

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

<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>
<b>CO Description</b>	<b>Discuss fluids, properties of fluid, pressure and its measurements.</b>
<b>LO Description</b>	Compare different fluids on the basis of their properties/characteristics.

#### SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Definition of fluid, Types of fluid- Ideal and Real fluids, Compressible and Incompressible fluids, Newtonian and non-Newtonian fluid, viscous and non- viscous fluids, rotational and ir-rotational fluids, fluid properties- Density, Specific weight, Specific gravity, Specific volume, Vapour pressure, surface tension, capillarity, Dynamic and kinematic viscosity.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	06	00	Handouts, chalk board, PPT, text book, charts, graphs, video film.	

#### SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	Student will be asked to compare given fluids on the basis of given properties.	10	Question paper + Rating scale	Internal

#### ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Progressive Test- I

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					M	0	2	4	0	2	1	2	
COURSE NAME		Fluid Mechanics & Hydraulic Machinery											
CO Description		Discuss fluids, properties of fluid, pressure and its measurements.											
LO Description		Measure pressure using simple and differential manometers.											
<b>SCHEME OF STUDY</b>													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	<b>Pressure and Its Measurement:</b> Fluid pressure and its units, atmospheric pressure, gauge pressure, vacuum pressure, absolute pressure, pressure head, Pascal’s law, manometers-principle, its types- Simple and Differential manometer	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of lab work. The students will learn through practice.	04	06	Handouts, chalk board, PPT, text book, charts, video film, virtual lab, models.							
<b>SCHEME OF ASSESSMENT</b>													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Laboratory test by observation	Student will be asked to measure pressure using simple and differential manometers.	10	Observation schedule/check-list /rating scales /rubrics	Internal								
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
Part of Lab Work													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code			Course Code			CO Code	LO Code	Format No. 4
				M	0	2	4	0	2	1	3	
<b>COURSE NAME</b>		Fluid Mechanics & Hydraulic Machinery										
<b>CO Description</b>		Discuss fluids, properties of fluid, pressure and its measurements.										
<b>LO Description</b>		Solve numerical problems based on Pascal's law.										
<b>SCHEME OF STUDY</b>												
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	Numerical problems based on Pascal's law, Simple and Differential manometers for pressure measurement.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	05	00	Handouts, chalk board, PPT, text book, charts, graphs, video film.						
<b>SCHEME OF ASSESSMENT</b>												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal							
1	Theory exam	Student will be asked to calculate pressure using Pascal's law for a given problem.	06	Question paper + Rating scale	External							
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>												
Part of Theory Exam												

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					M	0	2	4	0	2	2	1	
COURSE NAME		Fluid Mechanics & Hydraulic Machinery											
CO Description		Measure discharge using Venturimeter, Orifice-meter, Pitot-tube.											
LO Description		Compare different fluid flow based on properties/characteristics.											
<b>SCHEME OF STUDY</b>													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	<b>Basics of Fluid Flow:-</b> potential energy, kinetic energy, pressure energy, total energy, Types of fluid flow- Laminar, turbulent and transient, Steady and Unsteady, Uniform and non-uniform	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	04	00	Handouts, chalk board, PPT, text book, video film.							
<b>SCHEME OF ASSESSMENT</b>													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Paper pen test	Student will be asked to compare given fluid flows based on given properties/characteristics.	10	Question paper + Rating scale	Internal								
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
Part of Progressive Test – II													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					M	0	2	4	0	2	2	2	
COURSE NAME		Fluid Mechanics & Hydraulic Machinery											
CO Description		Measure discharge using Venturimeter, Orifice-meter, Pitot-tube.											
LO Description		Apply Bernoulli's theorem and Continuity equation for a given situation.											
<b>SCHEME OF STUDY</b>													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Continuity equation, Bernoulli's theorem:- Assumptions, Equation and its applications.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	06	00	Handouts, chalk board, PPT, text book, charts, video film.							
<b>SCHEME OF ASSESSMENT</b>													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Theory exam	Student will be asked to apply Bernoulli's theorem and Continuity equation for a given situation.	10	Question paper + Rating scale			External						
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
Part of Theory Exam													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					M	0	2	4	0	2	2	3	
<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>												
<b>CO Description</b>	<b>Measure discharge using Venturimeter, Orifice-meter, Pitot-tube.</b>												
<b>LO Description</b>	Measure discharge using Venturimeter, Orifice-meter, Pitot-tube.												
<b>SCHEME OF STUDY</b>													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Venturimeter- Principle, Construction and working, discharge through Venturimeter, Vena contracta, Orifice- meter- Principle, Construction and working, discharge through Orifice-meter , Pitot-tube - Principle, Construction and working, hydraulic coefficients-Cc, Cv and Cd	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of lab work. The students will learn through practice.	06	09	Handouts, chalk board, PPT, text book, charts, video film, virtual lab, models.							
<b>SCHEME OF ASSESSMENT</b>													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Laboratory test by observation	Student will be asked to measure discharge in a pipe using a given instrument.	10	Observation schedule/check-list /rating scales /rubrics	External								
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
Part of Practical Exam													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code			Course Code			CO Code	LO Code	Format No. 4
				M	0	2	4	0	2	3	1	
<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>											
<b>CO Description</b>	<b>Solve numerical problems based on minor, major losses in pipes and impact of jet.</b>											
<b>LO Description</b>	Measure Reynolds number and minor losses in pipes.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	<b>Flow Through Pipes:</b> Laminar, turbulent and transient flow, Reynolds number, differentiation of laminar, turbulent and transient flow on the basis of Reynolds number, minor losses in pipes.	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of lab work. The students will learn through practice.	02	09	Handouts, chalk board, PPT, text book, charts, video film, virtual lab, models..						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal							
1	Laboratory test by observation	Student will be asked to measure Reynolds number and minor losses for a given pipe.	10	Observation schedule/check-list /rating scales /rubrics	External							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
Part of Practical Exam												

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>			<b>Branch Code</b>			<b>Course Code</b>			<b>CO Code</b>	<b>LO Code</b>	Format No. 4
					<i>M</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>2</i>	
<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>												
<b>CO Description</b>	<b>Solve numerical problems based on minor, major losses in pipe flow and impact of jet.</b>												
<b>LO Description</b>	Calculate major losses in pipe flow using Darcy's equation and Chezy's equation.												
<b>SCHEME OF STUDY</b>													
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>			<b>Remarks</b>				
1	Calculate major losses in pipe flow using Darcy's equation and Chezy's equation.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	06	00	Handouts, chalk board, PPT, text book, charts, video film.							
<b>SCHEME OF ASSESSMENT</b>													
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>		<b>Maximum Marks</b>	<b>Resources Required</b>			<b>External / Internal</b>					
1	Theory exam	Student will be asked to calculate major losses in flow for a given pipe.		10	Question paper + Rating scale			External					
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
Part of Theory Exam													

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					M	0	2	4	0	2	3	3	
<b>COURSE NAME</b>		<b>Fluid Mechanics &amp; Hydraulic Machinery</b>											
<b>CO Description</b>		<b>Solve numerical problems based on minor, major losses in pipe flow and impact of jet.</b>											
<b>LO Description</b>		Calculate force exerted by a jet for a given vane/plate											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	<b>Impact of Jets:</b> Impact of Jet on fixed vertical flat plate, moving vertical flat plates and curved plates stationary and moving, velocity diagram. Simple numerical problems based on fixed vertical, moving plates.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	06	00	Handouts, chalk board, PPT, text book, charts, video film.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Theory Exam	Student will be asked to calculate force exerted by a jet of water for a given vane/plate.	08	Question paper + Rating scale	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Part of Theory Exam													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					M	0	2	4	0	2	4	1	
<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>												
<b>CO Description</b>	<b>Select a suitable hydraulic turbine for a given situation.</b>												
<b>LO Description</b>	Explain Construction, working and selection criteria of Pelton wheel, Francis and Kaplan turbine.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	<b>Hydraulic Turbines:</b> ., Classification of hydraulic turbines, Selection of turbine on the basis of head, discharge and specific speed, Construction, working principle of Pelton wheel, Francis and Kaplan turbine. <b>Draft tubes</b> –function, types, and construction, cavitation in turbines	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	15	00	Handouts, chalk board, PPT, text book, charts, video film.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Theory exam	Student will be asked to explain construction, working and selection criteria of a given turbine.	10	Question paper + Rating scale	External								
		Student will be asked to explain function, construction and working of a draft tube.	06										
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

Part of Theory Exam

RGPV (Diploma Wing ) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		<i>M</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>2</i>	

<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>
<b>CO Description</b>	<b>Select a suitable hydraulic turbine for a given situation.</b>
<b>LO Description</b>	Calculate work done, power, efficiency of a given turbine.

**SCHEME OF STUDY**

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Simple numerical problems on work-done, Power, efficiency of Impulse and Reaction turbines, Layout of hydroelectric power plant.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	06	00	Handouts, chalk board, PPT, text book, charts, video film.	

**SCHEME OF ASSESSMENT**

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory Exam	Student will be asked to calculate work done, power, efficiency of a given turbine.	10	Question paper + Rating scale	External

**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)**

Part of Theory Exam

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>			<b>Branch Code</b>			<b>Course Code</b>			<b>CO Code</b>	<b>LO Code</b>	Format No. 4
					<i>M</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>3</i>	
<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>												
<b>CO Description</b>	<b>Select a suitable hydraulic turbine for a given situation.</b>												
<b>LO Description</b>	Identify components of a given turbine.												
<b>SCHEME OF STUDY</b>													
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>			<b>Remarks</b>				
1	Demonstration of components of Pelton wheel, Francis and Kaplan turbine.	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of lab work. The students will learn through practice.	00	09	Handouts, chalk board, PPT, text book, charts, video film, virtual lab.							
<b>SCHEME OF ASSESSMENT</b>													
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>		<b>Maximum Marks</b>	<b>Resources Required</b>				<b>External / Internal</b>				
1	Laboratory test by observation	Student will be asked to describe function and construction of given draft tubes.		10	Observation schedule/check-list /rating scales /rubrics				External				
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													
Part of Practical Exam													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					M	0	2	4	0	2	5	1	
<b>COURSE NAME</b>		<b>Fluid Mechanics &amp; Hydraulic Machinery</b>											
<b>CO Description</b>		<b>Describe different hydraulic pumps for a given situation.</b>											
<b>LO Description</b>		Explain Principle, construction, working and performance of centrifugal pump.											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Principle, construction, working and applications of centrifugal pump, Types of casings and impellers, Concept of multistage pump, Manometric head, Work-done, Manometric and Overall efficiency. Calculations of overall efficiency and power required to drive pumps. Priming and its methods in centrifugal pump. Concept of Slip, Negative slip, Cavitation and separation.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	09	00	Handouts, chalk board, PPT, text book, charts, video film.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	<b>Theory Exam</b>	Student will be asked to explain principle, construction, working, and uses of centrifugal pump	10	Question paper + Rating scale	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Part of Theory Exam													

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>		<b>Branch Code</b>			<b>Course Code</b>			<b>CO Code</b>	<b>LO Code</b>	Format No. 4
				<i>M</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>2</i>	
<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>											
<b>CO Description</b>	<b>Describe different hydraulic pumps for a given situation .</b>											
<b>LO Description</b>	Explain Principle, construction, working and uses of reciprocating pump.											
<b>SCHEME OF STUDY</b>												
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>			<b>Remarks</b>			
1	Principle, construction, working and uses of single and double acting reciprocating pumps.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	06	00	Handouts, chalk board, PPT, text book, charts, video film.						
<b>SCHEME OF ASSESSMENT</b>												
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>	<b>Maximum Marks</b>	<b>Resources Required</b>			<b>External / Internal</b>					
1	<b>Paper pen test</b>	Student will be asked to explain principle, construction, working, and uses of reciprocating pump	10	Question paper + Rating scale			Internal					
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>												
Part of Term Work												

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<b>RGPV (Diploma Wing ) Bhopal</b>	<b>SCHEME FOR LEARNING OUTCOME</b>	<b>Branch Code</b>			<b>Course Code</b>			<b>CO Code</b>	<b>LO Code</b>	Format No. 4
		<i>M</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>3</i>	

<b>COURSE NAME</b>	<b>Fluid Mechanics &amp; Hydraulic Machinery</b>
<b>CO Description</b>	<b>Describe different hydraulic pumps for a given situation.</b>
<b>LO Description</b>	Measure overall efficiency of centrifugal pump

**SCHEME OF STUDY**

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Experimental determination of overall efficiency of a centrifugal pump.	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of lab work. The students will learn through practice.	00	06	Handouts, chalk board, PPT, text book, charts, video film, virtual lab.	

**SCHEME OF ASSESSMENT**

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to measure overall efficiency of a centrifugal pump using a given experimental setup.	10	Observation schedule/check-list /rating scales /rubrics	Internal

**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)**

Part of Lab Work