

RAJIV GANDHI PROUDYOGIKI VISHVAVIDYALAYA (DIPLOMA WING)

BHOPAL P05 DIPLOMA IN PRODUCTION ENGINEERING

PART A:- PROCESS OF CURRICULUM DEVELOPMENT

LIST OF IDENTIFIED PROFESSIONAL ROLES

1. To apply knowledge of mathematics, science, and engineering.
2. To design and conduct experiments, as well as to analyze and interpret data.
3. To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. To function on multidisciplinary teams.
5. To identify, formulate, and solve engineering problems.
6. To understand professional and ethical responsibility.
7. To communicate effectively.
8. To understand the impact of engineering solutions in a global, economic, environmental, and societal context.
9. To engage in lifelong learning.
10. To use the techniques, skills, and modern engineering tools necessary for engineering practice.

LIST OF SELECTED TERMINAL BEHAVIORS--

1. To apply knowledge of mathematics, science, and engineering.
TB-1 To understand types and causes of wear. (602)
TB-2 To understand lubrication and required properties of lubricants. (602)
2. To design and conduct experiments, as well as to analyze and interpret data.
TB-1 To identify and measure wear on a part. (602)
TB-2 To select proper tool and gauge during maintenance of a machine or equipment. (602)
3. To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. NIL
4. To function on multidisciplinary teams. NIL
5. To identify, formulate, and solve engineering problems
TB- 1 To locate fault in machine or equipment and take a decision to repair or replace the part. (602)
6. To understand professional and ethical responsibility NIL
7. To communicate effectively NIL
8. To understand the impact of engineering solutions in a global, economic, environmental, and societal context. NIL
9. To engage in lifelong learning
TB-1 To use grease gun in lubricating various components of any machine. (602)
TB-2 To operate fire extinguisher. (602)
10. To use the techniques, skills, and modern engineering tools necessary for engineering practice. NIL

FRAMED COs FOR SELECTED TERMINAL BEHAVIORS

1. To apply knowledge of mathematics, science, and engineering.
 - TB-1 To understand types and causes of wear. (602)
 - C04: Explain types of wear and the importance of lubrication.
 - TB-2 To understand lubrication and required properties of lubricants. (602)
 - C04: Explain types of wear and the importance of lubrication.
2. To design and conduct experiments, as well as to analyze and interpret data.
 - TB-1 To identify and measure wear on a part. (602)
 - C04: Explain types of wear and the importance of lubrication.
 - TB-2 To select proper tool and gauge during maintenance of a machine or equipment. (602)
 - CO1: Demonstrate understanding of the importance of plant maintenance.
3. To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. NIL
4. To function on multidisciplinary teams. NIL
5. To identify, formulate, and solve engineering problems
 - TB- 1 To locate fault in machine or equipment and take a decision to repair or replace the part. (602)
 - CO2: Describe the types of maintenance and general maintenance practices.
6. To understand professional and ethical responsibility NIL
7. To communicate effectively NIL
8. To understand the impact of engineering solutions in a global, economic, environmental, and societal context. NIL
9. To engage in lifelong learning
 - TB-1 To use grease gun in lubricating various components of any machine. (602)
 - C04: Explain types of wear and the importance of lubrication.
 - TB-2 To operate fire extinguisher. (602)
 - C05: Explain the general safety regulations in a plant.
10. To use the techniques, skills, and modern engineering tools necessary for engineering practice. NIL

CO GROUPING AND COURSE FORMATION

COURSE NAME: - MAINTENANCE ENGINEERING AND SAFETY (602)

(Total 100 Hrs. , Total 100 Marks)

LIST OF COs:-

CO1: Demonstrate understanding of the importance of plant maintenance. (20 Hrs, 20 marks)

CO2: Describe the types of maintenance and general maintenance practices. (20 Hrs, 20 marks)

CO3: Describe the concept of maintainability and optimum maintenance cost. (20 Hrs, 20 marks)

CO4: Explain types of wear and the importance of lubrication. (20 Hrs, 20 marks)

CO5: Explain the general safety regulations in a plant. (20 Hrs, 20 marks)

LOs FORMATION

COURSE NAME: - MAINTENANCE ENGINEERING AND SAFETY (602)
(Total 100 Hrs. , Total 100 Marks)

List of COs and LOs

CO1: Demonstrate understanding of the importance of plant maintenance. (20 Hrs, 20 marks)

LO1: To explain the effect of maintenance on productivity of a plant. (10 Hrs., 10 Marks)

LO2: To explain the functions of maintenance department in an industry. (10 Hrs., 10Marks)

CO2: Describe the types of maintenance and general maintenance practices. (20 Hrs, 20 marks)

LO1: To explain different types of maintenance. (08 Hrs., 08 Marks)

LO2: To understand concept of fault tracing. (06 Hrs., 06 Marks)

LO3: To explain the steps involved in different types of maintenance. (06 Hrs., 06 Marks)

CO3: Describe the concept of maintainability and optimum maintenance cost. (20 Hrs, 20 marks)

LO1: To explain maintainability and factors affecting maintainability. (10 Hrs., 10 Marks)

LO2: To define the components of maintenance cost in an industry. (10 Hrs., 10 Marks)

CO4: Explain types of wear and the importance of lubrication. (20 Hrs, 20 marks)

LO1: To know about the types of wear and the concept of permissible wear. (10 Hrs., 10 Marks)

LO2: To know the purpose and types of lubrication. (10 Hrs., 10 Marks)

CO5: Explain the general safety regulations in a plant. (20 Hrs, 20 marks)

LO1: To know about the concept of safety in an industry. (10 Hrs., 10 Marks)

LO2: To know about general safety practices in an industry. (10 Hrs., 10 Marks)

PART B:- CURRICULUM OF PRODUCTION ENGINEERING

RGPV (Diploma Wing) Bhopal			COURSE PLAN				Format -2	Sheet No. 1/2	
Course Name		MAINTENANCE ENGINEERING & SAFETY			Semester		SIXTH		
Branch	PRODUCTION ENGINEERING		Course Code	602	No. of COs	05	No. of LOs	11	
Total Hrs. of Teaching Learning	100	Total Marks	100	Total no. of Assessments		Types of Assessments		No. of External Assessments	
DESCRIPTION OF OUTCOMES							T-L Hrs.	Max. Marks	
CO 01	P053021	Demonstrate understanding of the importance of plant maintenance.					20	20	
Los	PO530211	To explain the effect of maintenance on productivity of a plant.					08	08	
	PO530212	To explain the functions of maintenance department in an industry.					12	12	
CO 02	P053022	Describe the types of maintenance and general maintenance practices.					20	20	
Los	PO530221	To explain different types of maintenance.					08	08	
	PO530222	To understand concept of fault tracing.					06	06	
	PO530223	To explain the steps involved in different types of maintenance.					06	06	
CO 03	P053023	Describe the concept of maintainability and optimum maintenance cost.					20	20	
Los	PO530231	To explain maintainability and factors affecting maintainability.					10	10	
	PO530232	To define the components of maintenance cost in an industry.					10	10	
CO 04	P053024	Explain types of wear and the importance of lubrication.					20	20	
Los	PO530241	To know about the types of wear and the concept of permissible wear.					10	10	
	PO530242	To know the purpose and types of lubrication.					10	10	
CO 05	P053025	Explain the general safety regulations in a plant.					20	20	

Los	PO530251	To know about the concept of safety in an industry.	10	10
	PO530252	To know about general safety practices in an industry.	10	10

RGPV (DIPLOMA WING) BHOPAL		OCB CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/3
Branch	PRODUCTION ENGINEERING		Semester	SIXTH	
Course Code	602	Course Name	MAINTENANCE ENGINEERING & SAFETY		
Course Outcome 1	Demonstrate understanding of the importance of plant maintenance.			Teach Hrs	Mark s
Learning Outcome 1	To explain the effect of maintenance on productivity of a plant.			08	08
CONTENT	Introduction to maintenance, its need and economic significance, effects on productivity, energy conservation, man-machine relationship, increased life of machines, equipment and their enhanced availability.				
Method of Assessment	Paper pen test				
Learning Outcome 2	To explain the functions of maintenance department in an industry.			12	12
CONTENT	Scope and functions of Maintenance, Classification of functions: Primary & Secondary, responsibilities of maintenance department, General nature of maintenance problems in Industries, Development trends in maintenance , Maintenance of rotating , reciprocating Parts & fixed joints.				
Method of Assessment	Paper pen test / Practical assessment				
Course Outcome 2	Describe the types of maintenance and general maintenance practices.				
Learning Outcome 1	To explain different types of maintenance.			08	08
CONTENT	Different types of Maintenance Practices e.g. Productive maintenance, Preventive Maintenance, Corrective maintenance, Breakdown maintenance etc., Equipment repairs history and history analysis, condition monitoring of equipment				
Method of Assessment	Paper pen test				
Learning Outcome 2	To understand concept of fault tracing.			06	06
CONTENT	Sequence of activities in fault finding, decision tree & Logical structure, methods and procedure of repair, measures to prevent repetition of similar faults.				
Method of Assessment	Paper pen test				

Learning Outcome 3	To explain the steps involved in different types of maintenance.	06	06
CONTENT	Sequence of activities in break down maintenance, servicing and overhauling: concept & procedure, Principles and procedure for preventive maintenance.		
Method of Assessment	Paper pen test/ Practical assessment		
Course Outcome 3	Describe the concept of maintainability and optimum maintenance cost.		
Learning Outcome 1	To explain maintainability and factors affecting maintainability.	10	10
CONTENT	Concept of maintainability & its significance, Definition, objective of maintainability, factors affecting maintainability, reliability index, optimum volume of maintenance		
Method of Assessment	Paper pen test		
Learning Outcome 2	To define the components of maintenance cost in an industry.	10	10
CONTENT	Maintenance cost components, estimation of maintenance labour cost methods, estimation methods of material cost, overhead cost, maintenance cost control, maintenance budget. kelvin's graph.		
Method of Assessment	Paper pen test		
Course Outcome 4	Explain types of wear and the importance of lubrication.		
Learning Outcome 1	To know about the types of wear and the concept of permissible wear.	10	10
CONTENT	Wear, causes of wear, types of wear, measurement of wear, concept of permissible wear, effects of wear, wear reduction factors, components replacement, deciding factors,, vibrations, causes of vibrations.		
Method of Assessment	Paper pen test/ Practical assessment		
Learning Outcome 2	To know the purpose and types of lubrication.	10	10
CONTENT	Concept and significance of lubrication, functions of lubrication, principle of lubrication, hydrodynamic lubrication, boundary lubrication, hydrostatic lubrication, classification of lubricants, Important properties of lubricants, selection of lubricants, types of oil feed systems, oil changes: need & sequence for oil change.		

Method of Assessment	Paper pen test/ Practical assessment		
Course Outcome 5	Explain the general safety regulations in a plant.		
Learning Outcome 1	To know about the concept of safety in an industry.	10	10
CONTENT	Safety principles and practices, safe layout, safety aspects of machines/equipment, safety arrangements during manufacturing processes e.g. welding, grinding, machining, handling of chemical, regular plant inspection & safety audit, hazard analysis, safety aspects in m/c maintenance and lubrication, safety during material handling in shops, safety management.		
Method of Assessment	Paper pen test/ Practical assessment		
Learning Outcome 2	To know about general safety practices in an industry.	10	10
CONTENT	Salient points of safety regulations, fire safety measures, types of fire extinguishers, safe working environment and safety consciousness, Industrial housekeeping, basic requirements for good housekeeping.		
Method of Assessment	Paper pen test/ Practical assessment		

CO1:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 602	CO Code 01	LO Code 01	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY						
CO Description		Demonstrate understanding of the importance of plant maintenance.						
LO Description		To explain the effect of maintenance on productivity of a 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	Introduction to maintenance, its need and economic significance, effects on productivity, energy conservation, man-machine relationship, increased life of machines, equipment and their enhanced availability	Traditional Lecture method + Assignment	Teacher will explain the contents so that students understand the importance of maintenance in Work Shop/ Industry. Teacher will conduct Progressive test/ give assignment.	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/ 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 602	CO Code 01	LO Code 02	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY					
CO Description		Demonstrate understanding of the importance of plant maintenance.					
LO Description		To explain the functions of maintenance department in an industry.					
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	Scope and functions of Maintenance, Classification of functions: Primary & Secondary, responsibilities of maintenance department, General nature of maintenance problems in Industries, Development trends in maintenance , Maintenance of rotating , reciprocating Parts & fixed joints.	Traditional Lecture method + Practical (Work Shop/ Industry Visit)	Teacher will explain the content so that students explain the scope and functions of maintenance department in an industry. Teacher will conduct Progressive test/ give assignment. Students will visit work shop/ Industry to understand the maintenance procedure.	8	4	Handout, Book, Work 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	12	Practical file/Progressive test/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							
List of Practical							
1. Study of various tools and gauges used in mechanical maintenance.							

CO2:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 602	CO Code 02	LO Code 01	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY						
CO Description		Describe the types of maintenance and general maintenance practices.						
LO Description		To explain different types of maintenance.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Different types of Maintenance Practices e.g. Productive maintenance, Preventive Maintenance, Corrective maintenance, Breakdown maintenance etc., Equipment repairs history and history analysis, condition monitoring of equipment	Traditional Lecture method + Assignment	Teacher will explain the contents to students so that students explain different types of maintenance. Teacher will conduct Progressive test/ give assignment.	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:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 602	CO Code 02	LO Code 02	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY						
CO Description		Describe the types of maintenance and general maintenance practices.						
LO Description		To understand concept of fault tracing.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Sequence of activities in fault finding, decision tree & Logical structure, methods and procedure of repair, measures to prevent repetition of similar faults.	Traditional Lecture method + Assignment	Teacher will explain the contents to students so that students know about the concept of fault tracing. 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	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 602	CO Code 02	LO Code 03	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY					
CO Description		Describe the types of maintenance and general maintenance practices.					
LO Description		To explain the steps involved in different types of maintenance.					
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	Sequence of activities in break down maintenance, servicing and overhauling: concept & procedure, Principles and procedure for preventive maintenance.	Traditional Lecture method + Practical (Work Shop/ Industry)	Teacher will explain the contents to students so that they will know about the steps involved in preventive and breakdown maintenance. The students will also learn about this during visit to workshop /industry. Teacher will conduct Progressive test/give assignment.	4	2	Handout, Book, Work 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	6	Practical file/ Progressive test/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							
List of Practical							
1. Visit of workshop/ industry for collecting information regarding equipment maintenance							

CO3:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 602	CO Code 03	LO Code 01	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY						
CO Description		Describe the concept of maintainability and optimum maintenance cost.						
LO Description		To explain maintainability and factors affecting maintainability.						
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 of maintainability & its significance, Definition, objective of maintainability, factors affecting maintainability, reliability index, optimum volume of maintenance.	Traditional Lecture method + Assignment	Teacher will explain the contents to students so that students understands the concept of maintainability. 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	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								

CO3:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 602	CO Code 03	LO Code 02	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY						
CO Description		Describe the concept of maintainability and optimum maintenance cost.						
LO Description		To define the components of maintenance cost in an industry.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Maintenance cost components, estimation of maintenance labour cost methods, estimation methods of material cost, overhead cost, maintenance cost control, maintenance budget. kelvin's graph.	Traditional Lecture method + Assignment	Teacher will explain the contents to students so that students will learn about the components of maintenance cost. 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	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 602	CO Code 04	LO Code 01	Format No. 4	
COURSE NAME	MAINTENANCE ENGINEERING & SAFETY						
CO Description	Explain types of wear and the importance of lubrication.						
LO Description	To know about the types of wear and the concept of permissible wear.						
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	Wear, causes of wear, types of wear, measurement of wear, concept of permissible wear, effects of wear, wear reduction factors, components replacement, deciding factors,, vibrations, causes of vibrations.	Traditional Lecture method + Practical (Work Shop)	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	6	4	Handout, Book, Work 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/Progres sive Test paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							
List of Practical							
1. Measurement of wear on cylindrical surfaces by: Vernier caliper/ Micrometer / Dial indicator and v block							

CO4:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 602	CO Code 04	LO Code 02	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY						
CO Description		Explain types of wear and the importance of lubrication.						
LO Description		To know the purpose and types of lubrication.						
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 significance of lubrication, functions of lubrication, principle of lubrication, hydrodynamic lubrication, boundary lubrication, hydrostatic lubrication, classification of lubricants, Important properties of lubricants, selection of lubricants, types of oil feed systems, oil changes: need & sequence for oil change.	Traditional Lecture method + Practical (Work Shop / Industry)	Teacher will explain the contents. Teacher will conduct Progressive test/ give Assignment so that students know about the concept and importance of lubrication in an industry. Students will visit Work Shop / Industry to know the lubrication plans and procedures.	6	4	Handout, Book, Work 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/Progressive Test paper/ End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practical								
<ol style="list-style-type: none"> Demonstration and operation of grease gun in lubricating various components of any available machine. Visit of Work Shop/ industry for collecting information regarding lubrication plans. 								

CO5:LO1

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME	Branch Code P05	Course Code 602	CO Code 05	LO Code 01	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY					
CO Description		Explain the general safety regulations in a plant.					
LO Description		To know about the concept of safety in an industry.					
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	Safety principles and practices, safe layout, safety aspects of machines/equipment, safety arrangements during manufacturing processes e.g. welding, grinding, machining, handling of chemical, regular plant inspection & safety audit, hazard analysis, safety aspects in m/c maintenance and lubrication, safety during material handling in shops, safety management.	Traditional Lecture method + Practical (Work Shop / Industry)	Teacher will explain the contents to students so that students know about the possible defects in welded joints along with their causes and remedies	6	4	Handout, Book, Work 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 paper/ End semester exam	Internal /External		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)							
List of Practical							
<ol style="list-style-type: none"> 1. Demonstration and operation of protective equipment. 2. Demonstration and operation of fire extinguisher equipment. 							

CO5:LO2

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code P05	Course Code 602	CO Code 05	LO Code 02	Format No. 4
COURSE NAME		MAINTENANCE ENGINEERING & SAFETY						
CO Description		Explain the general safety regulations in a plant.						
LO Description		To know about general safety practices in an industry.						
SCHEME OF STUDY								
S. No.	Learning Content	Teaching– Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks	
1	Salient points of safety regulations, fire safety measures, types of fire extinguishers, safe working environment and safety consciousness, Industrial housekeeping, basic requirements for good housekeeping.	Traditional Lecture method/ Industry Visit	Teacher will explain the contents to students so that students know about safety measures taken in an industry. Students will visit industry to know about safety practices.	8	2	Handout, Book		
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 paper/End semester exam	Internal /External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)								
List of Practical								
1. Visit of Work Shop/ Industry for collecting information regarding safety measures.								

Reference Books:

1. Maintenance of Industrial equipments by B. Gelberg G. Poklis
2. A guide to efficient Maintenance Management by H. V. Mst watt
3. Modern Maintenance management by Miller and blood.
4. Maintainability by Benjamin S. Blanshard, E Edward lowery
5. Maintenance engineering hand book By Mcrow
6. An Introduction to safety Engineering and Management By N. V. Krishnan
7. Accident prevention Manual for industrial operations by Frank E. McElory,
P. E., C. S. P. editor in chief national safety council.