PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra	Department: Mechanical Engineering	Subject :BOM &ED			
	Course - Diploma	Duration – 14 weeks			
SYLLABUS	Total Periods - 56	Theory – 56 hours			

Sr.No	Period Nos	Topic	Details	Instruction references	Additional Study Recommended	Remarks
1	1 TO 5	1. Introduction to Management	1.1 Definitions and concept of Management 1.2 Functions of management- planning, organizing, staffing, coordinating and controlling. 1.3 Various areas of management 1.4 Structure of an Organization	Generic Skill Development Manual, MSBTE, Mumbai	Entrepreneurship Development by S. L. Gupta and Arun Mittal: IBH Publication	
2	6 TO 13	2. Self-Management and Development	2.1 Life Long Learning Skills, Concept of Personality Development, Ethics and Moral values 2.2 Concept of Physical Development; Significance of health, hygiene, body gestures 2.3 Time Management Concept and its importance 2.4 Intellectual Development: Reading skills, speaking, listening skills, writing skills (Note taking, rough draft, revision, editing and final drafting), Concept of Critical Thinking and Problem Solving (approaches, steps and cases). 2.5 Psychological Management: stress, emotions, anxiety and techniques to manage these. 2.6 ICT & Presentation skills; use of IT tools for good and impressive presentations.			
3	14 TO 21	3. Team Management	3.1 Concept of Team Dynamics. Team related skills, managing cultural, social and ethnic diversity in a team. 3.2 Effective group communication and conversations. 3.3 Team building and its various stages like forming, storming, norming, performing and adjourning 3.4 Leadership, Qualities of a good leader 3.5 Motivation, Need of Motivation, Maslow's theory of Motivation			
4	22 TO 26	4. Project Management	4.1 Stages of Project Management; initiation, planning, execution, closing and review (through case studies), SWOT analysis concept.			
5	27 TO 36	5. Introduction to Entrepreneurship	5.1 Entrepreneurship, Need of entrepreneurship, and its concept, Qualities of a good entrepreneur 5.2 Business ownerships and its features; sole proprietorship, partnership, joint stock companies, cooperative, private limited, public limited, PPP mode 5.3 Types of industries: micro, small, medium and large			
6	37 TO 42	6. Entrepreneurial Support System (Features and Roles in Brief)				

Sr.No	Period Nos	Topic	Details	Instruction references	Additional Study Recommended	Remarks
			6.1 District Industry Centers (DICs), State Financial Corporations (SFCs), NABARD, 6.2 MSME (Micro, Small, Medium Enterprises) – its objectives & list of schemes			
7	43 TO 49	7. Market Study and Opportunity Identification	Types of market study: primary and secondary, product or service identification, assessment of demand and supply, types of survey and their important features			
8	50 TO 56	8. Project Report Preparation	8.1 Preliminary Report, Techno-Economic Feasibility Report, Detailed Project Report (DPR)			

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PLANNED SYLLABUS COVERAGE (THEORY)

G P Kangra	Department: Mechanical Engg. –Subject-Thermal Engineering II				
	Course Diploma- Duration: 3 Years				
SYLLABUS COVERAGE	Total Periods : 56 Theory : 56				
Sr No	Period No.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1 – 10	**Power Cycles**	1.1 Concept of reversibility, Carnot cycle. 1.2 Rankine cycle and its efficiency. 1.3 Brayton cycle. 1.4 Otto, Diesel and Dual Combustion cycle.	Engineering Thermodynamics by P.K. Nag		
2	11-18	**Principles of I.C. Engines**	2.1 Introduction and classification of I.C. Engines. 2.2 Working principle of two strokes and four strokes cycle by representing on PV and valve timing diagrams. 2.3 Petrol and diesel engines, their comparison and applications. 2.4 Concept of IC engine terms: Bore, stroke, dead centres, crank throw, compression ratio, clearance volume, piston displacement and piston speed. Familiarity with ISI specification for I.C. engine parts.	R.S Khurmi, Eagle Publication.		
3	19-25	**Carburation and Ignition Systems of Petrol Engine**	3.1 Concept of carburetion. 3.2 Air fuel ratio. 3.3 Simple carburetor and its limitations. 3.4 Description of a battery coil and magneto ignitions system.	B.S. Ubhi.		
4	26-32	**Fuel System in Diesel Engines**	4.1 Components of Fuel system. 4.2 Description and working of fuel feed pump. 4.3 Fuel injection pump. 4.4 Injector. 4.5 Multi Point Fuel Injection Systems.			

Sr No	Period No	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5	33-37	**Cooling and Lubrication**	5.1 Necessity of Engine Cooling. 5.2 Cooling systems: their main features. 5.3 Thermostat. 5.4 Defects in cooling system and their rectification. 5.5 Function of lubrication. 5.6 Types and properties of Engine lubricants. 5.7 Lubrication systems of I.C. engine. 5.8 ISI specification and brand names of Engine lubricants. 5.9 Fault in cooling and lubrication system and their remedial actions.	Engineering Thermodynamics by P.K. Nag R.S Khurmi,		
6	38-49	**I.C. Engine Testing**	6.1 Engine power - indicated and Brake power. 6.2 Efficiency - Mechanical, Thermal, Relative and volumetric. 6.3 Methods of finding indicated and brake power. 6.4 Morse Test. 6.5 Heat balance sheet.	Eagle Publication, B.S. Ubhi.		
7	50-56	**Air Compressors**	7.1 Industrial uses of compressed air. 7.2 Classification - description of reciprocating and Rotary air compressors 7.3 Fans, Blowers and supercharger. 7.4 Working principle of reciprocating single and two stage compressors. 7.5 Inter-cooling, volumetric efficiency. 7.6 Operation and Maintenance of reciprocating compressors.			

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GP Kangra	Department: **Mechanical Engineering**	Subject: **Machine Design**	
	Course: **Diploma**	Duration : **03 Years**	
Syllabus Planned	Total Periods: 70(T)	Theory: 70	

SYLLABUS PLANNED

S. N.	Period No.	Topic	Details	Instruction Reference	Additional Study recommended	Remarks
1.	1-10	Introduction	1.1 Design – Definition, Type of design, necessity of design 1.1.1 Comparison of designed and un-designed work 1.1.2 Design procedure 1.1.3 Characteristics of a good designer 1.2 Design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress concentration, fatigue, endurance limit. 1.2.1 General design consideration 1.2.2. Codes and Standards (BIS standards) 1.3 Engineering materials and their mechanical properties 1.3.1 Properties of engineering materials: elasticity, plasticity, malleability, ductility, toughness, hardness and resilience. Fatigue, creep, tenacity, strength 1.3.2 Selection of materials, criterion for material selection	Machine Design by V.B.Bhandari, Tata McGraw Hill, New Delhi Machine Design by R.S. Khurmi and JK Gupta, Eurasia Publishing House (Pvt.) Limited, New Delhi		
2.	11-16	Design Failure	2.1 Various design failure theories-maximum stress theory, maximum strain theory 2.2 Classification of loads 2.3 Design under tensile, compressive and torsional loads			
3.	17-24	Design of Shafts	3.1 Type of shafts, shaft materials, Type of loading on shafts, standard sizes of shafts available 3.2 Shafts subjected to torsion only, determination of shaft diameter (hollow and solid shaft) on the basis of - Strength criterion - Rigidity criterion 3.3 Determination of shaft diameter (hollow and solid shaft) subjected to bending 3.4 Determination of shaft diameter (hollow and solid shaft) subjected to combined torsion and bending.			

S. N.	Period No.	Topic	Details	Instruction Reference	Additional Study recommended	Remarks
4.	25-35	Design of Keys	4.1 Types of keys, materials of keys, functions of keys 4.2 Failure of keys (by Shearing and Crushing) 4.3 Design of keys (Determination of key dimension) 4.4 Effect of keyways on shaft strength			
5.	36-56	Design of Joints	Types of joints - Temporary and permanent joints, utility of various joints 5.1 Temporary Joint 5.1.1 Knuckle Joints – Different parts of the joint, material used for the joint, type of knuckle Joint, design of the knuckle joint 5.1.2 Cotter Joint – Different parts of the spigot and socket joints, Design of spigot and socket joint 5.2 Permanent Joint 5.2.1 Welded Joint - Welding symbols. Type of welded joint, strength of parallel and transverse fillet welds 5.2.2 Strength of combined parallel and transverse weld 5.2.3 Riveted Joints: Rivet materials, Rivet heads, leak proofing of riveted joint – caulking and fullering 5.2.4 Different modes of rivet joint failure 5.2.5 Design of riveted joint – Lap and butt, single and multi-riveted joint			
6.	57-64	Design of Flange Coupling	Necessity of a coupling, advantages of a coupling, types of couplings, design of muff coupling, design of flange coupling (both protected type and unprotected type).			
7.	65-70	Design of Screwed Joints	7.1 Introduction, Advantages and Disadvantages of screw joints, location of screw joints 7.2 Important terms used in screw threads, designation of screw threads 7.3 Initial stresses due to screw up forces, stresses due to combined forces 7.4 Design of bolts for cylinder cover			

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GOVT. POLYTECHNIC KANGRA

PTSC-7.1

PLANNED THEORY SYLLABUS COVERAGE

GPK | **Department: Mechanical Engineering** | **Subject: Manufacturing Technology-III**

Sem. & Branch : 5th Mechanical Engineering **Duration : 14 weeks**

SYLLABUS COVERAGE **Total Periods** **Theory : 42 Practical : 84**

Sr No	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
	1		Introduction to Manufacturing Technology-III. Syllabus overview and evaluation scheme	Elements of workshop technology by SK Chaudhry and Hajra. Asia Publishing House	Production Technology by HMT. Tata McGraw Publishers. New Delhi	
1.	2-12	Milling	Introduction to milling. Types of milling Machines Constructional features of Knee and Column type milling machine. Specifications of milling machine Milling operations- plain. angular. form. straddle and gang milling Milling cutters - Geometry and types. Cutting speed and feeds. Indexing-simple. compound. differential and angular. Job holding devices. Introduction to machining centre			
2.	13-19	Presses and Press Tools	Types of Presses. their applications. Types of dies. Types of die sets. Punches. Pads. Die clearance. Stripper plates. Stops. Pilots. Stock Layout	Workshop Technology Vol I. II & III by Chapman: Standard Publishers		
3.	20-25	Broaching	Introduction . Types of broaching machines. Types of broaches and their use			
4.	26-30	Metal Coating Processes	Metal spraying. Galvanizing. Electroplating. Anodizing			

Sr No	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5.	31-35	Gear Generating and Finishing Processes	Gear tooth elements. Gear milling. Introduction to gear shaping. Working principle of gear shaping machine. Working principle of gear hobbling machine Introduction to gear finishing operations	Elements of workshop technology by SK Chaudhry and Hajra. Asia Publishing House	Production Technology by HMT. Tata McGraw Publishers. New Delhi	
6.	36-42	Advanced Welding Techniques	Working principle. process details. equipment details. Advantages. Limitations and applications of: Thermit Welding. MIG Welding. TIG Welding. Atomic Hydrogen. Welding. Electron beam welding. Laser beam welding. Introduction to friction welding	Workshop Technology Vol I. II & III by Chapman: Standard Publishers		

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PLANNED SYLLABUS COVERAGE (THEORY)

G P Kangra	Department: Mechanical Engg. Subject : Welding Technology					
	Course Diploma- Duration: 3 Years					
SYLLABUS COVERAGE	Total Periods : 56 Theory : 56					
Sr No	Period No.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-6	Principle of welding	1.2Classification of welding processes1.3Advantages, Limitations of welding.1.4Welding applications1.5 Weld ability	Welding Technology by O.P. Khanna	Manufacturing Technology. Vol. 1 - Foundry, Forming and Welding by P.N.Rao	
2	7-15	Gas Welding	2.1Principle of operation Oxyacetylene flame2.2.1Types of flame 2.2.2 Combustion of flame 2.3 Welding Techniques 2.4 Filler rods And fluxes for gas welding 2.5Gas welding equipment and accessories 2.5.1 Oxygen gas cylinders 2.5.2 Acetylene gas cylinders 2.5.3 Acetylene gas generator 2.5.4 Pressure Regulator 2.5.5Oxygen and Acetylene Hoses 2.5.6 Welding Torch			
3	16-23	Arc Welding	3.1Arc welding process3.2 Striking the arc 3.3Are length 3.4 Are blow 3.5 Arc welding machines- types and details 3.6 Selection of welding machines 3.7 AC and DC welding and effects of polarity 3.8 Electrodes-classification, specifications and selection 3.9Coated electrodes 3.10 Welding positions 3.11 Welding procedures 3.12 Welding defects			
4	24-29	Resistance Welding	4.1Principle 4.2 Advantages, disadvantages 4.3 Applications 4.4 Spot welding 4.5 Seam welding 4.6 Projection welding 4.7 Butt Welding 4.7.1 Upset butt welding 4.7.2 Flash butt welding 4.8Percussion welding			

5	30-35	Other Welding Processes	5.1 Submerged arc welding 5.2 TIG welding 5.3 MIG welding 5.4 Electro slag welding 5.5Plasma are welding 5.6Ultrasonic welding 5.7Thermit welding			
6	36-41	Brazing	6.1Principle 6.2Procedure 6.3 Brazing filler alloys 6 4 Brazing fluxes 6.5 Advantages, Limitations and applications			
7	42-46	Soldering	7.1 Principle 7.2 Solders7.3Soldering fluxes 7.4Soldering Methods 7.5 PCB Soldering			
8	45-50	Welding Of Different Materials	8.1 Welding Cast iron, Alloy Steel, tool Steel, Aluminium, Magnesium, Stainless, Copper			
9	51-56	Weld Defects And Testing	9.1Types of weld Defects; their causes and prevention. 9.2 Destructive testing of welds 9.3 Non Destructive tests- Fluorescent penetration test, magnetic particle test, ultrasonic test, radiographic test			

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