

PLANNED SYLLABUS COVERAGE(Theory)

GPK-F-17

P ngra LABUS VERAGE	Department: <u>Mechanical Engg.</u> Subject <u>Fluid Mechanics & Hydraulics</u>				
	Course <u>Diploma (MB)</u>		Duration <u>14 weeks</u>		
	Total Periods <u>56</u>		Theory <u>56</u>		
Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-4	I Properties of Fluids	Density, Specific gravity, Specific weight, Specific volume, Dynamic viscosity, Kinematic viscosity, Surface tension, Capillarity, Vapour pressure, compressibility	Fluids mechanics & Hydraulics machines by S.S. Rattan	
5-10	Fluid Pressure Pressure measurement	Fluid Pressure, Pressure head, Pressure intensity, concept of atmospheric pressure, absolute pressure, Simple and differential manometers, Bourdon pressure (simple problems on manometers only)	Fluid mechanics & Hydraulics machines by R.K. Bansal		
3. 11-18	II Fluid Flow	Types of Fluid Flow, Path line and stream line, continuity eqn, Bernoulli's theorem for ideal fluid, principle of operation of venturimeter, orifice meter and pitot tube. Derivation for discharge, coefficient of discharge and simple numerical problems.			
19-27	Flow through pipes	Laminar and turbulent flow; Darcy's eqn and Chezy's eqn. for friction losses, minor losses in pipes,			

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Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5. 28-36	III Impact of jets	Hydraulic gradient and total gradient line, simple numerical problems to estimate losses only. Impact of jet on fixed vertical moving vertical flow plates, impact of jets on curved surfaces with special reference to turbines, simple numerical on work done & efficiency			
6. 37-46	Hydraulic Turbine	Layout of hydroelectric power plant, Features of Hydro electric power plant classification of hydraulic turbines, Selection of turbine on the			

Extra Topics to be covered beyond the scope of the syllabus (as required by industry/ as recommended by Teacher which he/she finds necessary)

Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks

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Date 01/08/2025	HOD Sign <i>[Signature]</i>
Date	Principal Sign <i>[Signature]</i>

Additional sheets (if required).

PLANNED SYLLABUS COVERAGE(Theory)

P ngra LABUS VERAGE	Department: <u>Mechanical Engg</u>		Subject <u>Fluid Mechanics & Hydraulic machinery</u>		
	Course <u>Diploma (ME)</u>		Duration <u>14 weeks</u>		
	Total Periods <u>56</u>		Theory <u>56</u>		
Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
		basis of Head and discharge available, construction & working principle of pelton francis and Kaplan turbines Draft tubes types and construction, concept of cavitation in turbines calculation of work done Power, efficiency of turbines Unit quantities and Simple numericals.	Fluids mechanics & hydraulic machines by S.S. Raktan		
47-50	v Centrifugal Pumps	Principle of working & applications, Types of casing and impellers, concept of multi stage, concept of priming and, cavitation Manometric head, work done monometric efficiency, overall efficiency.	Fluid mechanics & hydraulic machines by R.K. Bansal		
51-56	Reciprocating Pumps	Construction, working principle and application of a single and double			

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		adding reciprocating pumps, Concept of slips, Negative slip Cavitation and separation			

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Additional sheets (if required).

PLANNED SYLLABUS COVERAGE(Theory)

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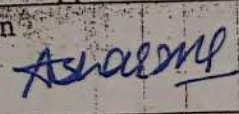
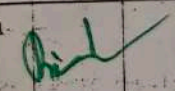
P ngra LABUS VERAGE	Department: <u>Mechanical Engg.</u>		Subject: <u>Advanced Manufacturing Processes</u>		
	Course: <u>Program Core</u>		Duration: <u>14 weeks.</u>		
	Total Periods: <u>56.</u>		Theory: _____		
Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1-14	Jigs & Fixtures	Definition of Jig, Types of Jigs, Leaf Jig, Box & Hand Jig, Template Jig, Plate Jig, Indexing Jig, Universal Jig, Vice Jigs General consideration in the design of jigs, Drill bush, Types of fixtures, Vice fixtures, Milling fixtures, Boring fixtures, Grinding fixtures, Basic principles of location, Locating methods and devices, Basic principles of the clamping, Types of clamps, Strap clamps, Cam clamps, screw clamps, Toggle clamps, Hydraulic & pneumatic clamps.	Production Technology: P. T. McGraw Hill CNC Machine: P. T. McGraw Hill Non Conventional Machining: P. K. Mishra, New Age Publishing House		
15-25	Plastic Processing	Processing of plastic, Moulding process, Injection moulding, Compression moulding, Transfer moulding, Extruding, Casting, Fabrication methods - Sheet forming, Blow moulding, Laminating plastics, reinforcing, Application of plastics			
26-34	Modern Machining Processes	Principle, description & application of ultrasonic machining, Electro discharge machining, Wire cut EDM, Abrasive jet machining, Laser Beam machining, Electrochemical machining			
35-45	CNC Milling Machine	Vertical & Horizontal machining center, Constructional feature, Axis identification, Electronic control system, Tool holder tool			

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Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
46-56	Special purpose machines & Maintenance of Machine tools	<p>Changers tool magazine, CNC programming, preparatory functions, Miscellaneous functions, M codes, Post programming,</p> <p>Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design.</p> <p>Type of Maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records, Housekeeping, Introduction to total productivity maintenance</p>			

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PLANNED SYLLABUS COVERAGE(Theory)

P ngra LABUS VERAGE	Department: <u>Mechanical Engg.</u> Subject <u>OE-1 (vehicular system)</u>				
	Course <u>Diploma</u>		Duration <u>14 weeks</u>		
	Total Periods <u>14x4 = 56</u>		Theory <u>56</u>		
	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended
		Introduction	Types of Automobiles, different layout of vehicle chassis, frame and body, spark ignition (SI) & compression ignition (CI)		
		Automotive Engine parts	Cylinders - arrangements and their relative merits, liners, piston, connecting rod, crankshaft, valve, valve actuating mechanisms.		
		Transmission systems	Clutch type and construction of single plate clutch, propeller shaft, slip joints, universal joints, Differential and rear axle.	Automobile Engg. by K. R. Singh (vol. I & II)	
			Requirements, leaf spring, coil spring, Types of brakes, mech. and hydraulic braking		

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Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
		System, brake shoe away, Disk brakes, Drum brake, Antilock-Braking system, purpose and operation of antilock braking system, passive safety systems- Airbags, seatbelts, crumple zones, active safety system - Automatic Driver assist system, ABS, reverse parking system, Anti collision system - Traction control system - Cruise control system, Heating, ventilation and AC (HVAC), autonomous Driving cars - Level of Driving auto- mation (Basic definition & function only)			

Extra Topics to be covered beyond the scope of the syllabus (as required by industry/ as recommended by Teacher which he/ she finds necessary)

Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks

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Date 01/08/2025	HOD Sign ASHA RANI
Date 01/08/2025	Principal Sign [Signature]

PLANNED SYLLABUS COVERAGE (Theory)

P ngra LABUS VERAGE	Department: <u>Mech. Engg</u> Subject: <u>Elements of R&AC</u>				
	Course: <u>Diploma</u> Duration: <u>14 Weeks</u>				
	Total Periods: <u>56</u> Theory: <u>56</u>				
Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1 to 10	Unit - I Introduction to Refrigeration	Definition of Refrigeration, Refrigerating effect, unit of refrigeration - COP, Carnot refrigeration cycle, Air refrigeration, Bell Coleman cycle, P & T S diagram, Advantages & disadvantages in air refrigeration (simple problems on Carnot refrigeration cycle only)			
11 to 23	Unit - II Refrigeration Systems	Basic components, flow diagram of working of vapour compression cycle, Representation of the vapour compression cycle on P & T S diagram, Expression for refrigerating effect, W.D & Power required, Type of vapour compression cycle, Effects of superheating & subcooling, its advantages & disadvantages, Simple vapour absorption cycle and its flow			

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Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
to 37	Unit -III Refrigeration Equipments:- Refrigerants & Lubricants:-	<p>diagram, comparison of vapour absorption & vapour compression system.</p> <p>Compressor - Hermetically sealed and semi hermetically sealed compressors, Condensers :- Air cooled, natural and forced draft cooling system. Advantages & disadvantages of air cooled and water cooled condensers. Evaporators - natural convection, forced convection types.</p> <p>Introduction to Refrigerants, Properties of good</p>			

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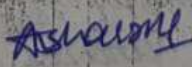

P ngra LABUS VERAGE	Department: <u>Mech. Engg.</u>		Subject <u>Elements of R & AC</u>	
	Course <u>Diploma</u>		Duration <u>14 Weeks</u>	
	Total Periods <u>56</u>		Theory <u>56</u>	
Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended
38 to 46	unit IV:- Refrigerant flow controls:	<p>refrigerants, classification of refrigerants, detection of refrigerants leakage, charging the system with refrigerant, Lubricants used in refrigeration & their properties.</p> <p>capillary tube, Automatic Expansion valve, Thermostatic expansion valve, High side and low side float valve, Solenoid valve, Evaporator pressure regulator.</p> <p>Application of refrigeration slow and quick freezing cold storage & frozen storage, Dairy refrigeration, Ice making Industry, Water cooler.</p>		
47 to 56	unit V:- Air conditioning:-	<p>Introduction to Air conditioning, factors affecting air conditioning, brief description of DBT, WBT, DPT, Psychometric chart and its use, Psychometric</p>		

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Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
		<p>processes - SH & CH, Humidification & dehumidification, cooling & dehumidification, heating & humidification (simple problems on above psychrometric processes only by using Psychrometric chart) Equipment used in Air conditioning cycle.</p> <p>Refrigeration & Tools used in Refrigeration & Air conditioning & Air conditioner Installation, Installation procedure, servicing procedure.</p>			

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Date	Principal Sign 

Additional sheets (if required):

PLANNED SYLLABUS COVERAGE(Theory)

**G P
Kangra**

Department: Mech. Engg. Subject Theory of Machines & M.

Course Diploma Duration 3 Years

**SYLLABUS
COVERAGE**

Total Periods 70 Theory 70

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1.	1-10	Cam and followers	Concept, Definition and application of cams and followers; Classification of cams and followers; Different follower motion and their Displacement Diagrams like Uniform Velocity, SHM, uniform Acc. and Retardation; Drawing of Profile of radial cam with knife edge and roller follower without offset for reciprocating motion (Graphical Method for uniform velocity and SHM only,	Theory of Machine by R.K. Bansal, Lexms publication.		
2.	11-24	Power Transmission	Type of Drives; flat belt, V-belt & its application, 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.		Theory of Machine by S.S. Rattan Tata McGraw Hill - publication	

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
			<p>Condition of Max. power transmission (with diff. eff.)</p> <p>Simple Numerical;</p> <p>Chain drive, advantage and Disadvantage;</p> <p>Gear drive - Spur gear terminology; Type of gears and gear trains</p> <p>Train value and velocity ratio for simple and compound gear trains.</p>			

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Sr. No.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks

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Date 01/08/2025	HOD Sign A. Sharma
Date	Principal Sign P. S.

Use additional sheets (if required)

PLANNED SYLLABUS COVERAGE(Theory)

**G P
Kangra**

Department: Mech. Engg. Subject Theory of Machine & M.

Course Diploma Duration 3 Years..

SYLLABUS COVERAGE

Total Periods 70 Theory 70

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
3.	25-41	Fly Wheel and Governors	Flywheel - Concept, function and application of fly wheel with the help of T.M.D. for Single cylinder 4-stroke I.C Engines; Cof. of fluctuation of energy and speed with its significance; Governor Type and explanation with neat sketch (Centrifugal, Watt and Porter); Concept function & Terminology of Governors; Comparison b/w Fly wheel and Governors;			
4.	42-57	Break Clutch and Bearing	Function of Brakes; Type of Brakes; Comparison b/w Brakes and Dynamometers Construction and Working of Shoe Brake, Band Brake, Disc Brake, Concept of self locking & self energizing Brake. Clutch - Function of clutch and its application; construction and Working of Single plate, Multi plate clutch, Centrifugal clutch, cone clutch, Bearing, Simple pivot, Collar Bearing, conical pivot.			

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Re
5.	58-70	Balancing and vibration	Concept of Balancing; Balancing of single rotating mass; Graphical Method of Balancing of several masses Revolving in same plane; Vibration and its typical Concept of Damping; Cause of vibration in machines; Their harmful effects and Remedies			

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