

-PVC- NSSK G.P. BILASPUR at KALOL		Department :- Mechanical Engg. (5 th Sem.)			Subject- FM&HM(MEPC301)	
SYLLABSE COVERRAGE		Course- Diploma			Duration -3 Years	
		Total Periods – 56 (Lecture-28 + DCS- 28)			Theory-56 (Lecture-28 + DCS- 28)	
Sr no.	Perio d No's	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-12	Properties of fluid Fluid Pressure & Pressure Measurement:	Density, Specific gravity, Specific Weight, Specific Volume, Dynamic Viscosity, Kinematic Viscosity, Surface tension, Capillarity, Vapour Pressure, Compressibility. Fluid pressure, Pressure head, Pressure intensity, Concept of vacuum and gauge pressures, atmospheric pressure, absolute pressure, Simple and differential manometers, Bourdan pressure gauge. (Simple problems on Manometers only).	Fluid Mechanics and Hydraulic Machines- R.K. Bansal	Fluid Mechanics & Hydraulic Machines, S.S. Rattan,	
2	13-23	Fluid Flow Flow Through Pipes:	Types of fluid flows, Path line and Stream line, Continuity equation, Bernoulli's theorem for ideal fluid, Principle of operation of Venturimeter, Orifice meter and Pitot tube, Derivations for discharge, coefficient of discharge and simple numerical problems. Laminar and turbulent flows; Darcy's equation and Chezy's equation for frictional losses (Formula for the above terms without proof), Minor losses in pipes, Hydraulic gradient and total gradient line, Simple Numerical problems to estimate losses only.	-----do-----	-----do-----	
3	24-32	Impact of jets:	Impact of jet on fixed vertical, moving vertical flat plates, Impact of jet on curved vanes with special reference to turbines , Simple Numerical on work done and efficiency.	-----do-----	Hydraulic, fluid mechanics & fluid machines- Ramamrutham S	
4	33-45	Hydraulic Turbines	Layout of hydroelectric power plant, Features of Hydro electric power plant, Classification of hydraulic turbines, Selection of turbine on the basis of head and discharge available, Construction and working principle of Pelton wheel, Francis and Kaplan turbines, Draft tubes types and construction, Concept of cavitation in turbines, Calculation of Work done, Power, efficiency of turbines, Unit quantities (Formula only) and simple numerical.	-----do-----	-----do-----	

Sr no.	Period No's	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5	46-56	Centrifugal Pumps Reciprocating Pumps (Problems omitted):	Principle of working and applications. Types of casings and impellers. Concept of multistage. Concept of Priming and Cavitation. Manometric head. Work done. Manometric efficiency. Overall efficiency. Construction, working principle and applications of single and double acting reciprocating pumps. Concept of Slip. Negative slip, Cavitation and separation.	-----do-----	-----do-----	

[Signature]
03/08/2020

Approved	HOD Sign
Date : 03/08/2020	<i>[Signature]</i>

Branch: Mechanical Engineering Semester: 5th Semester Mechanical Engg. (Diploma)
 Session : 2026 (Aug-Dec, 2026)

Subject : E-Governance

Teacher : Er. Sudhir Sen

Detail of Contents

Teacher : Er. Sudhir Sen				Detail of Contents		Remarks
Chapter	Month	Week	Period	Chapter Discription		
1 & 2	August	2nd	3,6,7	UNIT 1: Understand the different models of E-governance.	Exposure to emerging trends in ICT for development;	
		3rd	10,13,14		Understanding of design and implementation of e-Government projects, e-governance lifecycle.	
		4th	17,20,21,22		Need for Government Process Re-engineering (GPR);	
		5th	24,27,28,29		National e-Governance Plan(NeGP) for India; SMART Governments & Thumb's Rules	
3	September	1st	3,5	UNIT 3: Understand the benefits and reasons for the introduction of e-governance at the local level.	Architecture and models of e-Governance,	
		2nd	7,10,11		Including Public Private Partnership (PPP); ClassTest-1	
		3rd	14,17,18,19		Need for Innovation and Change Management in eGovernance;	
		4th	21,24,25,26		Critical Success Factors; Major issue including corruption,	
		5th	28		resistance for change, e-Security and Cyber laws	
4	October	1st	1,3	UNIT 4: Realize the issues and challenges of e-governance.	Focusing on Indian initiatives and their impact on citizens;	
		2nd	5,8,9		Sharing of case studies to highlight best practices in managing e-Governance projects in Indian context. 2nd Class Test	
		3rd	12,15,16,17		Sharing of case studies to highlight best practices in managing e-Governance projects in Indian context.	
		4th	19,22,23,24		Visits to local e-governance sites(CSC, eSeva, Post Office, Passport Seva Kendra, etc) as part of Tutorials.	
5	November	5th	29,30,31	Unit 5: HOUSE Test	Visits to local e-governance sites(CSC, eSeva, Post Office, Passport Seva Kendra, etc) as part of Tutorials.	
		1st	2,5,6,7		Projects by students in groups – primarily evaluation of various e-governance project	
		2nd	9,12,13			
		3rd	16,19,20,21			
		4th	23,26,27,28			
Revision of Syllabus						
Session Closed on 28.11.2026						

Signature of Teacher

Signature of Head of Institution
 01/08/2026

"PVC" NSSK GOVT POLYTECHNIC BILASPUR
PLANNED THEORY SYLLABUS COVERAGE & LESSON PLAN (SESSION: Aug-Dec 2026)
 Elements of Refrigeration & Air

Subject: Conditioning

Duration: 3 Year Diploma

Total Periods: 64 Hours / 64 Planned Lectures

Branch: Mechanical Engineering

Sem.: 5th Semester

Class
Schedule: 4 Days/Week (Tue, Wed, Thu, Sat)

SR. NO	Date & Day	Period No.	Topic / Unit	Details of Syllabus Coverage	Instruction Reference /	Remarks / Calendar
1	06-Aug-2026 (Thu)	Period 1	Unit-I: Introduction to Refrigeration	Introduction to Refrigeration: Definition, history, fundamental principles & scope of RAC	Refrigeration and Air Conditioning – Sadhu Singh	Commencement of 5th Sem Classes (Calendar)
2	08-Aug-2026 (Sat)	Period 2	Unit-I: Introduction to Refrigeration	Concept of Refrigerating Effect, Unit of Refrigeration (Ton of Refrigeration - TR) & mathematical conversions	Refrigeration and Air Conditioning – C.P. Arora	
3	11-Aug-2026 (Tue)	Period 3	Unit-I: Introduction to Refrigeration	Coefficient of Performance (COP): Definition, Work Input, Heat Extraction & COP calculation principles	Refrigeration and Air Conditioning – S. Domkundwar	
4	12-Aug-2026 (Wed)	Period 4	Unit-I: Introduction to Refrigeration	Refrigeration cycles: Reversed Carnot cycle schematic, working principle & ideal temperature limits	Refrigeration and Air Conditioning – Sadhu Singh	
5	13-Aug-2026 (Thu)	Period 5	Unit-I: Introduction to Refrigeration	Carnot Refrigeration Cycle: P-V and T-S diagrams, thermal efficiency & COP expression derivation	Refrigeration and Air Conditioning – Sadhu Singh	
6	15-Aug-2026 (Sat)	-	HOLIDAY	INDEPENDENCE DAY (National Holiday)	Institute Closed	National Holiday
7	18-Aug-2026 (Tue)	Period 6	Unit-I: Introduction to Refrigeration	Numerical Problems on Carnot Refrigeration Cycle (COP, Power required, Heat removal rate)	Refrigeration and Air Conditioning – S. Domkundwar	
8	19-Aug-2026 (Wed)	Period 7	Unit-I: Introduction to Refrigeration	Air Refrigeration System: Fundamental principles, open vs closed air systems	Refrigeration and Air Conditioning – A.S. Sarao & G.S. Gahi	



9	20-Aug-2026 (Thu)	Period 8	Unit-I: Introduction to Refrigeration	Bell-Coleman Cycle (Reversed Brayton Cycle): System schematic & working principle	Refrigeration and Air Conditioning – A.S. Sarao & G.S. Gabi	-
10	22-Aug-2026 (Sat)	Period 9	Unit-I: Introduction to Refrigeration	Bell-Coleman Cycle representation on P-V Diagram (Isentropic compression, isobaric cooling, isentropic expansion)	Refrigeration and Air Conditioning – C.P. Arora	-
11	25-Aug-2026 (Tue)	Period 10	Unit-I: Introduction to Refrigeration	Bell-Coleman Cycle representation on T-S Diagram & derivation of COP expression	Refrigeration and Air Conditioning – C.P. Arora	-
12	26-Aug-2026 (Wed)	-	Academic Activity	Technical Seminar / Group Discussion / Quiz Contest on Refrigeration Basics	Co-Curricular / Student Activity	Monthly Activity (Calendar Item 7)
13	27-Aug-2026 (Thu)	Period 11	Unit-I: Introduction to Refrigeration	Analysis of Advantages of Air Refrigeration System (Lightweight, eco-friendly, abundant working fluid)	Principles of Refrigeration – Roy J. Dossat	Lesson Plan Review (Week 4) / Unit-I Complete
14	29-Aug-2026 (Sat)	Period 12	Unit-I: Introduction to Refrigeration	Analysis of Disadvantages of Air Refrigeration System (Low COP, high power consumption, bulky components)	Principles of Refrigeration – Roy J. Dossat	-
15	01-Sep-2026 (Tue)	Period 13	Unit-I: Introduction to Refrigeration	Unit-I Review, comparative study of Carnot vs Bell-Coleman cycles & solving numerical problems	Refrigeration and Air Conditioning – Sadhu Singh	-
16	02-Sep-2026 (Wed)	Period 14	Unit-II: Refrigeration Systems	Vapour Compression Refrigeration System (VCRS): Basic layout, operating principle & core components	Refrigeration and Air Conditioning – C.P. Arora	-
17	03-Sep-2026 (Thu)	Period 15	Unit-II: Refrigeration Systems	Flow diagram & working mechanism of Vapour Compression Cycle (Compressor, Condenser, Expansion, Evaporator)	Refrigeration and Air Conditioning – Sadhu Singh	Display of Monthly Attendance
18	05-Sep-2026 (Sat)	Period 16	Unit-II: Refrigeration Systems	Representation of Vapour Compression Cycle on P-H (Pressure-Enthalpy) Diagram	Refrigeration and Air Conditioning – S. Domkundwar	-
19	08-Sep-2026 (Tue)	Period 17	Unit-II: Refrigeration Systems	Representation of Vapour Compression Cycle on T-S (Temperature-Entropy) Diagram	Refrigeration and Air Conditioning – S. Domkundwar	-
20	09-Sep-2026 (Wed)	-	Assessment	1ST CLASS TEST (Unit-I & Part Unit-II)	Centralized / Departmental Assessment	Academic Calendar Item 9 (2nd Week Sep)

21	10-Sep-2026 (Thu)	Period 18	Unit-II: Refrigeration Systems	Mathematical expression for Refrigerating Effect ($q_{ref} - h_1 - h_4$) using enthalpy state points	Refrigeration and Air Conditioning - C.P. Arora	-	
22	12-Sep-2026 (Sat)	Period 19	Unit-II: Refrigeration Systems	Mathematical expression for Compressor Work Done ($W_c = h_2 - h_1$) and power required (P_{req})	Refrigeration and Air Conditioning - C.P. Arora	-	
23	15-Sep-2026 (Tue)	Period 20	Unit-II: Refrigeration Systems	Derivation of COP formula for Vapour Compression Cycle ($COP = (h_1 - h_4)/(h_2 - h_1)$)	Refrigeration and Air Conditioning - C.P. Arora	-	
24	16-Sep-2026 (Wed)	Period 21	Unit-II: Refrigeration Systems	Types of Vapour Compression Cycles: Wet compression vs Dry compression cycles	Principles of Refrigeration - Roy J. Dossat	-	
25	17-Sep-2026 (Thu)	Period 22	Unit-II: Refrigeration Systems	Types of Vapour Compression Cycles: Superheated vapor entering compressor & subcooled liquid leaving condenser	Principles of Refrigeration - Roy J. Dossat	Academic interaction with Principal/HOD	
26	19-Sep-2026 (Sat)	Period 23	Unit-II: Refrigeration Systems	Effects of Superheating: Thermodynamic analysis, impact on compressor work, refrigerating effect, and COP	Refrigeration and Air Conditioning - Sadhu Singh	-	
27	22-Sep-2026 (Tue)	Period 24	Unit-II: Refrigeration Systems	Effects of Sub-cooling: Thermodynamic analysis, impact on refrigerating effect and system performance	Refrigeration and Air Conditioning - Sadhu Singh	-	
28	23-Sep-2026 (Wed)	-	Academic Activity	Technical Debate / Group Discussion / Seminar on VCRS vs VARS Systems	Co-Curricular / Student Activity	Monthly Activity (Calendar Item 7)	
29	24-Sep-2026 (Thu)	Period 25	Unit-II: Refrigeration Systems	Advantages and Disadvantages of Superheating and Sub-cooling in VCRS	Refrigeration and Air Conditioning - Sadhu Singh	Lesson Plan Review (Week 4) / Unit-II	
30	26-Sep-2026 (Sat)	Period 26	Unit-II: Refrigeration Systems	Simple Vapour Absorption Refrigeration System (VARS): Operating principle & flow diagram (Ammonia-Water)	Refrigeration and Air Conditioning - M. Zakria Baig	-	
31	29-Sep-2026 (Tue)	Period 27	Unit-II: Refrigeration Systems	Detailed Comparison of Vapour Absorption System (VARS) and Vapour Compression System (VCRS)	Refrigeration and Air Conditioning - M. Zakria Baig	-	
32	30-Sep-2026 (Wed)	Period 28	Unit-III: Equipments & Refrigerants	Refrigeration Compressors: Classification, role, and operational principles	Refrigeration and Air Conditioning - Sadhu Singh	-	

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33	01-Oct-2026 (Thu)	Period 29	Unit-III: Equipments & Refrigerants	Hermetically Sealed Compressors: Design features, construction, working, advantages and disadvantages	Refrigeration and Air Conditioning – Sadhu Singh	-
34	03-Oct-2026 (Sat)	Period 30	Unit-III: Equipments & Refrigerants	Semi-Hermetically Sealed Compressors: Design features, maintenance aspects, and industrial applications	Refrigeration and Air Conditioning – S. Domkundwar	Display of Monthly Attendance
35	06-Oct-2026 (Tue)	Period 31	Unit-III: Equipments & Refrigerants	Condensers: Function, heat rejection mechanism, Air-Cooled Condensers (Natural & Forced convection)	Principles of Refrigeration – Roy J. Dossat	-
36	07-Oct-2026 (Wed)	Period 32	Unit-III: Equipments & Refrigerants	Water-Cooled Condensers: Double tube, Shell & Tube, Shell & Coil types, Natural and Forced draught cooling systems	Principles of Refrigeration – Roy J. Dossat	-
37	08-Oct-2026 (Thu)	Period 33	Unit-III: Equipments & Refrigerants	Comprehensive Comparison: Advantages and Disadvantages of Air-Cooled vs Water-Cooled Condensers	Refrigeration and Air Conditioning – C.P. Arora	-
38	10-Oct-2026 (Sat)	Period 34	Unit-III: Equipments & Refrigerants	Evaporators: Functions, heat absorption principle, classification (Natural Convection vs Forced Convection types)	Refrigeration and Air Conditioning – C.P. Arora	-
39	13-Oct-2026 (Tue)	Period 35	Unit-III: Equipments & Refrigerants	Introduction to Refrigerants: Definition, historical development, phase-out of ODS (CFCs/HCFCs) and eco-friendly alternatives	Refrigeration and Air Conditioning – Sadhu Singh	-
40	14-Oct-2026 (Wed)	-	Assessment	2ND CLASS TEST (Unit-II & Unit-III)	Centralized / Departmental Assessment	Academic Calendar Item 11 (2nd Week Oct)
41	15-Oct-2026 (Thu)	Period 36	Unit-III: Equipments & Refrigerants	Desirable Properties of Good Refrigerants: Thermodynamic, chemical, physical, and safety/environmental properties	Refrigeration and Air Conditioning – Sadhu Singh	Exam Form Deadline (Item 12 - 15.10.2026)
42	17-Oct-2026 (Sat)	Period 37	Unit-III: Equipments & Refrigerants	Classification of Refrigerants: Primary (Halo-carbons, Azeotropes, Inorganic, Hydrocarbons) and Secondary refrigerants	Refrigeration and Air Conditioning – M. Zakria Baig	-
43	20-Oct-2026 (Tue)	Period 38	Unit-III: Equipments & Refrigerants	Detection of Refrigerant Leakage: Halide torch, Electronic leak detectors, Soap solution, and Chemical methods	Refrigeration and Air Conditioning – A.S. Sarao & G.S. Gadi	-
44	21-Oct-2026 (Wed)	Period 39	Unit-III: Equipments & Refrigerants	Charging the System with Refrigerant: Evacuation, pressure testing, vapor charging, and liquid charging procedures	Refrigeration and Air Conditioning – A.S. Sarao & G.S. Gadi	-



45	22-Oct-2026 (Thu)	Period 40	Unit-III: Equipments & Refrigerants	Lubricants used in Refrigeration: Selection criteria, required chemical & physical properties (viscosity, pour point, dielectric	Principles of Refrigeration – Roy J Dassat	Academic Interaction with Principal/HOD
46	24-Oct-2026 (Sat)	Period 41	Unit-IV: Flow Controls & Applications	Refrigerant Flow Controls: Purpose, classification, Capillary tube design and operating principle	Refrigeration and Air Conditioning – Sadhu Singh	Lesson Plan Review (Week 4)
47	27-Oct-2026 (Tue)	Period 42	Unit-IV: Flow Controls & Applications	Automatic Expansion Valve (AEV): Construction, working mechanism, pressure balance equation, applications	Refrigeration and Air Conditioning – Sadhu Singh	-
48	28-Oct-2026 (Wed)	-	Academic Activity	Technical Quiz Contest / Poster Presentation on Eco-Friendly Refrigerants	Co-Curricular / Student Activity	Monthly Activity (Calendar Item 7)
49	29-Oct-2026 (Thu)	Period 43	Unit-IV: Flow Controls & Applications	Thermostatic Expansion Valve (TEV): Construction, working mechanism, superheat setting, applications	Refrigeration and Air Conditioning – S. Domkundwar	Unit-III Complete (13 Hrs)
50	31-Oct-2026 (Sat)	Period 44	Unit-IV: Flow Controls & Applications	High Side Float Valve & Low Side Float Valve: Operating principles, construction, and applications	Refrigeration and Air Conditioning – S. Domkundwar	Mid Sem Internal Assessment Display (Calendar
51	03-Nov-2026 (Tue)	Period 45	Unit-IV: Flow Controls & Applications	Solenoid Valve & Evaporator Pressure Regulator (EPR): Working principles and capacity control function	Principles of Refrigeration – Roy J. Dassat	-
52	04-Nov-2026 (Wed)	-	Examination	CENTRALIZED HOUSE TEST (Full Syllabus Assessment)	Centralized Board Assessment	Academic Calendar Item 15 (1st Week Nov)
53	05-Nov-2026 (Thu)	Period 46	Unit-IV: Flow Controls & Applications	Applications of Refrigeration: Principles of Slow Freezing and Quick Freezing mechanisms	Refrigeration and Air Conditioning – C.P. Arora	Display of Monthly Attendance
54	07-Nov-2026 (Sat)	Period 47	Unit-IV: Flow Controls & Applications	Cold Storage & Frozen Storage Plants: Layout, design considerations, temperature & humidity requirements	Refrigeration and Air Conditioning – C.P. Arora	-
55	10-Nov-2026 (Tue)	-	HOLIDAY	DIWALI VACATIONS (As notified by DTE)	Institute Closed	Academic Calendar Item 17 (3 Days)
56	11-Nov-2026 (Wed)	-	HOLIDAY	DIWALI VACATIONS (As notified by DTE)	Institute Closed	Academic Calendar Item 17 (3 Days)

57	12 Nov 2026 (Thu)	Period 48	Unit-IV: Flow Controls & Applications	Dairy Refrigeration: Milk chilling, pasteurization, cooling, storage requirements and system layout	Refrigeration and Air Conditioning - M Jadhav Ragh	Parent Teacher Meeting Week (Calendar term)
58	14 Nov 2026 (Sat)	Period 49	Unit-IV: Flow Controls & Applications	Ice Making Industry Ice Plant layout, brine tank systems & distal controls (Storage in instantaneous type)	Refrigeration and Air Conditioning - M Jadhav Ragh	End of Semester 2026
59	15 Nov 2026 (Sun)	Period 50	Unit-V: Air Conditioning & Tools	Introduction to Air Conditioning: Definition, comfort conditioning vs industrial conditioning, human comfort factors	Refrigeration and Air Conditioning - M Jadhav Ragh	
60	18 Nov 2026 (Wed)	Period 51	Unit-V: Air Conditioning & Tools	Factors affecting Air Conditioning: Temperature, Humidity, Air Motion, Air Purity, Odor control	Refrigeration and Air Conditioning - M Jadhav Ragh	
61	19 Nov 2026 (Thu)	Period 52	Unit-V: Air Conditioning & Tools	Psychrometric Definitions: Dry Bulb Temperature (DBT), Wet Bulb Temperature (WBT), Dew Point Temperature (DPT)	Refrigeration and Air Conditioning - M Anura	Academic Interaction with Principles/HOD
62	21 Nov 2026 (Sat)	Period 53	Unit-V: Air Conditioning & Tools	Psychrometric Definitions: Relative Humidity, Specific Humidity (Humidity Ratio), Enthalpy, Specific Volume	Refrigeration and Air Conditioning - M Anura	
63	24 Nov 2026 (Tue)	Period 54	Unit-V: Air Conditioning & Tools	Psychrometric Chart: Understanding structure, property lines, and chart navigation	Refrigeration and Air Conditioning - M Dharmadwar	Rationalization Committee visit (Calendar term)
64	25 Nov 2026 (Wed)	Period 55	Unit-V: Air Conditioning & Tools	Psychrometric Processes: Sensible Heating and Sensible Cooling processes & representation on chart	Refrigeration and Air Conditioning - M Dharmadwar	
65	26 Nov 2026 (Thu)	Period 56	Unit-V: Air Conditioning & Tools	Psychrometric Processes: Humidification and Dehumidification processes & representation on chart	Refrigeration and Air Conditioning - M Dharmadwar	Lesson Plan Review (Week 4)
66	28 Nov 2026 (Sat)	Period 57	Unit-V: Air Conditioning & Tools	Psychrometric Processes: Cooling and Dehumidification process & representation on chart	Refrigeration and Air Conditioning - M Jadhav Ragh	End of Semester Exams (Week 4) (Term 1) Unit 2

Prepared By: Faculty In Charge
Department of Mechanical Engineering

Checked & Approved By: HOD / IOC
01/03/2026

"PVCNSSK" G.P BILASPUR AT KALOL (H.P)

PLANNED SYLLABUS COVERAGE



Department: Mechanical Engg. Subject – Advance Manufacturing Processes.

Duration – 3 Years

Course - Diploma

Theory –56 hours

SYLLABUS COVERAGE

Sr No	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-14	Jigs & Fixtures	Definition of jig: Types of jigs: Leaf jig, Box and Handle jig, Template jig, Plate jig, Indexing jig, Universal jig, Vice jigs; General consideration in the design of drill 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 and Pneumatic clamps.	Production Technology, Tata Mc-Graw Hill	Production Technology, Tata Mc-Graw Hill	
2.	15-23	Plastic Processing	Processing of plastics; Moulding processes: Injection moulding, Compression moulding, transfer moulding; Extruding; Casting; Fabrication methods-Sheet forming, Blow moulding. Laminating plastics(sheets, rods & tubes), Reinforcing; Applications of Plastics.	Advanced manufacturing technology- David L. Goetsch		
3	24-34	Modern Machining Processes	Principle, Description and applications of Ultrasonic Machining, Electric Discharge Machining, Wire cut EDM, Abrasive Jet Machining, Laser Beam Machining, Electro Chemical Machining.	Non conventional Machining - P.K. Mishra		

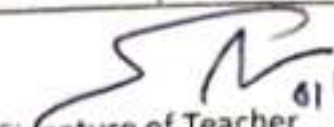
SYLLABUS COVERAGE		Total Periods:56		Theory:56		
Sr No	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
4	35-45	CNC Milling Machines	Vertical and horizontal machining center: Constructional features, Axis identification, Electronic control system. Automatic tool changer and tool magazine. CNC programming: Preparatory functions (G code) , miscellaneous functions (M code), Part programming.	CNC machines- Pabla B.S. & M. Adithan.	Exploring Advanced Manufacturing Technologies- Stephen F.Krar & Arthur Gil	
5	46-56	Special Purpose Machines (SPM):	Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design. Maintenance of Machine Tools: Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records, Housekeeping. Introduction to Total Productive Maintenance (TPM)	Manufacturing Technologies- Stephen F.Krar & Arthur Gil		


Subject Teacher.

APPROVED	SIGN HOD
DATE :- 01/08/2026	

"PVC" NSSK GOVT POLYTECHNIC BILASPUR
PLANNED THEORY SYLLABUS COVERAGE

Department: Mechanical Engg.				Subject: THEORY OF MACHINES & MECHANISMS. (MEPC305)		
Sem. & Branch: 5TH / Mech. Engg.				Duration: 3 Year		
Teacher: Suresh Kumar						
Syllabus coverage		Total periods:-70 (L: 3, DCS:2, P:0 /week)			Practical : NO	
SR. NO	Period/Hrs	Topic/Unit	Details	Instruction Reference	Additional study	Remarks
1	14	Cams and Followers	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; 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).	1. Theory of machines-R.S. Khurmi & J.K.Gupta, S.Chand publications.	1. Theory of machines-R.K. Bansal, Laxmi publications. 2. Theory of machines-S.S.Rattan, Tata McGraw-Hill publications. 3. Dynamics of Machines-JBK Das, Sapna Publications. 4. Theory of machines-Jagdish Lal, Bombay Metro-Politan book Ltd.	
2	17	Power Transmission	Types of Drives: 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 (Formula without proof) (Simple numerical); Chain Drives-Advantages & Disadvantages;; Gear Drives - Spur gear terminology; Types of gears and gear trains; Train value & Velocity ratio for simple and compound gear train.			
3	17	Wind Energy	Flywheel - Concept, function and application of flywheel with the help of turning moment diagram for single cylinder 4-Stroke I.C. Engine; Co-efficient of fluctuation of energy, Coefficient of fluctuation of speed and its significance; Governors-Types and explanation with neat sketches (Centrifugal, Watt and Porter); Concept, function & Terminology of Governors; Comparison between Flywheel and Governor.			
4	18	Brakes, Clutches & Bearings	Function of brakes; Types of brakes; Comparison between brakes and dynamometers; Construction and working of i) shoe brake, ii) Band Brake, iii) Disc Brake; Concept of Self Locking & Self energizing brakes; Clutches- Function of Clutch and its application; Construction and working of i) Single plate clutch, ii) Multi plate clutch, iii) Centrifugal Clutch and iv) Cone clutch; Bearings - i) Simple Pivot, ii) Collar Bearing, iii) Conical pivot.			
5	14	Balancing & Vibrations	Concept of balancing; Balancing of single rotating mass; Graphical method for balancing of several masses revolving in same plane; Vibrations, its type and concept of damping; Causes of vibrations in machines; their harmful effects and remedies.			

Signature of Teacher  01/08/26

Approved	Sign HOD/OC
	 01/08/26