

RGPV (DIPLOMA WING) BHOPAL	OCB CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 1/3
Branch	PRODUCTION ENGINEERING	Semester	THIRD

Course Code	301	Course Name	MATERIAL TECHNOLOGY
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Course Outcome 1	Understand Crystal structures and Bonds	Teach Hrs	Mar ks
Learning Outcome 1	To know about Engineering Material and properties.	5	5
CONTENT	Engineering Materials, Classification and their Properties.		
Method of Assessment	Paper pen test		
Learning Outcome 2	To Identify Crystal Structures	8	8
CONTENT	Unit cell and space lattice: Crystal system: The seven basic crystal systems; Crystal structure for metallic elements: BCC, FCC and HCP; Coordination number for Simple Cubic, BCC and FCC; Atomic radius: definition, atomic radius for Simple Cubic, BCC and FCC; Atomic Packing Factor for Simple Cubic, BCC, FCC and HCP; Simple problems on finding number of atoms for a unit cell.		
Method of Assessment	Paper pen test/ Laboratory assessment		
Learning Outcome 3	To know about Bonds in solids.	7	7
CONTENT	Classification - primary or chemical bond, secondary or molecular bond; Types of primary bonds: Ionic, Covalent and Metallic Bonds; Types of secondary bonds: Dispersion bond, Dipole bond and Hydrogen bond.		
Method of Assessment	Paper pen test/ Laboratory assessment		
Course Outcome 2	Understand Phase diagrams, Ferrous metals and its Alloys.		
Learning Outcome 1	To draw Iron Carbon binary diagram.	5	5
CONTENT	Isomorphs, eutectic and eutectoid systems; Iron-Carbon binary diagram; Iron and Carbon Steels; flow sheet for production of iron and steel		
Method of Assessment	Paper pen test		
Learning Outcome 2	To know about classification and composition of ferrous metals	8	8
CONTENT	Iron ores – Pig iron: classification, composition and effects of impurities on iron; Cast Iron: classification, composition, properties and uses; Wrought Iron: properties, uses/applications of wrought Iron; comparison of cast iron, wrought iron and mild steel and high carbon steel; standard commercial grades of steel as per BIS and AISI		
Method of Assessment	Paper pen test/ Laboratory assessment		
Learning Outcome 3	To know purpose and effect of alloying element in metals	7	7
CONTENT	Alloy Steels – purpose of alloying; effects of alloying elements – Important alloy steels: Silicon steel, High Speed Steel (HSS), heat resisting steel, spring steel, Stainless Steel (SS): types of SS, applications of SS – magnet steel – composition, properties and uses.		
Method of Assessment	Paper pen test		
Course Outcome 3	Understand Non-ferrous metals and its Alloys.		
Learning Outcome 1	To know about properties and uses of non ferrous metals	10	10

CONTENT	Properties and uses of Aluminium, copper, tin, lead, zinc, magnesium and nickel.		
Method of Assessment	Paper pen test/Laboratory assessment		
Learning Outcome 2	To identify composition, properties and uses non ferrous metal alloys	10	10
CONTENT	Copper alloys: Brasses, bronzes composition, properties and uses; Aluminium alloys: Duralumin, hinalium, magnelium – composition, properties and uses; Nickel alloys: Inconel, monel, nicPerome – composition, properties and uses. Anti-friction/Bearing alloys: Various types of bearing bronzes - Standard commercial grades as per BIS/ASME.		
Method of Assessment	Paper pen test		
Course Outcome 4	Understand Failure analysis & Testing of Materials.		
Learning Outcome 1	To Identify and perform failure analysis of Material.	10	10
CONTENT	Introduction to failure analysis; Fracture: ductile fracture, brittle fracture; cleavage; notch sensitivity; fatigue; endurance limit; characteristics of fatigue fracture; variables affecting fatigue life; creep; creep curve; creep fracture		
Method of Assessment	Paper pen test/Laboratory assessment		
Learning Outcome 2	To know about destructive and non-destructive testing.	10	10
CONTENT	Destructive testing: Tensile testing; compression testing; Hardness testing: Brinell, Rockwell; bend test; torsion test; fatigue test; creep test. Non-destructive testing: Visual Inspection; magnetic particle inspection; liquid penetrant test; ultrasonic inspection; radiography		
Method of Assessment	Paper pen test/Laboratory assessment		
Course Outcome 5	Understand Corrosion & Surface Engineering.		
Learning Outcome 1	To Know about nature and causes of corrosion.	5	5
CONTENT	Nature of corrosion and its causes; Electrochemical reactions; Electrolytes.		
Method of Assessment	Paper pen test		
Learning Outcome 2	To know about factors affecting and how to control Corrosion	5	5
CONTENT	Factors affecting corrosion: Environment, Material properties and physical conditions; Types of corrosion; Corrosion control: Material selection, environment control and design		
Method of Assessment	Paper pen test		
Learning Outcome 3	Able to use surface engineering process: Coatings and surface treatments to prevent corrosion	10	10
CONTENT	Surface engineering processes: Coatings and surface treatments; Cleaning and mechanical finishing of surfaces; Organic coatings; Electroplating and Special metallic plating; Electro polishing and photo-etching;– Conversion coatings: Oxide, phosphate and chromate coatings; Thin film coatings: PVD and CVD; Surface analysis; Hard-facing, thermal spraying and high-energy processes; Process/material selection. Pollution norms for treating effluents as per standards.		
Method of Assessment	Paper pen test/Laboratory assessment		

CO1:LO1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 01	LO Code 01	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Crystal structures and Bonds
LO Description	To know about Engineering Material and properties.
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Prac t. /Tut Hrs.	LRs Required	Re marks
1	Engineering Materials, Classification and their Properties.	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students explain Knowledge about Engineering Material and properties.	5	-	Handout, Book	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	For the given learning content, Students write answer of questions.	5	Progressive Test paper/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

CO1:LO2

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 01	LO Code 02	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Crystal structures and Bonds
LO Description	Able To Identify Crystal Structures
SCHEME OF STUDY	

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Unit cell and space lattice: Crystal system: The seven basic crystal systems; Crystal structure for metallic elements: BCC, FCC and HCP; Coordination number for Simple Cubic, BCC and FCC; Atomic radius: definition, atomic radius for Simple Cubic, BCC and FCC; Atomic Packing Factor for Simple Cubic, BCC, FCC and HCP; Simple problems on finding number of atoms for a unit cell.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Conduct quiz and Students will visit Laboratory so that students able to Identify Crystal Structures.	4	4	Handout, Book, Laboratory	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test/Laboratory assessment	For the given learning content, Students write answer of questions, and face Practical Viva	8	Practical file/ End semester exam	Internal /External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

List of Practical :Study of crystal structures.

CO1:LO3

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 01	LO Code 03	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Crystal structures and Bonds
LO Description	To know about Bonds in solids.
SCHEME OF STUDY	

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Classification - primary or chemical bond, secondary or molecular bond; Types of primary bonds: Ionic, Covalent and Metallic Bonds; Types of secondary bonds: Dispersion bond, Dipole bond and Hydrogen bond.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Conduct progressive test and Students will visit Laboratory so that students know about Bonds in solids.	4	3	Handout, Book, Laboratory	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test/Laboratory assessment	For the given learning content, Students write answer of questions, and face Practical Viva	7	Practical file/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

List of Practical :Study of atomic bonds.

CO2:LO1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 02	LO Code 01	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Phase diagrams, Ferrous metals and its Alloys.
LO Description	To draw Iron Carbon binary diagram.
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach H Hrs.	Pract. /Tut Hrs.	LRs Required	Re marks
1	Isomorphs, eutectic and eutectoid systems; Iron-Carbon binary diagram; Iron and Carbon Steels; flow sheet for production of iron and steel	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students draw Iron Carbon binary diagram.	5	-	Handout, Book	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	For the given learning content, Students write answer of questions.	5	Progressive Test paper/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

CO2:LO2

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 02	LO Code 02	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Phase diagrams, Ferrous metals and its Alloys.
LO Description	To know about classification and composition of ferrous metals
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Prac t. /Tut Hrs.	LRs Required	Re ma rks
1	Iron ores – Pig iron: classification, composition and effects of impurities on iron; Cast Iron: classification, composition, properties and uses; Wrought Iron: properties, uses/applications of wrought Iron; comparison of cast iron, wrought iron and mild steel and high carbon steel; standard commercial grades of steel as per BIS and AISI	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Conduct progressive test Students will visit Laboratory so that students know about classification and composition of ferrous metals	4	4	Handout, Book, Laboratory	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximu m Marks	Resources Required	External / Internal
1	Paper pen test/Laborator y assessment	For the given learning content, Students write answer of questions, and face Practical Viva	8	Practical file/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

List of Practicals:

1. Study and use of metallurgical microscope.
2. Prepare a specimen and examine the micro-structure of the Ferrous metals using the Metallurgical Microscope.

CO2:LO3

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 02	LO Code 03	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Phase diagrams, Ferrous metals and its Alloys.
LO Description	To know purpose and effect of alloying element in metals
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Prac t. /Tut Hrs.	LRs Required	Re marks
1	Alloy Steels – purpose of alloying; effects of alloying elements – Important alloy steels: Silicon steel, High Speed Steel (HSS), heat resisting steel, spring steel, Stainless Steel (SS): types of SS, applications of SS – magnet steel – composition, properties and uses.	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students know purpose and effect of alloying element in metals	7	-	Handout, Book	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	For the given learning content, Students write answer of questions.	7	Progressive Test paper/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

CO3:LO1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 03	LO Code 01	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Non-ferrous metals and its Alloys.
LO Description	To know about properties and uses of non ferrous metals
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Prac t. /Tut Hrs.	LRs Required	Re marks
1	Properties and uses of Aluminium, copper, tin, lead, zinc, magnesium and nickel.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Conduct progressive test and Students will visit Laboratory so that students know about properties and uses of non ferrous metals	4	6	Handout, Book, Laboratory	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test/Laboratory assessment	For the given learning content, Students write answer of questions, and face Practical Viva	10	Practical file/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

List of practical:

1. Prepare a specimen and examine the micro-structure of the Non-ferrous metals using the Metallurgical Microscope.

CO3:LO2

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 03	LO Code 02	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Non-ferrous metals and its Alloys.
LO Description	To identify composition, properties and uses non ferrous metal alloys
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Prac t. /Tut Hrs.	LRs Required	Re ma rks
1	Copper alloys: Brasses, bronzes composition, properties and uses; Aluminium alloys: Duralumin, hindalium, magnelium – composition, properties and uses; Nickel alloys: Inconel, monel, nicPerome – composition, properties and uses. Anti-friction/Bearing alloys: Various types of bearing bronzes - Standard commercial grades as per BIS/ASME.	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test or quiz and give Assignment so that students identify composition, properties and uses non ferrous metal alloys	10	-	Handout, Book	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximu m Marks	Resources Required	External / Internal
1	Paper pen test	For the given learning content, Students write answer of questions.	10	Progressive Test paper/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

CO4:LO1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 04	LO Code 01	Format No. 4
COURSE NAME	MATERIAL TECHNOLOGY					
CO Description	Understand Failure analysis & Testing of Materials.					
LO Description	To Identify and perform failure analysis of Material.					
SCHEME OF STUDY						

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teac h Hrs.	Prac t. /Tut Hrs.	LRs Required	Re marks
1	Introduction to failure analysis; Fracture: ductile fracture; brittle fracture; cleavage; notch sensitivity; fatigue; endurance limit; characteristics of fatigue fracture; variables affecting fatigue life; creep; creep curve; creep fracture.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students Identify and perform failure analysis of Material.	4	6	Handout, Book, Laborato ry	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximu m Marks	Resources Required	External / Internal
1	Paper pen test/Laborator y assessment	For the given learning content, Students write answer of questions, and face Practical Viva	10	Practical file/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

List of practical

1. Study of Universal Testing Machine.
2. Finding Young's Modulus of Elasticity, yield points, percentage elongation and percentage reduction in area, stress strain diagram plotting, tests on mild steel.
3. Finding the resistance of materials to impact loads by Izod test and Charpy test.

CO4:LO2

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 04	LO Code 02	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Failure analysis & Testing of Materials.
LO Description	To know about destructive and non-destructive testing.
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Prac t. /Tut Hrs.	LRs Required	Re marks
1	Destructive testing: Tensile testing; compression testing; Hardness testing: Brinell, Rockwell; bend test; torsion test; fatigue test; creep test. Non-destructive testing: Visual Inspection; magnetic particle inspection; liquid penetrant test; ultrasonic inspection; radiography	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students know about destructive and non-destructive testing.	4	6	Handout, Book, Laboratory	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test/Laboratory assessment	For the given learning content, Students write answer of questions, and face Practical Viva	10	Practical file/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

List of practical

1. Detect the cracks in the specimen using (i) Visual inspection and ring test (ii) Die penetration test (iii) Magnetic particle test.
2. Determination of Rockwell's Hardness Number for various materials like mild steel, high carbon steel, brass, copper and aluminium.

CO5:LO1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 05	LO Code 01	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Corrosion & Surface Engineering.
LO Description	To Know about nature and causes of corrosion.
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Nature of corrosion and its causes; Electrochemical reactions; Electrolytes.	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students Know about nature and causes of corrosion.	5	-	Handout, Book	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	For the given learning content, Students write answer of questions.	5	Progressive Test paper/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

CO5:LO2

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 05	LO Code 02	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Corrosion & Surface Engineering.
LO Description	To know about factors affecting and how to control Corrosion
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Factors affecting corrosion: Environment, Material properties and physical conditions; Types of corrosion; Corrosion control: Material selection, environment control and design	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students know about factors affecting and how to control Corrosion	5	-	Handout, Book	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	For the given learning content, Students write answer of questions.	5	Progressive Test paper/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

CO5:LO3

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 301	CO Code 05	LO Code 03	Format No. 4
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COURSE NAME	MATERIAL TECHNOLOGY
CO Description	Understand Corrosion & Surface Engineering.
LO Description	Able to use surface engineering process: Coatings and surface treatments to prevent corrosion
SCHEME OF STUDY	

S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Prac t. /Tut Hrs.	LRs Required	Re marks
1	Surface engineering processes: Coatings and surface treatments; Cleaning and mechanical finishing of surfaces; Organic coatings; Electroplating and Special metallic plating; Electro polishing and photo-etching;– Conversion coatings: Oxide, phosphate and chromate coatings; Thin film coatings: PVD and CVD; Surface analysis; Hard-facing, thermal spraying and high-energy processes; Process/material selection. Pollution norms for treating effluents as per standards.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Conduct progressive test and Students will visit Laboratory so that students Able to use surface engineering process: Coatings and surface treatments to prevent corrosion	6	4	Handout, Book, Laboratory	
SCHEME OF ASSESSMENT							

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test/Laboratory assessment	For the given learning content, Students write answer of questions, and face Practical Viva	10	Practical file/ End semester exam	Internal /External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

List of Practical

Study of types of corrosion and types of coating, surface treatment methods for prevention of corrosion.

Reference Books:

A Text Book of Material Science & Metallurgy – O.P. Khanna, Dhanpath Rai and Sons, New Delhi, 2003.

Material Science & Engineering – R.K. Rajput, S.K. Kataria & Sons, New Delhi, 2004.

Material Science – R.S. Khurmi, S. Chand & Co. Ltd., New Delhi, 2005.

Materials Science by B.S. Narang (Pub. CBS pub. & Distributions New Delhi)

Material Science and Process. by S. K. Hazra Choudhry

RGPV (DIPLOMA WING) BHOPAL		OCB CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/3
Branch	PRODUCTION ENGINEERING		Semester	THIRD	
Course Code	302	Course Name	FOUNDRY AND WELDING TECHNOLOGY		
Course Outcome 1	Demonstrate understanding of casting process			Teach Hrs	Mark s
Learning Outcome 1	To explain patterns, cores, types of patterns and pattern allowances			10	10
CONTENT	Patterns: Definition – Types of pattern – solid piece – split piece – loose piece – match plate – sweep-skeleton – segmental – cope and drag – Pattern materials – Pattern allowances, Pattern making tools. Cores: core & core prints, Color coding for patterns & core prints				
Method of Assessment	Paper pen test/ Practical assessment				
Learning Outcome 2	To explain moulds, moulding sands and moulding techniques			10	10
CONTENT	Moulding sand – constituents – types – properties of moulding sand – moulding sand preparation – moulding tools – moulding boxes – Types of moulds – green sand mould – dry sand mould – methods of moulding				
Method of Assessment	Paper pen test/ Practical assessment				
Learning Outcome 3	To know about casting processes			10	10
CONTENT	Shell mould casting – Investment casting – Pressure die casting – Hot chamber die casting – Cold chamber die casting – Gravity die casting – Centrifugal casting – Continuous casting				
Method of Assessment	Paper pen test				
Learning Outcome 4	To know about melting furnaces			05	05
CONTENT	Blast furnace – Cupola furnace – Crucible furnace types – Pit furnace Coke fired – Oil fired – Electric furnace – types – Direct arc – Indirect arc – Induction furnace –working principles.				
Method of Assessment	Paper pen test				
Course Outcome 2	Illustrate principles of joining processes				
Learning Outcome 1	To know joining processes and able to differentiate between welding, soldering and brazing			06	06
CONTENT	Fastening – Soldering – Brazing – welding – Difference between welding, soldering and brazing				
Method of Assessment	Paper pen test				
Learning Outcome 2	To know about welding, classification of welding and weldability			06	06
CONTENT	Welding, Classification of welding process -- Weldability of metals- Welding electrodes – Preweld and postweld treatment –Types of welded joints				
Method of Assessment	Paper pen test/ Practical assessment				

Learning Outcome 3	To explain about safety during welding	04	04
CONTENT	Safety in welding: personal safety and equipment safety		
Method of Assessment	Paper pen test/ Practical assessment		
Course Outcome 3	Demonstrate applications of various types of welding processes		
Learning Outcome 1	To know the principle and types of arc welding	10	10
CONTENT	Arc Welding: Definition – arc welding equipment – electrode types – filler and flux materials – arc welding methods – Metal arc – Metal Inert gas (MIG) – Tungsten inert gas (TIG) – Submerged arc – Resistance welding – Spot welding – Plasma arc welding		
Method of Assessment	Paper pen test/ Practical assessment		
Learning Outcome 2	To know the principle and working of advanced welding processes	06	06
CONTENT	Thermit welding – Electron beam welding – Laser beam welding – Ultrasonic welding – working principle – applications		
Method of Assessment	Paper pen test		
Learning Outcome 3	To explain gas welding process	08	08
CONTENT	Gas welding: Oxy-acetylene welding – gas welding equipment – three types of flames – welding techniques – filler rods. – flame cutting		
Method of Assessment	Paper pen test/ Practical assessment		
Course Outcome 4	Explain the causes and remedies of defects in castings		
Learning Outcome 1	To know about the possible defects in castings	10	10
CONTENT	Defects in casting – causes and remedies		
Method of Assessment	Paper pen test		
Learning Outcome 2	To know about inspection and testing of castings	05	05
CONTENT	Inspection and testing of castings – destructive and non-destructive types of tests – magnetic particle test – radiographic and ultrasonic test.		

Method of Assessment	Paper pen test		
Course Outcome 5	Explain the causes and remedies of defects in welded joints		
Learning Outcome 1	To know about the possible defects in welded joints	05	05
CONTENT	Defects in welded joints – causes and remedies		
Method of Assessment	Paper pen test		
Learning Outcome 2	To know about inspection and testing of welded joints	05	05
CONTENT	Inspection and testing of welded joints – destructive and non-destructive types of tests – magnetic particle test – radiographic and ultrasonic test.		
Method of Assessment	Paper pen test		

CO1:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 01	LO Code 01	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Demonstrate understanding of casting process						
LO Description		To explain patterns, cores, types of patterns and pattern allowances						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Patterns: Definition – Types of pattern – solid piece – split piece – loose piece – match plate – sweep- skeleton – segmental – cope and drag – Pattern materials – Pattern allowances, Pattern making tools. Cores: core & core prints, Color coding for patterns & core prints	Traditional Lecture method + Practical (Foundry Shop)	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment. Also students will do practical to gain Knowledge of patterns, types of patterns, pattern allowances and cores	6	4	Handout, Book, Foundry Shop		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test/ Practical assessment	For the given learning content, Students write answer of questions and face Practical Viva	10	Progressive test/ End semester exam/ Practical file	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practical given common with LO2								

CO1:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 302	CO Code 01	LO Code 02	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY					
CO Description		Demonstrate understanding of casting process					
LO Description		To explain moulds, moulding sands and moulding techniques					
SCHEME OF STUDY							
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rks
1	Moulding sand – constituents – types – properties of moulding sand – moulding sand preparation – moulding tools – moulding boxes – Types of moulds – green sand mould – dry sand mould – methods of moulding	Traditional Lecture method + Practical (Foundry Shop)	Teacher will explain the content.. Teacher will conduct Progressive test/quiz so that students explain moulds, moulding sand, properties of moulding sand, types of moulds and moulding methods	6	4	Handout, Book, Foundry Shop	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test/ Practical assesment	For the given learning content, Students write answer of questions and face Practical Viva	10	Progressive test/ End semester exam/ Practical file	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							
List of Practical (LO1 and LO2)							
Prepare the green sand mould using the following: <ul style="list-style-type: none"> • Solid Pattern <ol style="list-style-type: none"> 1. Stepped pulley/ Bearing top • Split Pattern <ol style="list-style-type: none"> 2. Bent Pipe/ T-pipe with core print 3. Dumble • Loose Piece Pattern <ol style="list-style-type: none"> 4. Dovetail • Core Preparation <ol style="list-style-type: none"> 5. Core preparation for Bent pipe/ T-pipe 							

CO1:LO3

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 01	LO Code 03	Format No. 4
COURSE NAME		FURNITURE AND WELDING TECHNOLOGY						
CO Description		Demonstrate understanding of casting process						
LO Description		To know about casting 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	Shell mould casting – Investment casting – Pressure die casting – Hot chamber die casting – Cold chamber die casting – Gravity die casting – Centrifugal casting – Continuous casting	Traditional Teaching Lecture method + Assignment	Teacher will explain the content to students. Teacher will conduct Progressive test/give assignment so that students will know about different types of casting processes.	10	-	Handout, Book		
SCHEME OF ASSESSMENT								
S.No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	10	Progressive Test paper/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO1:LO4

GPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME			Branch Code P05	Course Code 302	CO Code 01	LO Code 04	Format No. 4
COURSE NAME		FURNDRY AND WELDING TECHNOLOGY						
CO Description		Demonstrate understanding of casting process						
LO Description		To know about melting furnaces						
SCHEME OF STUDY								
S No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	blast furnace – Cupola furnace – Crucible furnace types – Pit furnace – Coke fired – Oil fired – Electric furnace – types – Direct arc – Indirect arc – Induction furnace – working principles.	Traditional Te Lecture method + Assignment	acher will explain the content to students. Teacher will conduct Progressive test/give assignment so that students will know about different metal melting furnaces.	05	-	Handout, Book		
SCHEME OF ASSESSMENT								
S.No	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions.		05	Progressive Test paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO2:LO1 RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 302	CO Code 02	LO Code 01	Format No. 4
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COURSE NAME: FOUNDRY AND WELDING TECHNOLOGY

O Description: **Illustrate principles of welding processes.**

O Description: To know joining processes and able to differentiate between welding, soldering and brazing

SCHEME OF STUDY

Sr.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
	Fastening – Soldering Brazing – welding Difference between welding, soldering and brazing	Traditional Teaching method + assignment	Teacher will explain the contents and provide handout to students. Teacher will conduct Progressive test/assignment so that students know joining processes and difference between welding, brazing and soldering	6	-	Handout, Book	

SCHEME OF ASSESSMENT

Sr.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper pen test	For the given learning content, Students write answer of questions.	6	Progressive Test paper/ End semester exam	Internal /External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

CO2:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 02	LO Code 02	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Illustrate principles of welding processes.						
LO Description		To know about welding, classification of welding and weldability						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Welding, Classification of welding process — Weldability of metals– Welding electrodes – Preweld and postweld treatment –Types of welded joints	Traditional Lecture method + Assignment	Teacher will explain the contents to students. Teacher will conduct Progressive test/quiz so that students know about welding, classification of welding and weldability	6	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	6	Progressive Test paper/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO2:LO3

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 02	LO Code 03	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Illustrate principles of welding processes.						
LO Description		To explain about safety during welding						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Safety in welding: personal safety and equipment safety	Traditional Lecture method + Practical (Welding Shop)	Teacher will explain the safety measures during welding to students. The students will learn about safety during welding while working in welding shop.	2	2	Handout, Book, Welding Shop		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test /Practical assessment	For the given learning content, Students write answer of questions and face Practical Viva	4	Practical file/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
Student will learn about safety during Practical in Welding Shop								

CO3:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 302	CO Code 03	LO Code 01	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY					
CO Description		Demonstrate applications of various types of welding processes.					
LO Description		To know the principle and types of arc welding					
SCHEME OF STUDY							
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rks
1	Arc Welding: Definition – arc welding equipment – electrode types – filler and flux materials – arc welding methods – Metal arc – Metal Inert gas (MIG) – Tungsten inert gas (TIG) - Submerged arc – Resistance welding – Spot welding – Plasma arc welding	Traditional Lecture method + Practical (Welding Shop)	Teacher will explain the contents to students. Students will do practical in welding shop to understand arc welding techniques	6	4	Handout, Book, Welding Shop	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test / Practical assessment	For the given learning content, Students write answer of questions and face Practical Viva	10	Practical file/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							
List of Practical							
Make the following welding joint: <ul style="list-style-type: none"> • Arc welding (Raw Material: 25 mmx6mm MS flat) <ol style="list-style-type: none"> 1. Lap joint 2. Butt joint 3. T-joint 							

CO3:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 03	LO Code 02	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Demonstrate applications of various types of welding processes.						
LO Description		To know the principle and working of advanced welding 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	Thermit welding – Electron beam welding – Laser beam welding – Ultrasonic welding – working principle – applications	Traditional Lecture method + Assignmen t + Quiz	Teacher will explain the contents to students. Students will learn about working and applications of advanced welding processes	6	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions,	6	Assignment/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO3:LO3

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 03	LO Code 03	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Demonstrate applications of various types of welding processes.						
LO Description		To explain gas welding process						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Gas welding: Oxy-acetylen welding – gas welding equipment –three types flames – welding techniques filler rods. – flame cutting	Traditional Lecture method + Practical (Welding Shop)	Teacher will explain the contents to students. Students will visit Laboratory so that students explain about refrigeration and calculate COP	4	4	Handout, Book, Welding Shop		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test /Practical assessment	For the given learning content, Students write answer of questions and face Practical Viva	8	Practical file/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practicals								
Make the following welding joint/cutting:								
<ul style="list-style-type: none"> • Gas Welding (Raw Material: 25mmx3mm MS flat) <ol style="list-style-type: none"> 1. Lap joint 2. Butt joint • Gas cutting: (GI/MS Sheet-3mm thickness) <ol style="list-style-type: none"> 3. Profile cutting–circular profile 								

CO4:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 04	LO Code 01	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Explain the causes and remedies of defects in castings.						
LO Description		To know about the possible defects in castings						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Defects in casting – causes and remedies	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students know about possible defects in casting along with their causes and remedies	10	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions.		10	Progressive Test paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO4:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 04	LO Code 02	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Explain the causes and remedies of defects in castings.						
LO Description		To know about inspection and testing of castings						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Inspection and testing of castings – destructive and non-destructive types of tests – magnetic particle test – radiographic and ultrasonic test.	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students know about inspection and testing of castings	5	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	5	Progressive Test paper/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO5:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 05	LO Code 01	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Explain the causes and remedies of defects in welded joints.						
LO Description		To know about the possible defects in welded joints						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Defects in welded joints – causes and remedies	Traditional Lecture method	Teacher will explain the contentsto students so that students know about the possible defects in welded joints along with their causes and remedies	5	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	5	Progressive Test paper/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO5:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 302	CO Code 05	LO Code 02	Format No. 4
COURSE NAME		FOUNDRY AND WELDING TECHNOLOGY						
CO Description		Explain the causes and remedies of defects in welded joints.						
LO Description		To know about inspection and testing of welded joints						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Inspection and testing of welded joints – destructive and non-destructive types of tests – magnetic particle test – radiographic and ultrasonic test.	Traditional Lecture method	Teacher will explain the contents to students so that students know about testing and inspection of welded joints.	5	-	Handout, Book, Laboratory		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	5	Progressive Test paper/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

Reference Books:

1. Elements of Workshop Technology Volume I & II, Hajra Choudhary & Bhattacharaya, Media Promoters, 11th Edition, 2007
2. Introduction of Basic Manufacturing Processes and Workshop Technology, Rajender Singh, New age International (P) Ltd. New Delhi- 110002, 2006
3. Manufacturing Process Begeman, Tata McGraw Hill, New Delhi.
4. Workshop Technology- Volume I, II, & III, WJ Chapman Viva Books Pvt. Ltd., New Delhi
5. Welding Technology By O. P. Khanna
6. Foundry Technology By O. P. Khanna
7. Production Technology By R. K. Jain
8. Workshop Technology By Raghuwanshi
9. Production Technology by P.C. Sharma, S Chand
10. Process and Materials of Manufacture By Lindberg, PHI

RGPV (DIPLOMA WING) BHOPAL		OCB CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 1/3
Branch	PRODUCTION ENGINEERING		Semester	THIRD	
Course Code	303	Course Name	BASIC MECHANICAL ENGINEERING		
Course Outcome 1	Understand basics of thermodynamics			Teach Hrs	Mark s
Learning Outcome 1	To explain types of System, State, Process and Cycles.			7	7
CONTENT	Role of Thermodynamics in Engineering and Science, Types of Systems, Thermodynamic Equilibrium, Properties, State, Process and Cycle				
Method of Assessment	Paper pen test				
Learning Outcome 2	To describe Law of Thermodynamics			5	5
CONTENT	Introduction to Zeroth, First and Second laws of thermodynamics				
Method of Assessment	Paper pen test				
Learning Outcome 3	To know about non-flow and flow processes and draw T-S and P-V Diagrams.			8	8
CONTENT	Heat and Work Interactions for various non-flow and flow processes; Kelvin-Planck and Clausius Statements, Carnot Cycle, Carnot Efficiency, T-S and P-V Diagrams, Concept of Entropy (Definition only).				
Method of Assessment	Paper pen test				
Course Outcome 2	Understand basics of Heat transfer, Components & Mechanism of thermal power plant.				
Learning Outcome 1	To explain conduction, convection and radiation			7	7
CONTENT	Modes of Heat Transfer; Conduction: Composite Walls and Cylinders, Combined Conduction and Convection: Overall Heat Transfer Co-efficient, and Radiation				
Method of Assessment	Paper pen test				
Learning Outcome 2	To draw layout of thermal power Plant			5	5
CONTENT	Thermal Power Plant Layout; Rankine Cycle				
Method of Assessment	Paper pen test				

Learning Outcome 3	To explain about boiler operations	8	8
CONTENT	Classification of boilers, Simple vertical boiler, Lancashire boiler, Babcock and Wilcox boiler and Locomotive boiler.		
Method of Assessment	Paper pen test/Laboratory assessment		
Course Outcome 3	Understand basics of Steam turbine, Internal Combustion Engines and Refrigeration		
Learning Outcome 1	To know about working of steam turbine, condenser and cooling tower	7	7
CONTENT	Impulse and Reaction Turbines; Condensers: Jet & Surface Condensers, Cooling Towers		
Method of Assessment	Paper pen test/Laboratory assessment		
Learning Outcome 2	To identify the physical differences between S.I. and C.I. engines and 2-S and 4-S engines	8	8
CONTENT	IC engines :Define Heat Engine, Classification of I.C. Engines, working of two strokes and four stroke petrol and diesel engine with line diagram; Indicated Horse Power, Brake Horse Power, Mechanical Efficiency		
Method of Assessment	Paper pen test/Laboratory assessment		
Learning Outcome 3	To explain about refrigeration and calculate COP	5	5
CONTENT	Refrigeration: Concept of Heat Pump and Refrigeration, ERP/COP and Ton of Refrigeration.		
Method of Assessment	Paper pen test/Laboratory assessment		
Course Outcome 4	Understand Fluid properties, Fluid statics and Fluid kinematics		
Learning Outcome 1	To know about different Fluid Properties.	8	8
CONTENT	Properties of fluid, Newton's law of viscosity, kinematic viscosity, dynamic viscosity, simple numerical examples.		
Method of Assessment	Paper pen test		
Learning Outcome 2	To know about pressure measuring devices and measure of pressure, velocity of fluid flow	12	12
CONTENT	Fluid statics: Laws of fluid statics, atmospheric and absolute pressure, types of pressure measuring devices, numerical problems on manometers. Fluid kinematics: Concept of control volume, types of fluid flow, Continuity equation, momentum equations & its application in impact of jet; One dimensional fluid flow, simple numerical examples.		

Method of Assessment	Paper pen test		
Course Outcome 5	Understand Fluid dynamics, Flow measurement and Flow through pipes.		
Learning Outcome 1	To explain equations of fluid flow and know limitation and assumptions	5	5
CONTENT	Euler's equation, Bernoulli's equation; concept and definition, limitations and assumptions, applications.		
Method of Assessment	Paper pen test/Laboratory assessment		
Learning Outcome 2	To identify flow measuring devices and know how to measure flow	10	10
CONTENT	Flow measurement; Flow measuring devices- classification and applications; Pitot tube, venturi-meter, rotameter, Orifice and notch and simple numerical problem.		
Method of Assessment	Paper pen test/Laboratory assessment		
Learning Outcome 3	To know about flow in pipes and calculate losses during flow	5	5
CONTENT	Flow through pipes; Introduction to pipe flow, Reynolds's number, friction loss in pipe, friction factor, Darcy's equation, water hammer effect.		
Method of Assessment	Paper pen test/Laboratory assessment		

CO1:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 01	LO Code 01	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand basics of thermodynamics						
LO Description		To explain types of System, State, Process and Cycles.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Role of Thermodynamics in Engineering and Science, Types of Systems, Thermodynamic Equilibrium, Properties, State, Process and Cycle	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students explain Knowledge of thermodynamic system, State, Process and cycle.	7	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	7	Progressive Test paper/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO1:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 01	LO Code 02	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand basics of thermodynamics						
LO Description		To describe Law of Thermodynamics						
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 Zeroth, First and Second laws of thermodynamics	Traditional Lecture method	Teacher will explain the content.. Teacher will conduct Progressive test/quiz so that students describe Law of Thermodynamics	5	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	5	Progressive Test paper/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO1:LO3

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 303	CO Code 01	LO Code 03	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING					
CO Description		Understand basics of thermodynamics					
LO Description		To know about non-flow and flow processes and draw T-S and P-V Diagrams					
SCHEME OF STUDY							
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rks
1	Heat and Work Interactions for various non-flow and flow processes; Kelvin-Planck and Clausius Statements, Carnot Cycle, Carnot Efficiency, T-S and P-V Diagrams, Concept of Entropy (Definition only)	Traditional Lecture method + Quiz	Teacher will explain the content to students. Teacher will conduct Progressive test/give assignment so that students know about non-flow and flow processes and draw T-S and P-V Diagrams	8	-	Handout, Book	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions.	8	Progressive Test paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							

CO2:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 02	LO Code 01	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand basics of Heat transfer, Components & Mechanism of thermal power plant.						
LO Description		To explain conduction, convection and radiation						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Modes of Heat Transfer; Conduction: Composite Walls and Cylinders, Combined Conduction and Convection: Overall Heat Transfer Co-efficient, and Radiation	Traditional Lecture method + assignment	Teacher will explain the contents and provide handout to students. Teacher will conduct Progressive test/assignment so that students explain concept of conduction, convection and radiation	7	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions.		7	Progressive Test paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO2:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 02	LO Code 02	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand basics of Heat transfer, Components & Mechanism of thermal power plant.						
LO Description		To draw layout of thermal power 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	Thermal Power Plant Layout; Rankine Cycle	Traditional Lecture method	Teacher will explain the contents to students. Teacher will conduct Progressive test/quiz so that students draw layout of thermal power Plant	5	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions.		5	Progressive Test paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO2:LO3

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 02	LO Code 03	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand basics of Heat transfer, Components & Mechanism of thermal power plant.						
LO Description		To explain about boiler operations.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Classification of boilers, Simple vertical boiler, Lancashire boiler, Babcock and Wilcox boiler and Locomotive boiler.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students explain about boiler operations.	4	4	Handout, Book, Laboratory		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test /Laboratory assessment	For the given learning content, Students write answer of questions and face Practical Viva	8	Practical file/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practical								
<ul style="list-style-type: none"> • Study of high-pressure boiler. • Study of boiler mountings and Accessories. 								

CO3:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 03	LO Code 01	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand basics of Steam turbine, Internal Combustion Engines and Refrigeration						
LO Description		To know about working of steam turbine, condenser and cooling tower						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Impulse and Reaction Turbines; Condensers: Jet & Surface Condensers, Cooling Towers	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students know about working of steam turbine, condenser and cooling tower	3	4	Handout, Book, Laboratory		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test /Laboratory assessment	For the given learning content, Students write answer of questions and face Practical Viva	7	Practical file/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practical								
1. Study of Steam Turbines								

CO3:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 03	LO Code 02	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand basics of Steam turbine, Internal Combustion Engines and Refrigeration						
LO Description		To identify the physical differences between S.I. and C.I. engines and 2-S and 4-S engines						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rks	
1	IC engines :Define Heat Engine, Classification of I.C. Engines, working of two strokes and four stroke petrol and diesel engine with line diagram; Indicated Horse Power, Brake Horse Power, Mechanical Efficiency	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students identify the physical differences between S.I. and C.I. engines and 2-S and 4-S engines	4	4	Handout, Book, Laboratory		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test /Laboratory assessment	For the given learning content, Students write answer of questions and face Practical Viva	8	Practical file/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practicals								
<ol style="list-style-type: none"> 1. Study of two and four stroke petrol Engines. 2. Study of two and four stroke diesel Engines. 								

CO3:LO3

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 303	CO Code 03	LO Code 03	Format No. 4	
COURSE NAME	BASIC MECHANICAL ENGINEERING						
CO Description	Understand basics of Steam turbine, Internal Combustion Engines and Refrigeration						
LO Description	To explain about refrigeration and calculate COP.						
SCHEME OF STUDY							
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rks
1	Refrigeration: Concept of Heat Pump and Refrigeration, ERP/COP and Ton of Refrigeration.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students explain about refrigeration and calculate COP	3	2	Handout, Book, Laboratory	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test /Laboratory assessment	For the given learning content, Students write answer of questions and face Practical Viva	5	Practical file/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							
List of Practicals							
Determination of COP of Refrigeration System							

CO4:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 04	LO Code 01	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand Fluid properties, Fluid statics and Fluid kinematics						
LO Description		To know about different Fluid 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	Properties of fluid, Newton's law of viscosity, kinematic viscosity, dynamic viscosity, simple numerical examples.	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students know about different Fluid Properties.	8	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions and solve numerical problems.		8	Progressive Test paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO4:LO2

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 303	CO Code 04	LO Code 02	Format No. 4	
COURSE NAME	BASIC MECHANICAL ENGINEERING						
CO Description	Understand Fluid properties, Fluid statics and Fluid kinematics						
LO Description	To know about pressure measuring devices and measure of pressure, velocity of fluid flow.						
SCHEME OF STUDY							
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rks
1	Fluid statics: Laws of fluid statics, atmospheric and absolute pressure, types of pressure measuring devices, numerical problems on manometers. Fluid kinematics: Concept of control volume, types of fluid flow, Continuity equation, momentum equations & its application in impact of jet; One dimensional fluid flow, simple numerical examples.	Traditional Lecture method	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students know about pressure measuring devices and measure of pressure, velocity of fluid flow..	12	-	Handout, Book	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions and solve numerical problems.	12	Progressive Test paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							

CO5:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 05	LO Code 01	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand Fluid dynamics, Flow measurement and Flow through pipes						
LO Description		To explain equations of fluid flow and know limitation and assumptions.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Euler's equation, Bernoulli's equation; concept and definition, limitations and assumptions, applications.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students explain equations of fluid flow and know limitation and assumptions.	3	2	Handout, Book, Laboratory		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test /Laboratory assessment	For the given learning content, Students write answer of questions and face Practical Viva	5	Practical file/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practical								
Verification of Bernoulli's theorem.								

CO5:LO2

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 303	CO Code 05	LO Code 02	Format No. 4	
COURSE NAME	BASIC MECHANICAL ENGINEERING						
CO Description	Understand Fluid dynamics, Flow measurement and Flow through pipes						
LO Description	To identify flow measuring devices and know how to measure flow.						
SCHEME OF STUDY							
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rks
1	Flow measurement; Flow measuring devices-classification and applications; Pitot tube, venturi-meter, rotameter, Orifice and notch and simple numerical problem.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students identify flow measuring devices and know how to measure flow.	6	4	Handout, Book, Laboratory	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test /Laboratory assessment	For the given learning content, Students write answer of questions, solve numerical problems and face Practical Viva	10	Practical file/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							
List of Practical							
Determination of Coefficient of Discharge of Venturi-meter.							
Determination of Coefficient of Discharge, coefficient of contraction and coefficient of velocity of Orifice-meter.							

CO5:LO3

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 303	CO Code 05	LO Code 03	Format No. 4
COURSE NAME		BASIC MECHANICAL ENGINEERING						
CO Description		Understand Fluid dynamics, Flow measurement and Flow through pipes						
LO Description		To know about flow in pipes and calculate losses during flow						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Flow through pipes; Introduction to pipe flow, Reynolds's number, friction loss in pipe, friction factor, Darcy's equation, water hammer effect.	Traditional Lecture method + Practical (Lab visit)	Teacher will explain the contents to students. Students will visit Laboratory so that students know about flow in pipes and calculate losses during flow	3	2	Handout, Book, Laboratory		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required	External / Internal		
1	Paper pen test /Laboratory assessment	For the given learning content, Students write answer of questions, and face Practical Viva		5	Practical file/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practical								
Determination of coefficient of friction of flow through pipes.								

Reference Books:

- Basic Mechanical Engineering – M.P. Poonia & S.C. Sharma, Khanna Publishing House
- Elements of Mechanical Engineering – M. L. Mathur, F. S. Mehta and R. P. Tiwari, Jain Brothers, New Delhi
- Engineering Heat Transfer – Gupta & Prakash, Nem Chand & Brothers, New Delhi
- Fluid Mechanics & Hydraulic Machines, S.S. Rattan, Khanna Book Publishing Co., Delhi
- Hydraulic, fluid mechanics & fluid machines – Ramamrutham S, Dhanpath Rai and Sons, New Delhi.
- Hydraulics and fluid mechanics including Hydraulic machines – Modi P.N. and Seth S.M., Standard Book House. New Delhi
- Basic Mechanical Engineering – J Benjamin
- Elements of Mechanical Engineering – Roy and Choudhary
- Engineering Thermodynamics – Spalding and Cole

RGPV (DIPLOMA WING) BHOPAL		OCB CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 1/3
Branch	PRODUCTION ENGINEERING		Semester	THIRD	
Course Code	304	Course Name	MECHANICS OF MACHINE		
Course Outcome 1	To understand the concepts of Simple Stresses, Strain and Strain Energy			Teach Hrs	Marks
Learning Outcome 1	To understand the concept of Simple Stresses and Strain			10	10
CONTENT	Types of loads & deformation, Types of stress & strain, Hook's law, Stress- strain diagram for ferrous & non-ferrous materials, modulus of elasticity & rigidity, Bulk modulus, stresses in bars of varying cross sections, composite sections, thermal stresses & strain, thermal stresses in composite sections, Poisson's ratio, Relation between E, N & K, Related numerical problems on the above topics.				
Method of Assessment	Paper pen test				
Learning Outcome 2	To understand the concept of Strain Energy			10	10
CONTENT	Strain energy or resilience, proof resilience and modulus of resilience; Derivation of strain energy for the following cases: i) Gradually applied load, ii) Suddenly applied load, iii) Impact/ shock load; Related numerical problems.				
Method of Assessment	Paper pen test				
Course Outcome 2	To understand the concept of Shear Force & Bending Moment Diagrams, Bending Stresses in Beams				
Learning Outcome 1	To understand the concept of Shear Force and Bending Moment Diagrams			14	14
CONTENT	Types of beams with examples: a) Cantilever beam, b) Simply supported beam, c) Over hanging beam, d) Continuous beam, e) Fixed beam; Types of Loads – Point load, UDL and UVL; Definition and explanation of shear force and bending moment; Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method only for the following cases: a) Cantilever with point loads, b) Cantilever with uniformly distributed load, c) Simply supported beam with point loads, d) Simply supported beam with UDL, e) Over hanging beam with point loads, at the center and at free ends, f) Over hanging beam with UDL throughout, g) Combination of point and UDL for the above; Related numerical problems.				
Method of Assessment	Paper pen test				
Learning Outcome 2	To understand the concept of Bending Stresses in Beams			06	06
CONTENT	Theory of simple bending, Assumptions in simple bending theory, neutral axis and neutral surface, modulus of section of different section, bending stress in beams of uniform strength.				
Method of Assessment	Paper pen test				
Course Outcome 3	To understand the mechanism and various types of drives available for power transmission.				

Learning Outcome 1	To understand the mechanism and types along with their inversion.	10	10
CONTENT	Definitions- Simple mechanism, link or element, Higher & lower pair, Kinematic pair, Kinematic Chain, Mechanism, Inversion, M/c, Four bar chain, Slider crank chain, Double slider crank chain & their inversions.		
Method of Assessment	Paper pen test		
Learning Outcome 2	To understand the various types of drives available for power transmission	10	10
CONTENT	Belt, Chain, Rope, Gear drives & their comparison; Belt Drives - flat belt, V- belt & its applications; Material for flat and V-belt; Angle of lap, Belt length. Slip and Creep; Determination of Velocity Ratio, Ratio of tight side and slack side tension; Centrifugal tension and Initial tension; Condition for maximum power transmission (Simple numericals); Chain Drives – Advantages & Disadvantages; Gear Drives – Spur gear terminology; Types of gears and gear trains, their selection for different applications; Train value & Velocity ratio for compound, reverted and simple epicyclic gear train; Law of gearing; Rope Drives – Types, applications, advantages & limitations of Steel ropes.		
Method of Assessment	Paper pen test		
Course Outcome 4	To understand the different types of cams, followers and drawing of cam profile.		
Learning Outcome 1	To understand the different types of cams, followers and their motion.	6	6
CONTENT	Concept; Definition and application of Cams and Followers; Classification of Cams and Followers; Different follower motions and their displacement diagrams like uniform velocity, SHM, uniform acceleration and Retardation;		
Method of Assessment	Paper pen test		
Learning Outcome 2	To learn the method of drawing cam profile.	14	14
CONTENT	Drawing of profile of radial cam with knife-edge and roller follower with and without offset with reciprocating motion (graphical method).		
Method of Assessment	Paper pen test		
Course Outcome 5	To understand the need for balancing of masses and concept of vibration.		
Learning Outcome 1	To understand the concept, need and methods for balancing of masses.	12	12
CONTENT	Concept of balancing; Balancing of single rotating mass; Graphical method for balancing of several masses revolving in same plane; balancing of a single rotating mass by two masses in different planes.		
Method of Assessment	Paper pen test		

Learning Outcome 2	To understand the concept, terminology and causes of vibration.	8	8
CONTENT	Concept and terminology used in vibrations, types of Vibratory motion, Causes of vibrations in machines; their harmful effects and remedies.		
Method of Assessment	Paper pen test		

CO1:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 304	CO Code 01	LO Code 01	Format No.4	
COURSE NAME		MECHANICS OF MACHINE							
CO Description		To understand the concepts of Simple Stresses, Strain and Strain Energy							
LO Description		To understand the concept of Simple Stresses and Strain							
SCHEME OF STUDY									
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks		
1	Types of loads & deformation, Types of stress & strain, Hook's law, Stress- strain diagram for ferrous & non-ferrous materials, modulus of elasticity & rigidity, Bulk modulus, stresses in bars of varying cross sections, composite sections, thermal stresses & strain, thermal stresses in composite sections, Poisson's ratio, Relation between E, N & K, Related numerical problems on the above topics.	Traditional Lecture method + Assignment	Teacher will explain the contents so that students understand the concepts of types of loads, stresses, strains and stress-strain diagram. Teacher will conduct Progressive test/ give assignment.	10	-	Handout, Book			
SCHEME OF ASSESSMENT									
S. No	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.		10	Progressive test/ End semester exam	External / Internal			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)									

CO1:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 304	CO Code 01	LO Code 02	Format No.4
COURSE NAME		MECHANICS OF MACHINE						
CO Description		To understand the concepts of Simple Stresses, Strain and Strain Energy						
LO Description		To understand the concept of Strain Energy.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Strain energy or resilience, proof resilience and modulus of resilience; Derivation of strain energy for the following cases: i) Gradually applied load, ii) Suddenly applied load, iii) Impact/ shock load; Related numerical problems.	Traditional Lecture method + Assignment	Teacher will explain the content so that students can understand strain energy and its deviation for various loads. Teacher will conduct Progressive test/ give assignment.	10	-	Handout, Book,		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	10	Progressive test/ End semester exam	External / Internal			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) – NIL-								

CO2:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch C Code P05	Course C Code 304	Code 02	LO Code 01	Format No.4
COURSE NAME		MECHANICS OF MACHINE						
CO Description		To understand the concept of Shear Force & Bending Moment Diagrams, Bending Stresses in Beams						
LO Description		To understand the concept of Shear Force and Bending Moment Diagrams						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Types of beams with examples: a) Cantilever beam, b) Simply supported beam, c) Over hanging beam, d) Continuous beam, e) Fixed beam; Types of Loads – Point load, UDL and UVL; Definition and explanation of shear force and bending moment; Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method only for the following cases: a) Cantilever with point loads, b) Cantilever with uniformly distributed load, c) Simply supported beam with point loads, d) Simply supported beam with UDL, e) Over hanging beam with point loads, at the center and at free ends, f) Over hanging beam with UDL throughout, g) Combination of point and UDL for the above; Related numerical problems.	Traditional Lecture method + Assignment	Teacher will explain the contents to students so that students can understand the types of beams, loads and Shear force and Bending moment behavior for various beams. Teacher will conduct Progressive test/ give assignment.	14	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			

1	Paper pen test	For the given learning content, Students write answer of questions.	14	Progressive Test paper/ End semester exam	External / Internal
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) NIL					

CO2:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 304	CO Code 02	LO Code 02	Format No.4
COURSE NAME		MECHANICS OF MACHINE						
CO Description		To understand the concept of Shear Force & Bending Moment Diagrams, Bending Stresses in Beams						
LO Description		To understand the concept of Bending Stresses in Beams						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Theory of simple bending, Assumptions in simple bending theory, neutral axis and neutral surface, modulus of section of different section, bending stress in beams of uniform strength.	Traditional Lecture method + Assignment	Teacher will explain the contents to students so that students can understand the simple bending theory and bending stresses in beams.	6	-	Handout, Book		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	6	Progressive Test paper/ End semester exam	External / Internal			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
–NIL–								

CO3:LO1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 304	CO Code 03	LO Code 01	Format No.4	
COURSE NAME	MECHANICS OF MACHINE						
CO Description	To understand the mechanism and various types of drives available for power transmission.						
LO Description	To understand the mechanism and types along with their inversion.						
SCHEME OF STUDY							
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Definitions- Simple mechanism, link or element, Higher & lower pair, Kinematic pair, Kinematic Chain, Mechanism, Inversion, M/c, Four bar chain, Slider crank chain, Double slider crank chain & their inversions.	Traditional Lecture method+ Assignment	Teacher will explain the contents to students so that students can understand the types of mechanisms and their inversion. Teacher will conduct Progressive test/assignment.	10	-	Handout, Book	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions.	10	Progressive Test paper/ Assignment /End semester exam External / Internal	External / Internal		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) NIL							

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 304	CO Code 03	LO Code 02	Format No.4	
COURSE NAME		MECHANICS OF MACHINE							
CO Description		To understand the mechanism and various types of drives available for power transmission.							
LO Description		To understand the various types of drives available for power transmission							
SCHEME OF STUDY									
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks		
1	Belt, Chain, Rope, Gear drives & their comparison; Belt Drives - flat belt, V– belt & its applications; Material for flat and V-belt; Angle of lap, Belt length. Slip and Creep; Determination of Velocity Ratio, Ratio of tight side and slack side tension; Centrifugal tension and Initial tension; Condition for maximum power transmission (Simple numericals); Chain Drives – Advantages & Disadvantages; Gear Drives – Spur gear terminology; Types of gears and gear trains, their selection for different applications; Train value & Velocity ratio for compound, reverted and simple epicyclic gear train; Law of gearing; Rope Drives – Types, applications, advantages & limitations of Steel ropes.	Traditional Lecture method + Assignment	Teacher will explain the contents to students so that students can understand the various means of power transmission. Teacher will conduct Progressive test/ give assignment.	10	-	Handout, Book			
SCHEME OF ASSESSMENT									

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	For the given learning content, Students write answer of questions,	10	Progressive Test paper/ Assignment/ End semester exam	External / Internal
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) NIL					

CO4:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 304	CO Code 04	LO Code 01	Format No.4	
COURSE NAME		MECHANICS OF MACHINE							
CO Description		To understand the different types of cams, followers and drawing of cam profile.							
LO Description		To understand the different types of cams, followers and their motion.							
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; Definition and application of Cams and Followers; Classification of Cams and Followers; Different follower motions and their displacement diagrams like uniform velocity, SHM, uniform acceleration and Retardation;	Traditional Lecture method+ Assignment	Teacher will explain the contents so that students can understand the various types of cams and followers along with their motions. Teacher will conduct Progressive test/ give Assignment.	6	---	Handout, Book,			
SCHEME OF ASSESSMENT									
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal				
1	Paper pen test	For the given learning content, Students write answer of questions.	6	Progressive Test paper/ End semester exam	External / Internal				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) NIL									

CO4:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 304	CO Code 04	LO Code 02	Format No.4
COURSE NAME		MECHANICS OF MACHINE						
CO Description		To understand the different types of cams, followers and drawing of cam profile.						
LO Description		To learn the method of drawing cam profile.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Drawing of profile of radial cam with knife-edge and roller follower with and without offset with reciprocating motion (graphical method).	Traditional Lecture method+ assignment	Teacher will explain the contents so that the students can draw the cam profile. Teacher will conduct Progressive test/ give Assignment so that students know about the concept of drawing cam profile.	14	-	Handout, Book,		
SCHEME OF ASSESSMENT								
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal			
1	Paper pen test	For the given learning content, Students write answer of questions.	14	Progressive Test paper/ End semester exam	External / Internal			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) NIL								

CO5:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 304	CO Code 05	LO Code 01	Format No.4
COURSE NAME		MECHANICS OF MACHINE					
CO Description		To understand the need for balancing of masses and concept of vibration.					
LO Description		To understand the concept, need and methods for balancing of masses.					
SCHEME OF STUDY							
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rks
1	Concept of balancing; Balancing of single rotating mass; Graphical method for balancing of several masses revolving in same plane; balancing of a single rotating mass by two masses in different planes.	Traditional Lecture method+ assignment	Teacher will explain the need of balancing and method of balancing of masses.	12	--	Handout, Book,	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions.	12	Progressive Test paper/ End semester exam	External / Internal		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) NIL							

CO5:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 304	CO Code 05	LO Code 02	Format No.4
COURSE NAME		MECHANICS OF MACHINE					
CO Description		To understand the need for balancing of masses and concept of vibration.					
LO Description		To understand the concept, terminology and causes of vibration.					
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 and terminology used in vibrations, types of Vibratory motion, Causes of vibrations in machines; their harmful effects and remedies.	Traditional Lecture method +Assignment	Teacher will explain the contents to students so that students can understand the concepts and causes of vibration along with their harmful effects and remedies.	8	-	Handout, Book	
SCHEME OF ASSESSMENT							
S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal		
1	Paper pen test	For the given learning content, Students write answer of questions.	8	Progressive Test paper/ End semester exam	External / Internal		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) NIL							

Reference Books:

1. Strength of Materials, R. S. Khurmi, , S. Chand & Co., Ram Nagar, New Delhi – 2002
2. Strength of Materials, S. Ramamrutham, 15 th Edn 2004, Dhanpat Rai Pub. Co., New Delhi.
3. Strength of Materials, S. S. Rattan, Tata Mcgraw hill, New Delhi, 2008, ISBN 9780070668959
4. Strength of Materials, B K Sarkar, I Edition, 2003 Tata Mcgraw Hill, New Delhi
5. Theory of machines – S.S .Rattan , Tata McGraw-Hill publications.
6. Theory of machines – R.S. Khurmi & J.K.Gupta , S.Chand publications.
7. Theory of machines – R.K.Bansal ,Laxmi publications
8. Dynamics of Machines – J B K Das, Sapna Publications.Theory of machines – Jagdishlal, Bombay Metro – Politan book Ltd.

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3		Sheet No. 1/3	
Branch		ALL BRANCHES		Semester		III	
Course Code		Course Name		PROFESSIONAL DEVELOPMENT-III			
Course Outcome 1		Student will be able to perform as the team leader of small team for solving a team problem in the given situation				Teach Hrs	Marks
Learning Outcome 1		Student will be able to demonstrate his/her understanding of leadership required in a team work performance				10	10
Contents		Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders					
Method of Assessment		Paper pen test					
Learning Outcome 2		Student will be able to play role of the leader of a team for solving a team problem in the given situation				10	15
Contents		Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders					
Method of Assessment		Student's role play					
Course Outcome 2		Student will be able to apply professional ethics in a given problem situation					
Learning Outcome 1		Student will be able to demonstrate his/her understanding of professional ethics				10	10
Contents		Professional ethics, its need and importance, seven ethics common to all professionals, general code of ethics for engineers, ethical issues for engineers, common problems related to professional ethics, ethical issues, identification of ethical issues in cases for engineers.					

Method of Assessment	Paper pen test		
Learning Outcome2	Student will be able to apply appropriate professional ethics in a given problem situation	10	10
Contents	Procedure of solving the problems related professional ethics, Identification of ethical issue, identification of the ethical stand, searching various possible solutions for the problem keeping ethical stand in focus, selection of appropriate solution.		
Method of Assessment	Paper pen test		
Course Outcome 3	Student will be able to plan self-learning to complete the given task	Teach Hrs	Marks
Learning Outcome 1	Student will be able to identify the self-learning needs for completing the given task	10	10
Contents	Lifelong learning, its examples, self-directed learning, its examples, important steps in lifelong learning, identification of learning needs		
Method of Assessment	Assessment through student activity		
Learning Outcome 2	Student will be able to plan self directed learning for completing the given task	10	10
Contents	Need for planning, need for planning self directed learning, planning self directed learning, self directed learning plan, examples.		
Method of Assessment	Assessment through student activity		

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME				Branch Code			Course Code			CO Code	LO Code	Format No. 4
						M	0	2	3	0	5	1	1	
COURSE NAME	Professional Development-III													
CO Description	Student will be able to perform as the team leader of small team for solving a team problem in the given situation													
LO Description	Student will be able to demonstrate his/her understanding of leadership required in a team work performance													
SCHEME OF STUDY														
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students							
SCHEME OF ASSESSMENT														
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal									
1	Paper pen test	A test will be designed and administered by the teacher to assess the understanding of student. Assessment will be done through Rating Scale.	10	Test paper and Rating Scale	Internal									
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)														
Important qualities of team leader:- will be able to <ol style="list-style-type: none"> 1. to take initiatives 2. take responsibility on behalf of group 3. to visualize the team event and plan things for the event 4. to take interest to carry out related activities 														

5. to take interest in solving team related problems

The test questions :-

1. Explain the importance of team leadership
2. Explain important qualities of good team-leaders
3. Identify the team leader's behavior in the following list of team persons' behavior
4. Identify the team leader in the following case of team event
5. Suggest the team leader's would be course of action in the following team problem situation

Performance indicators

1. Quality of response the Q. 1
2. Quality of response to Q. 2
3. Number of correct behaviors identified in Q. 3(Max. 3 correct behaviors out of 10)
4. Correct team leader identified or not, in Q. 4
5. Correct team leader course of action suggested or not, in Q. 5

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME				Branch Code		Course Code		CO Code	LO Code	Format No. 4
						M	0	2	3	0	5	
COURSE NAME	Professional Development-III											
CO Description	Student will be able to perform as the leader of small team for solving a team problem in the given situation											
LO Description	Student will be able to play role of the leader of a team for solving a team problem in the given situation											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRS Required	Remarks					
1	Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders	Case Study method	Teacher will organize a students' team event in class/ department. Few students will be asked to play roles of team members and the leader to solve team problems under given situation. Other students will observe. Afterward, teacher will discussion with students. Teacher will organize similar events for practice.	02	08	video film*	*Teacher will suggest a suitable online video to be viewed by students					
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal							
1	Student's role play	The teacher will organize small team events in batches in which individual students will be asked to play role of leader to solve a team problem, under given situation. Teacher will observe and assess the extent of leader's behavior performed by students on the basis of performance indicators	15	Rating Scale	Internal							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
The assessment will be done on basis of following performance indicators:- <ol style="list-style-type: none"> 1. Extent to which student take initiatives 2. Extent to which student take responsibility on behalf of group 3. Extent to which student visualize the team event and plan things for the event 4. Extent to which student take interest to carryout team related activities 												

5. Extent to which student take interest in solving team related problems

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
								3	0	5	2	1	
COURSE NAME		Professional Development-III											
CO Description		Student will be able to apply professional ethics in a given problem situation											
LO Description		Student will be able to demonstrate his/her understanding of professional ethics											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Professional ethics, its need and importance, seven ethics common to all professionals, general code of ethics for engineers, ethical issues for engineers, common problems related to professional ethics, ethical issues, identification of ethical issues in cases for engineers.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students						
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required				External / Internal					
1	Paper pen test	A test will be designed and administered by the teacher to assess the understanding of student. Assessment will be done through Rating Scale.	10	Test paper and Rating Scale				Internal					

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. Ethics common to all professions

- honesty
- trustworthiness
- loyalty
- respect for others
- adherence to the law
- doing good and avoiding harm to others
- Accountability.

2. General code of ethics for engineers:-

1. Respect for People's Dignity and Rights
2. Responsible Practice
3. Integrity in Relationships
4. Responsibility

3. Common Ethical issues for engineers:-

- Relationships with clients, consultants, competitors, and contractors
- Ensuring legal compliance by clients, client's contractors, and others
- Conflict of interest
- Bribery and kickbacks, which might include:
Gifts, meals, services, entertainment and recreation opportunities
- Treatment of confidential or proprietary information

- Consideration of the employer's assets
- Outside employment/activities

Test Performance Indicators:-

Extent to which student will be able

1. To explain the professional ethics (2 marks)
2. To explain the need and importance of professional ethics (2 marks)
3. To explain seven ethics common to all professions (2 marks)
4. To identify the problem related to professional ethics in given list of problems (2 marks)
5. To identify the ethical issue for an engineer in a given case of professional ethics (2 marks)

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
								3	0	5	2	2	
COURSE NAME	Professional Development-III												
CO Description	Student will be able to apply professional ethics in a given problem situation												
LO Description	Student will be able to apply appropriate professional ethics in a given problem situation												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Procedure of solving the problems related professional ethics, Identification of ethical issue, identification of the ethical stand, searching various possible solutions for the problem keeping ethical stand in focus, selection of appropriate solution.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students						
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Paper pen test	A case based test on problem of ethical issue for an engineer will be designed and administered by the teacher to assess the ability of students to solve the ethical problem; Assessment will be done through Rating Scale.	10	Test paper and Rating Scale	Internal								

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Steps in solving ethical problems:-

1. Identify the ethical issue in the problem
2. Identify the ethical stand in the problem
3. Search for various possible solutions keeping focus on the ethical stand
4. Implement the best possible solution

Performance indicators:-

1. Correctness of identified ethical issue in the problem (3 marks)
2. Correctness of identified ethical stand (3 marks)
3. Quality of suggested possible solutions (2 marks)
4. Appropriateness of selected best possible solution (2 marks)

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME				Branch Code			Course Code			CO Code	LO Code	Format No. 4
						M	0	2	3	0	5	3	1	
COURSE NAME	Professional Development-III													
CO Description	Student will be able to plan self-learning to complete the given task													
LO Description	Student will be able to identify the self-learning needs for completing the given task													
SCHEME OF STUDY														
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Lifelong learning, its examples, self-directed learning, its examples, important steps in lifelong learning, identification of learning needs	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students							
SCHEME OF ASSESSMENT														
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal							
1	Assessment through student activity	A Self-assessment portfolio will be prepared by the student on the task assigned by the teacher. Assessment of portfolio will be done through Rating Scale.	10	Portfolio format and Rating Scale			Internal							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)														
<p>1. Lifelong learning</p> <p>All learning activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective. It is voluntary, self-initiated and self-directed learning.</p> <p>Examples:-</p>														

1. We learn to use smart phones (informal learning)
2. We learn yoga by joining a one week yoga training programme organized by a private spiritual institute (formal learning).

2. Self directed learning

A process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes.

3. Essential steps of lifelong learning

1. Identification of self learning need (what to learn)
2. Searching about how I can learn, search of learning resources and ways/means to use them for learning
3. Planning self-learning
4. Implementing the plan

4. Suggested list of tasks for practice of identification of learning needs

1. You have to repair your faulty house-hold electric iron
2. You have to daily operate the new washing machine purchased at your home
3. You have to format your PC
4. You have to attend online class using meet.google app
5. You have to share your ideas online with your distant friends. You have to arrange a webinar
6. You have to visit abroad and therefore you have to apply for passport
7. Your mother is a patient of high BP. You have to measure her BP daily two times at home with traditional BP measuring apparatus
8. Your bike is not getting started. You have to check its spark plug.
9. You have to complete bank paper formalities for bank loan to establish your small manufacturing unit
10. You have to prepare French-fries at home.

5. Self-assessment portfolio

A questionnaire in which questions are in first person and space is provided after each question to write the answer. It is prepared by the student.

6. Self-assessment portfolio questions:-

1. Can I complete this task ?
2. Is there special knowledge or skill required to complete the task ?

3. What knowledge or skill is required to complete this task ?
4. Do I have this knowledge or skill ?
5. From where I can learn this knowledge or skill. (Mention at least three sources. Sources may be people, institutions, books, websites?)
6. How I can manage to learn this knowledge or skill?

7. Indicators of performance

1. Able to identified that he/she can-not complete the given task due to lack of knowledge or skill
2. Able to identified the need for special knowledge or skill to complete the task
3. Correctness of identified knowledge or skill required to complete the task
4. Appropriateness of sources from which student can learn knowledge or skill
- 5.** Extent of feasibility of student's way to acquire the required knowledge or skill

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code		Course Code		CO Code	LO Code	Format No. 4
					M	0	2	3	0	5	
COURSE NAME	Professional Development-III										
CO Description	Student will be able to plan self directed learning to complete the given task										
LO Description	Student will be able to plan self directed learning for completing the given task										
SCHEME OF STUDY											
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks				
1.	Need for planning, need for planning self directed learning, planning self directed learning, self directed learning plan, examples.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment of preparing self-directed learning plan for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students				
SCHEME OF ASSESSMENT											
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required		External / Internal					
1	Assessment through student activity	A self directed learning plan will be prepared by the student on the task assigned by the teacher. Assessment of the plan will be done through Rating Scale.	10	Plan format and Rating Scale		Internal					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)											
1. Self directed learning											
A process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes.											
3. Essential steps of lifelong learning											
5. Identification of self learning need (what to learn)											

6. Searching about how I can learn, search of learning resources and ways/means to use them for learning
7. Planning self directed learning
8. Implementing the plan

4. Contents of the plan

1. Description of knowledge or skill to be self-learned
2. Description of selected source of learning the knowledge or skill ie people, books, institutions, websites etc.
3. Description of method of self-directed learning viz formal learning or informal learning
4. Description of additional resources / learning resources required
5. Expected time required to learn along with justification

5. Indicators of performance

1. Quality of description of knowledge or skill to be self-learned (3 marks)
2. Appropriateness of selected source of knowledge or skill learning (3 marks)
3. Appropriateness of method of self-learning (1 mark)
4. Appropriateness of additional resources / learning resources required (1 mark)
- 5.** Appropriateness of time required to learn (1 mark)