Fludized hydro forming process	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.	10	00	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	Student will be asked to describe reforming.	10	(Question paper +Rating scale)	External
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ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

nil

S.No.	NAME OF EXPERIMENT	CO	LO
1	Determine the viscosity of given oil sample by red wood viscometer (No. 1)	2	2
2	Determine the viscosity of given oil sample by red wood viscometer (No. 2)	2	2
3	Determine the flash point and fire point of given oil sample by Pensky – martin apparatus. (Open cup)	2	4
4	Determine the flash point and fire point of given oil sample by Pensky – martin apparatus. (Close cup)	2	4
5	Determine the flash point and fire point of given oil sample by Abels apparatus.	2	4
6	Determine the composition of an unknown oil petroleum mixture using the Ostwald viscometer.	2	2
7	Determine the distillation characteristics of petroleum products.	2	2
8	Determine the drop point of grease.	2	4
9	Determine pour point of oil sample.	2	4
10	Determine the Conradson carbon residue.	2	4
11	Determine the smoke point of given kerosene sample.	2	4
12	Determine the penetration index by penetrometer.	2	4

