

MECHANICAL ENGINEERING DIPLOMA

TURNING WORKSHOP ME LAB-I

1.	Job on facing & Turning	Available	Centre Lathe by LSN Gupta Self.	A-29-8-26 A -	B-5-9-26 B -	C-14-9-26 C -
2.	Job on step turning and Grooving on job number - 1	do	do	A-29-8-26 A -	B-5-9-26 B -	C-14-9-26 C -
3.	Job on taper turning and chamfering, knurling on job number - 1	do	do	A-31-8-26 A -	B-7-9-26 B -	C-16-9-26 C -
4.	Job on internal turning and Threading on job number - 1	do	do	A-31-8-26 A -	B-7-9-26 B -	C-19-9-26 C -
5.	Job on marking and drilling practice on mild steel round pieces.	do	do	A-21-9-26 A -	B-28-9-26 B -	C-5-10-26 C -

Shammy

2-1

Practical Planning & Coverage Status

Department: MECHANICAL ENGINEERING

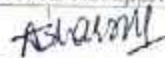
Laboratory: MACHINE W/SHOP

Course: DIPLOMA

Subject: ME LAB-I

Sr. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsible y	HOD Sign.	Remark
		Equipment Set up	STD Ref. Write up					
1.	Shaping a hexagon on round bar, keyway & groove	Available	Wang/Shop Technology	A24/08/16 B 03/08/16 C 04/08/16				
2.	Shaping step blank cut down tail to angle 60/90/120°	— Do —	by B.S	A24/08/16 B 05/08/16 C 17/08/16				
3.	Simple planing Exercise	— Do —	Phonograph Publication & Wang/Shop Technology by Eason Design	A24/08/16 B 10/08/16 C 19/08/16				
4.	Grinding the lathe cutting tool to required Angle.	— Do —	Wang/Shop Technology by Eason Design	A24/08/16 B 29/08/16 C 05/09/16				
5.	Study of lathe, Drilling M/C, Shaping M/C & Slotting M/C.	— Do —	Eaton Book & Self Instructions	A 05/10/16 B 21/09/16 C 20/09/16				

Approved/Not approved


 HOD Sign with date


 Principal Signature with date

Job	Practicals	Availability of		Date	Remarks
		Equipment Set up	Std. Write up		
6.	Job on boring and reaming on job number - 5	Available	Self - 9 Control Led by LSN GUPTHA	A-14-10-26 B-21-10-26 C-31-10-26	A- B- C-
7.	Study of lathe, drilling m/c	- d. -	- J. -	A-5-8-26 B-12-8-26 C-22-8-26	A-5-8-26 B- C- 

Task	Description of Task	Submittals		Labels (if applicable)	Assessment	Date	Status
		Equipment Setup	Std. Version				
6.	Disassemble some of component of lathe M/C & assemble the same.	Available		A 31/10/16 B 14/10/16 C 01/11/16			

PLANNED SYLLABUS COVERAGE (Theory)

G.P.
Kangra
SYLLABUS
COVERAGE

Department: Mechanical Engg. Subject: Metrology & Measurements

Course: Diploma (Mechanical) Duration: 14 weeks

Total Periods: 56 Hours Theory: 56 Hours

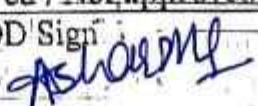
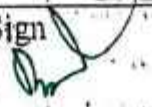
Period No.	Topic	Details	Instruction Reference	Additional Stud. Recommendation
1-7	Introduction to measurement	Definition of measurements significance of measurements methods of measurements; direct & indirect, Generalized measuring system: Standard of measurement Primary & secondary factors influencing selection of measuring instruments, Terms applicable to measuring instruments, Precision accuracy, sensitivity and repeatability, range, Threshold, Hysteresis calibration, Error in measurement classification of errors, systematic and random errors.	Engineering metrology by R.K. Jain	
2. 8-16	Measuring Instruments	Introduction, Thread measurement Thread gauge micrometer, Angle measurement: Bevel Protractor, sine bar, gauge: Plain plug gauge, ring gauge, snap gauge, limit gauge, comparators characteristics of comparators types of comparators, Surface finish, Refinement, Terminology of surface finish, Tally surf, surface Roughness Tester, Coordinating measuring machine.	A. K. Salbany	
3. 17-25	Transducers & Strain gauges	Intruducers, Transducers characteristics, classification of transducers, strain measurement strain gauge, classification.		

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

			Instruction Reference	Additional Study Recommended	Remarks
4.	26-29	measurements of force, torque and pressure	mounting of strain gauges. Introduction: Force measurement Spring Balance, Load cell, torque measurement: Prony brake, Eddy current, Fly wheel dynamometer Pressure measurement, McLeod gauge.		
5.	30-34	Applied Mechanical Measurements	Speed measurement: classification of tachometers, Revolution counters Eddy current tachometers; displacement measurement: Linear variable Differential transformers, flow measurements, Rotometers Turbine meter, Temperature measurement. Resistance thermometer optical pyrometer humidity measurements: Hair Hygrometer; Density measurements Hydrometer. Liquid level		
6.	35-36	Miscellaneous measurements			

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

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

Approved / Not approved	
Date 01/08/26	HOD Sign 
Date	Principal Sign 

PLANNED SYLLABUS COVERAGE(Theory)

GP
Kangra
SYLLABUS
COVERAGE

Department: Mechanical Engg. Subject: Metrology & Measurements
Course: Diploma (Mechanical) Duration: 14 weeks

Total Periods: 56 Hours Theory: 56 Hours

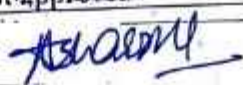
Sl. No.	Period No.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
7.	36-43	Limit, Fits & Tolerances	Measurement, Sight glass float gauge. Concept of limits, fits & Tolerances. Selective Assembly Interchangeability rules & shaft-hole system Taylor's Principle. Angular Measurements: Concept of Instruments for Angular Measurements: working & use of Universal Bevel Protractor, sine bar, spirit level: Principle of working of linometers: Angle gauge	Engineering metrology by R.K. Jain		
8.	44-51	Screw Thread measurements	ISO grade and fit of threads Error in threads, measurement of different elements such as major diameter, minor diameter, effective diameter, pitch, two wire method Thread gauge micrometer, working principle of floating carriage dial micrometer.	Instrumentation & measurement by A.R. Sowray		
9.	52-56	Gear measurement and Testing	Analytical and functional inspection, Rolling Test. Measurement of tooth thickness, chordal addendum, errors in gear such as backlash runout composite			

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

Machine tool Testing:-
Parallelism straightness
to axiality, roundness, runout
alignment testing of
machine tools as per IS
standard procedure.

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

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

Approved / Not approved	
Date 01/08/2026	HOD Sign 
Date	Principal Sign 

Practical Planning & Coverage Status

Department: Mechanical Engineering
Course: Diploma (ME)

Laboratory: Metrology & Instrumentation Lab
Subject: Metrology & measurement lab

Sl. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
1.	Measurement the diameter of a wire using micrometer and compare the result with digital micrometer.	Micrometer	Engineering Metrology by R.K. Salm	G1 09/08/2026 G2 06/08/2026	G1 G2			
2.	Measure the angle of the mechanical surface using sine bar with slip gauge.	Sine bar, slip gauge, surface plate	Mechanical measurements on universal instrument control by A.K. Sawhney	G1 27/08/2026 G2 24/08/2026	G1 G2			
3.	Measure the angle of a v. block/shank of Drill/Bore tool using universal Bevel protractor	Universal Bevel protractor		G1 35/08/2026 G2 27/08/2026	G1 G2			
4.	Measure the dimensions of ground ms. flat/cylindrical bush using vernier caliper compare with digital/Dial vernier caliper	Vernier caliper		G1 8/09/2026 G2 03/09/2026	G1 G2			
5.	Measure the geometrical dimensions of V-Threads using thread vernier gauge.	Thread vernier gauge		G1 25/09/2026 G2 17/09/2026	G1 G2			
6.	Measure the thickness of ground plates using slip gauge.	Set up slip gauges		G1 29/09/2026 G2 24/09/2026	G1 G2			
7.	Measure the surface roughness using roughness tester.	Surface roughness Tester		G1 06/10/2026 G2 01/10/2026	G1 G2			
8.	Measurement of geometrical parameters of components like screw, gasket using tool maker microscope/profile projector.	Tool maker microscope/profile projector		G1 27/10/2026 G2 15/10/2026	G1 G2			

Approved/ Not approved

HOD Sign with date

Principal Signature with date

Department: Mechanical
Course: Diploma

G P Kangra
Practical Planning & Coverage Status

Details of Practical

Laboratory: Thermal Engg.

Subject: Thermal Engg. Lab - I

Availability of Equipment	STD Ref.	Likely Turn Date	Actual Date	Responsibility	HOD Sign.	Remarks
1. Flash & Fire Point tests using Abbe's / Cleveland / Pensky - & Martin Apparatus.	Write up Thermal Engg. by P.S. Khosla	G-1 → 23/8/16 G-2 → 24/8/16				
2. Calorific value tests using bomb calorimeter (Solid & liquid fuels)	S.J.H. Cupta, Thermal Engg. - I S II by Gyles Prakash.	G-1 → 23/8/16 G-2 → 24/8/16				
3. Assembling & Disassembling of I.C. Engines.	I.C. Engines Models.	- do -	G-1 → 27/8/16 G-2 → 28/8/16			
4. Study of Port timing diagram of I.C. engine - (Petrol / diesel).	- do -	- do -	G-1 → 31/8/16 G-2 → 30/9/16			
5. Study of Valve timing diagram of I.C. Engine (Petrol / Diesel)	- do -	- do -	G-1 → 16/9/16 G-2 → 23/9/16			
6. Study of Petrol & Diesel engine components & Models.	- do -	- do -	G-1 → 17/9/16 G-2 → 15/9/16			

Approved / Not approved

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21/09/16

HOD sign with date

Principal sign with date

G P Kangra

Practical Planning & Coverage Status

 Department: Mechanical Engg.
 Course: Diploma

 Laboratory: Thermal Engg.
 Subject: Thermal Engg Lab - I

Sl. No.	Details of Practical	Availability of		Likely	Actual Date
		Equipment Set up	STD Ref. Write up	Turn/Date	
7.	Study of MPFI System	MPFI System.	-do-	G-1 → 24/9/26 G-2 → 22/9/26	
8.	Study of battery ignition system of multicylinder Petrol engine.	Battery Ignition System Model.	-do-	G-1 → 01/10/26 G-2 → 29/9/26	
9.	Study of cooling system of IC engine	Cooling System Model.	-do-	G-1 → 8/10/26 G-2 → 6/10/26	
10.	Study of lubrication system of IC Engine	Lubrication System Model.	-do-	G-1 → 15/10/26 G-2 → 13/10/26	

PLANNED SYLLABUS COVERAGE(Theory)

Kangra		Department: Mech. Engrg.		Subject Thermal Engrg. - I		
SYLLABUS COVERAGE		Course Diploma		Duration 3 years		
		Total Periods 56		Theory 56		
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-8	Sources of Energy	Brief description of energy sources, Classification of energy sources, Renewable, Non Renewable; Solar energy: Flat plate and Concentrating collector - & its applications (Solar water heater, Photovoltaic cell); Wind energy, Tidal energy, ocean thermal energy, Geothermal energy, Biogas Biomass, Biodiesel, Hydraulic Energy	Thermal Engrg. by P.S. Khanna - I S J K Gupta Second Publication		
2.	9-18	Internal Combustion engines.	Assumptions made in air standard cycle analysis, Brief description along with derivation of efficiency of Carnot, Otto and diesel cycles with P-v and T-s diagrams, Internal & External Combustion engines,	-do-		

This is approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

Sr. No.	Period No.	Topic	Details	Instruction Reference	Additional Study Recommended
			classification of I.C engines, function of each part and materials used for the Component parts, - Cylinder, Crank Case, Crank pin, Crank, Crank Shaft, Connecting rod, Wrist pin, Piston, Cylinder Heads, Exhaust valve, Inlet Valve, Working of 4-stroke & Two stroke Petrol & Diesel engines, Comparison of two stroke and 4-stroke engines, Comparison of CI & SI Engines, Valve timing & Port timing diagrams of 4-stroke and 2-stroke engines	- do -	

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

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

Approved / Not approved	
Date 01/08/26	HOD Sign <i>ASLAM</i>
Date 01/08/26	Principal Sign <i>at</i>

PLANNED SYLLABUS COVERAGE

Department: Mechanical Engg. Subject: Thermal Engg. - I

Course: Diploma Duration: 3 years

P
Kangra

SYLLABUS
COVERAGE

Period No.

Total Periods	56	Theory	56	Instruction Reference	Additional study Recommended	Remarks
Topic	Details					
3. 14-30	IC Engine Systems.	Fuel system of Petrol engines; Principle of operation of Simple Carburetor, fuel system of Diesel engines, Menger type fuel Injection Pump, fuel feed Pump and fuel Injector (description with line diagram), Cooling System; Air Cooling, water Cooling system with thermosiphon method of circulation, and water Cooling system with radiator and forced circulation (description with line diagram), Comparison of water Cooling & Air Cooling system; Ignition Systems Battery coil Ignition & Magneto ignition (description & working) Comparison of two systems, Types of Lubricating system & used in I.C engines with line diagram, objectives of Turbocharging and Supercharging	-do-			

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher

PLANNED SYLLABUS COVERAGE(Theory)

G P
Kangra

Department: Mech Engg. Subject: Thermal Engg. - I

Course: Diploma

Duration: 3 years

SYLLABUS COVERAGE

Total Periods

56

Theory

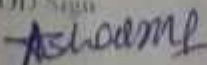
56

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5.	41-56	Air Compressors - ors.	Functions of Air Compressors, Uses of Compressed Air, Types of Air Compressor: Single stage reciprocating Air Compressor - its Construction & working (with line diagram), Multistage Compressors, Advantages over Single stage Compressors, Description of rotary Compressors: Centrifugal Compressors, Axial flow type Compressors & Vane type Compressors	- do -		
		Refrigeration & Air Conditioning (Problem committed)	Refrigeration: Refrigerant, COP, Air refrigeration system, Components Working & Applications, Vapour Compression System: Components, Working & Applications,	- do -		

Sr. No.	Period No.	Topic	Details	Instruction Reference	Additional study Recommended
			Air Conditioning; Classification of Air Conditioning systems; wind -ow Air Conditioner, Summer Air Conditioning system, winter Air Conditioning system, Year-round Air Conditioning system, Central Air Conditioning system.	- do	

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

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

Date: 01/08/26
 Approved / Not approved
 HOD Sign: 
 Date: 01/8/26
 Principal Sign: 

PLANNED SYLLABUS COVERAGE (Theory)

G.P. Kangra		Department: <u>Mechanical Engg.</u> Subject: <u>Manufacturing Engineering</u>			
SYLLABUS COVERAGE		Course <u>Diploma in Mechanical Engg.</u> Duration <u>14 weeks</u>			
		Total Periods _____ Theory _____			
Sl. No.	Period No.	Topic	Details	Instruction Reference	Additional Study Recommended
1. Unit-I	1-5	Cutting fluids & Lubricants	Introduction: Types of Cutting fluids and coolants required in turning, drilling, shaping, sawing & broaching. Selection of Cutting fluids, methods of application of Cutting fluids, Classification of lubricants (Solid, liquid, gaseous) properties and applications of lubricants.	Elements of Workshop Technology (Vol. II II) SK Hazra Chaudhary Media Promoters and Publishers Limited	Manufacturing Technology - PN Rao, Tata Mc Graw Hill Publication
2.	6-10	Lathe operations	Types of Lathes, light duty, Medium duty & Heavy duty geared lathe, CNC lathe (Concept only), Specifications Basic parts and their functions, operations and tools - Turning, Parting off, Knurling, Facing, Boring, drilling, Threading, Step turning, taper turning.		

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

Sr. No.	Period No.	Topic	Instruction Reference	Additional Study Recommended	Remarks
3. Unit-II	11-15	Broaching Machine	Introduction to broaching Types of broaching Machine Horizontal type (Single Ram & duplex ram), Vertical type Pull up, Pull down & Push down, elements of broach tool, Nomenclature tool, material for broaching	- Do -	- Do -
4.	16-20	Drilling	Classification, Basic Parts and their functions, Radial drilling machine, Types of operations, Specifications of drilling Machine, Types of drill & reamers	- Do -	- Do -

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

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

Approved / Not approved	
Date	HOD Sign /
Date	Principal Sign /

Use additional sheets (if required)

PLANNED SYLLABUS COVERAGE(Theory)

G.P. Kangra		Department: <u>Mechanical Engg.</u> Subject: <u>Manufacturing Engg.</u>				
SYLLABUS COVERAGE		Course: <u>Diploma in Mechanical Engg.</u> Duration: <u>14 weeks</u>				
		Total Periods: _____ Theory: <u>56 days</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5. Unit-III	21-26	Welding	Classification, Gas welding techniques, Types of welding flames, Arc welding Principle, equipment, applications, Shielded Metal Arc welding, Submerged Arc welding, TIG MIG welding, Resistance welding Spot welding, Seam welding Projection welding, welding defects, Brazing & Soldering	-Do-	-Do-	
6.	27-32	Milling	Introduction, Types of milling machine, Plain Universal, vertical Constructional details specifications, milling operations, simple Compound Differential indexing (No numerical) Milling Cutters, Teeth materials tool.	-Do-	-Do-	

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

Sr. No.	Serial No.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
7.	33-38	Gear Making	Manufacture of Gears by Casting, Moulding, Stamping, Coining, Extruding, Rolling, Machining, Gear Generating methods, Gear Shaping with Pinion Cutter & Rack Cutter, Gear Hobbing, Description of Gear hob operation of Gear hobbing machine, Gear finishing Process.	-Do-	-Do-	

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

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

Approved / Not approved	
Date	HOD Sign
Date	Principal Sign

* Use additional sheets (if required).

PLANNED SYLLABUS COVERAGE(Theory)

G1 Kangra		Department: <u>Mechanical Engg.</u> Subject: <u>Manufacturing Engg.</u>				
SYLLABUS COVERAGE		Course <u>Diploma in Mech. Engg.</u> Duration <u>14 weeks</u>				
		Total Periods _____ Theory <u>56 days.</u>				
Sl. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
8.	39-44	Press Working (derivation & Problems)	Types of Presses and specifications, Press working operations, cutting, bending drawing, punching, blanking notching, lancing, Die set components - Punch and die shoe, guide pin bolster plate, stripper stock guide feed block pilot, Punch & die clearance for blanking and piercing effect of clearance	-Do-	-Do-	
9.	45-56	Grinding & Finishing Processes	Principles of metal removal by Grinding abrasive, Natural & artificial Bond & grinding processes, vitrified silicate shellac rubber bakelite factors affecting selection of grind wheels, size and shape of wheel Kind of abrasive grain size, grade & strength of Bond structure of grain	-Do-	-Do-	

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned in his file.

Sr. No.	Serial No.	Topic	Reference	Study Recommended
		grinding, Kind of grind material, Grinding machine Classification Cylindrical surface tool & cutter Grinding Machine, Constructional details, Principle of Centreless grinding, Advantages & Limitations of Centreless grinding, Finishing by grinding, Honing, Lapping, Surface finishing Electroplating, Basic Principles, Plating metals, applications	-Do-	-Do-

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

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

Approved / Not approved	
Date	HOD Sign /
Date	Principal Sign /

Use additional sheets (if required)

GP
Kangra

SYLLABUS
COVERAGE

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommendation
			Hot dipping, Galvanizing Tin Coating, Parkerizing Anodizing, metal spraying, wire process Powder process and applications, Organic Coating, Finishing Specifications	-Do-	-Do-

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

PLANNED SYLLABUS COVERAGE(Theory)

GPK H-17

GPK 4-17

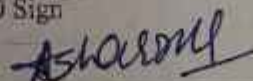
UNNED SYLLABUS COVERAGE (Theory)						
Department: Mechanical Engg.		Subject: Basic Mechanical Engineering				
Course: Program Core		Duration: 14 weeks				
Total Periods: 51		Theory				
Sl. No.	Period Nos.	Topic	Details	Instructional Reference	Additional Study Recommended	Gr. Marks
1	1-14	Introduction to Thermodynamics	Role of thermodynamics in Engineering & science, types of system, Thermodynamic equilibrium, properties, state, process cycle, Elementary introduction to zeroth, first & second law of thermodynamics, heat & work interaction, for various processes, concept of Heat Engine, Heat pump & refrigeration, efficiency / COP, Kelvin Planck & Clausius statement, Carnot cycle, Carnot efficiency, T-S & P-V diagrams, concept of Entropy.	Basic Mechanical Engineering M.P. Khorasani S.C. Chandra Elements of Mechanical Engineering M.C. Mathur		
	15-25	Heat Transfer & Thermal Power Plant	Heat Transfer, Modes of Heat transfer, Conduction, Fourier's equation, conduction, Heat transfer through composite walls, Simple numerical problems, convection, Heat Transfer, Natural & forced convection, Radiation & Absorption, reflection & transmission of radiation, concept of black body, Stefan-Boltzmann law, Thermal Power plant layout, Rankine cycle, Fire tube & water tube boiler, Babcock & Wilcox, Cochran Boiler			
	26-34	Steam Turbines & Internal Combustion Engines	Impulse & Reaction Turbines, Condensers, Jet & Surface condensers, Cooling towers, Otto cycle, Diesel cycle, Dual cycle, P-V & T-S diagrams, I.C. Engines, 2 stroke & 4-stroke I.C. engines, SI & CI engines			

to be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned (unit) file.

No. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
4-	35-45	Engineering Materials & Manufacturing Processes	Engineering Materials, classification & their properties, Metal casting, Moulding, Patterns, Metal working, hot & cold working, Metal forming, Extrusion, Forging, Rolling, Drawing, Gas welding, Arc welding, Soldering & Brazing.			
5.	45-56	Machin Tools & Machining Processes	Machin Tools: Lathe Machine & types, Lathe operation, Milling Machine & types, Milling operation, Shaper & planer Machine. Difference b/w shaper & planer machine, Drill, reamer, reamer, Drilling Machine, operation, Grinding Machine & operations.			

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

r. a.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks

Approved / Not approved	
Date 01/08/2026	HOD Sign 
Date	Principal Sign 

PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>Mechanical</u> Subject: <u>Material Science & Engg</u>				
SYLLABUS COVERAGE		Course: <u>Engg. Programme Core</u> Duration: <u>14 weeks</u>				
		Total Periods: <u>56</u> Theory: <u>56</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
01.			- unit cell + space lattice - Crystal system:- The 07 basic crystal systems for metallic elements. - BCC, HCP, FCC. - Co-ordination number for Simple cubic, BCC & FCC. - Atomic radius:- definition - Atomic radius for SC, BCC, FCC & HCP. (only formula) - Atomic packing factor for SC, BCC, FCC & HCP. - Bonds in solids:- primary & secondary bonds. Concept of types of primary bonds: Ionic, Covalent and metallic bonds.	Material Science & Engg. by R. K. Rajput.		
01	1-14.	Crystal Structure and Bonds.				
02.		Phase diagram Ferrous metals & its alloys.	- Introduction to Isomorphs, Eutectic & Eutectoid systems. - Iron-carbon binary phase diagram. Iron & carbon steel.			

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
02	15-27	Phase diagram, Ferrous Metals & its alloys.	Iron ores:- Pig Iron, classification, composition and effects of Impurities on Iron. Cast Iron:- classification, composition, properties and uses. Wrought Iron:- properties & uses. Standard commercial grades of Steel as per BIS & AISI. Alloy steels- purpose of alloying, effects of alloying elements. Important steel alloys:- silicon steel, high speed steel, heat resisting steel, spring steel, stainless steel.			

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

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

Approved / Not approved	
Date	HOD Sign
Date	Principal Sign

PLANNED SYLLABUS COVERAGE(Theory)

GPK-F-17

G P Kangra		Department: Mech. Engg. Subject Material Science & Engg.				
		Course _____			Duration 14 Weeks	
SYLLABUS COVERAGE		Total Periods 56			Theory 56	
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
03	28-37	Non Ferrous Metals & alloys.	Properties & uses of Al, Cu, Sn, Pb, Zn, Mg, and Ni. Copper alloys:- Brasses, bronzes, composition, uses and properties. Aluminium alloys:- Duralumin, hardalumin, magnesium-composition, properties and uses. Nickel alloys:- Inconel, monel, nicrome, composition, properties & uses. Antifriction/Bearing alloys. Various types of bearing, bronze standard. commercial grades as per BIS/ASME.			
04		Failure analysis & Testing of Materials.	Failure analysis introduction. Fracture:- Ductile, brittle fracture, cleavage, notch sensitivity, fatigue, concept of endurance limit, concept of creep, creep curve, creep fracture. Destructive testing, Tensile testing, compression testing, Hardness testing. Brinell, Rockwell, bend			

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
	38-46	Testing of materials	test; Torsion test, fatigue test, creep test, Non-destructive testing, visual inspection, magnetic particle inspection, liquid penetrant test, ultrasonic inspection, radiography.			
05		corrosion	Nature of corrosion and its causes. Electrolytes; factors affecting corrosion; environment, material properties and physical conditions.			

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

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

Approved / Not approved	
Date	HOD Sign
Date	Principal Sign

PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>Mech. Engrg.</u> Subject <u>MS&E</u>				
SYLLABUS COVERAGE		Course _____			Duration <u>14 weeks</u>	
		Total Periods <u>56</u>			Theory <u>56</u>	
Sl. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
05	47-56	Corrosion & Surface Engineering	Types of corrosion. Corrosion control. Material selection. Environment control. Surface engineering processes:- coatings and surface treatments, cleaning and mechanical finishing of surfaces. Electroplating and special metallic plating; electro-polishing and photo-etching. conversion coatings:- oxide, phosphate and chrome coatings. Thin film coatings.			

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
			PVD & CVD. Hard facing. Thermal spraying and high energy processes.			

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

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

Approved / Not approved	
Date 01/08/26	HOD Sign <i>[Signature]</i>
Date 01/08/26	Principal Sign <i>[Signature]</i>

Use additional sheets (if required).