

GOVT. POLYTECHNIC BALANGIR

Department of Mechanical Engineering

LESSON PLAN: 2026-27	
Name of the Faculty: Rasmi Ranjan Jena (Lecture Stage-1)	
Subject: METROLOGY AND MEASUREMENT (TH1)	
Program: Diploma in Mechanical Engineering	
Semester: 5 th	
Total Contact Hours: 45	
Total Marks: 100	
Assessment: Progressive –30, End Term – 70	
Credits: 3	

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO₁. Define accuracy, precision, calibration, sensitivity, repeatability and such relevant terms in metrology.

CO₂. Distinguish between various types of errors.

CO₃. Illustrate the principle of operation of an instrument and select suitable measuring device for a particular application.

CO₄. Explain the concept of calibration of an instrument.

CO₅. Summarize the data obtained from the different measurements processes and present it in the graphical form, statistical form.

Unit I – Measurement Systems & Measuring Instruments (10 Hours)				
Class No.	Topic	Sub-topics	Teaching Aids/Activities	COs
1	Introduction to Measurement	Definition, significance, direct and indirect methods of measurement	PPT, lecture method, examples	CO1
2	Generalized Measuring System	Elements and functional block diagram	Charts, diagrams	CO1
3	Standards of Measurement	Primary and Secondary standards	Lecture and charts	CO1
4	Instrument Characteristics	Accuracy, precision, sensitivity, repeatability	Numerical examples	CO1
5	Instrument Characteristics	Range, threshold, hysteresis, calibration	PPT and demonstration	CO1
6	Errors in Measurement	Classification, systematic and random errors	Problem solving	CO1

7	Thread & Angular Measurement	Thread gauge micrometer, bevel protractor	Instrument demo	CO1
8	Angular Measurement & Gauges	Sine bar, plug gauge, ring gauge	Lab Demonstration (Virtual Lab)	CO1
9	Gauges & Comparators	Snap gauge, limit gauge, comparators	Models and charts	CO1
10	Surface Finish & CMM	Talysurf tester and CMM	Videos and lab demo	CO1

Unit II – Transducers, Strain Gauges and Force/Torque/Pressure Measurement (10 Hours)

Class No.	Topic	Sub-topics	Teaching Aids/Activities	COs
11	Introduction to Transducers	Characteristics and classification	PPT and charts	CO2
12	Inductive Transducers	Two-coil self-inductance transducer	Animated diagrams	CO2
13	Piezoelectric Transducer	Construction and applications	Video demonstration	CO2
14	Strain Gauges	Introduction and classification	Samples and charts	CO2
15	Mounting of Strain Gauges	Methods and precautions	Lab Demonstration (Virtual Lab)	CO2
16	Strain Gauge Rosettes	Two and three element rosettes	Diagrams	CO2
17	Force Measurement	Spring balance and proving ring	Instrument demo	CO2
18	Force Measurement	Load cell and applications	Case studies	CO2
19	Torque Measurement	Pronybrake, eddy current, hydraulic dynamometer	Videos	CO2
20	Pressure Measurement	McLeod gauge	Lab Demonstration (Virtual Lab)	CO2

Unit III – Applied Mechanical Measurements (8 Hours)

Class No.	Topic	Sub-topics	Teaching Aids/Activities	COs
21	Speed Measurement	Classification of tachometers	Charts	CO3
22	Speed Measurement	Revolution counters, eddy current tachometers	Instrument demo	CO3

23	Displacement Measurement	LVDT construction and working	LVDT setup	CO3
24	Flow Measurement	Rota-meter	Flow rig	CO3
25	Flow Measurement	Turbine meter	Models and videos	CO3
26	Temperature Measurement	Resistance thermometer	Instrument display	CO3
27	Temperature Measurement	Optical pyrometer	Video demo	CO3
28	Miscellaneous Measurements	Hygrometer, hydrometer, float gauge, sphygmomanometer	Demonstration	CO3

Unit IV – Limits, Fits, Tolerances & Thread Measurements (10 Hours)

Class No.	Topic	Subtopics	Teaching Aids/Activities	COs
29	Limits, Fits and Tolerances	Concepts and terminology	PPT	CO4
30	Selective Assembly	Interchangeability and applications	Industrial examples	CO4
31	Hole & Shaft Basis System	Systems of fits	Charts	CO4
32	Taylor's Principle	Design of plug and ring gauges	Gauge samples	CO4
33	IS Standards	IS 919-1993 and IS 3477-1973	Standards handbook	CO4
34	Angular Measurement	Universal bevel protractor and sine bar	Instrument demo	CO4
35	Angular Measurement	Spirit level, clinometer, angle gauges	Lab demo	CO4
36	Screw Thread Measurement	ISO grades and thread errors	Charts	CO4
37	Thread Elements	Major, minor, effective diameter and pitch	Diagrams, Numericals	CO4
38	Thread Measurement Methods	Two-wire method, floating carriage micrometer	Instrument demo	CO4

Unit V – Gear Measurement & Machine Tool Testing (7 Hours)

Class No.	Topic	Subtopics	Teaching Aids/Activities	COs
39	Gear Measurement	Analytical and functional inspection	Gear samples	CO5
40	Gear Testing	Rolling test	Testing videos	CO5

41	Tooth Thickness Measurement	Constant chord method and gear tooth vernier	Lab instruments	CO5
42	Gear Errors	Backlash, runout and composite errors	Charts	CO5
43	Machine Tool Testing	Parallelism and straightness	Demonstration	CO5
44	Machine Tool Testing	Squareness, co-axiality and roundness	Dial gauge setup	CO5
45	Machine Tool Testing	Runout, alignment testing and revision	PPT and discussion	CO5
45	Surface Finishing Processes	Electroplating: principles, metals used; Hot dipping (galvanizing, tin coating); Parkerizing, Anodizing, Metal spraying, Organic coatings	Coating samples, visual comparison	CO5

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GOVT. POLYTECHNIC BALANGIR**Department of Mechanical Engineering**

LESSON PLAN: 2026-27	
Name of the Faculty: Paresh Kumar Mishra (Lecture Stage-1)	
Subject: DESIGN OF MACHINE ELEMENTS (TH2)	
Program: Diploma in Mechanical Engineering	
Semester: 5th	
Total Contact Hours: 45	
Total Marks: 100	
Assessment: Progressive Assessment – 30, End Term Examination – 70	
Credits: 3	

COURSE OUTCOME:

After completion of the course, the students will be able to

- CO1 : Analyze various modes of failure of machine components under different loading conditions.
- CO2 : Design and prepare detailed part and assembly drawings of mechanical components.
- CO3 : Use design data books and relevant design codes effectively in component design.
- CO4 : Select appropriate standard components and specifications from manufacturer catalogs.
- CO5 : Create component and assembly drawings using CAD software.

UNIT-I : INTRODUCTION TO DESIGN (12 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
1	Introduction to Machine Design	Design philosophy, design procedure, design considerations	PPT, machine component samples	CO1
2	Types of Loads	Static, dynamic and impact loads	Models and demonstrations	CO1
3	Stress and strain	Concepts, stress-strain diagram for ductile and brittle materials	Charts and animations	CO1
4	Types of Stresses	Tensile, compressive, shear, bending and torsional stresses	Numerical examples	CO1
5	Principal Stresses	Principal stresses and simple numericals	Problem-solving session	CO1
6	Creep and Fatigue	Creep curve, fatigue failure	Industrial case studies	CO1
7	S-N Curve and Endurance Limit	Fatigue analysis and endurance limit	Graph interpretation activity	CO1
8	Factor of Safety and Stress Concentration	Design safety and stress concentration	Failure analysis examples	CO1
9	Engineering Materials	Material properties and selection criteria	Material samples	CO3
10	Material Designation and Standards	IS standards, international standards, standardization	Standard charts and catalogues	CO3
11	Design Data Book and Preferred Numbers	Use of design data books and preferred number series	Data book exercises	CO3
12	Theories of Elastic Failure	Maximum stress, maximum shear stress, distortion energy theory	Numerical practice	CO1

UNIT-II : DESIGN OF SIMPLE MACHINE PARTS (8 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
13	Cotter Joint	Construction, applications and design	Models and sketches	CO2
14	Knuckle Joint	Construction and design procedure	Component demonstration	CO2
15	Turnbuckle	Design and applications	Assembly drawing activity	CO2
16	Hand and Foot Lever	Design procedure and applications	Numerical examples	CO2
17	Bell Crank Lever	Design and force analysis	Problem-solving activity	CO2
18	C-Clamp, Offset Link and Overhang Crank	Design considerations	CAD sketches and models	CO2
19	Bearings and Classification	Sliding and rolling contact bearings	Bearing samples	CO4
20	Selection of Ball Bearings	Static load rating, dynamic load rating, catalogue selection	Manufacturer catalogue exercise	CO4

UNIT-III: DESIGN OF SHAFTS, KEYS, COUPLINGS AND SPUR GEARS (8 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
21	Shafts	Types, materials and standard sizes	Shaft samples	CO2
22	Design of Solid Shafts	Strength criterion	Numerical examples	CO2
23	Design of Hollow Shafts and ASME Code	Rigidity criterion and design code	Problem-solving session	CO2
24	Sunk Keys and Keyways	Design and effect on shaft strength	Models and calculations	CO2
25	Muff Coupling	Design procedure	Assembly drawing	CO2
26	Flange and Bush-Pin Flexible Coupling	Design considerations	CAD demonstration	CO2
27	Spur Gear Terminology	Gear nomenclature and design considerations	Gear models	CO2
28	Lewis Equation and Gear Design	Gear tooth strength and power transmission	Numerical practice	CO2

UNIT-IV: DESIGN OF POWER SCREWS AND SPRINGS (10 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
29	Power Screw Threads	Square, trapezoidal and acme threads	Thread models	CO2
30	Screw Friction and Torque	Torque required to raise and lower load	Numerical examples	CO2
31	Self-Locking and Efficiency	Overhauling and efficiency of screws	Problem-solving activity	CO2
32	Design of Screw Jack	Design procedure and calculations	Design worksheet	CO2

33	Toggle Jack	Construction and applications	Animation/video	CO2
34	Springs	Classification, terminology and applications	Spring samples	CO2
35	Spring Materials and Specifications	Materials and standard specifications	Charts and catalogues	CO2
36	Stresses in Helical Springs	Wahl correction factor and stress analysis	Numerical examples	CO2
37	Deflection and Energy Storage	Spring stiffness and energy storage	Graphical analysis	CO2
38	Design of Compression, Tension and Leaf Springs	Design procedure and applications	Design exercises	CO2

UNIT-V: FASTENERS, WELDED JOINTS, ERGONOMICS AND CAD DRAWING (7 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
39	Screwed Fasteners	Stresses in screwed fasteners	Fastener samples	CO2
40	Bolts of Uniform Strength	Design concepts and applications	Numerical examples	CO2
41	Bolted Joints under Eccentric Loading	Design procedure	Problem-solving session	CO2
42	Fillet Welded Joints	Parallel and transverse fillet welds	Weld models	CO2
43	Ergonomics in Design	Man-machine relationship, safety and control	Case studies	CO5
44	Aesthetic Considerations in Design	Shape, size, colour and surface finish	Product comparison activity	CO5
45	CAD-Based Component & Assembly Drawing, Revision and Quiz	Part drawing, assembly drawing and revision	CAD software demonstration and MCQ quiz	CO5

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GOVT. POLYTECHNIC BALANGIR**Department of Mechanical Engineering**

LESSON PLAN: 2026-27	
Name of the Faculty:	
Subject: PRODUCTION AND OPERATION MANAGEMENT (TH3) Program: Diploma in Mechanical Engineering Semester: 5 th Total Contact Hours: 45 Total Marks: 100 Assessment: Progressive –30, End Term – 70 Credits: 3	

COURSE OUTCOME:

After successful completion of the course, the student will be able to:

- **CO1:** Explain process planning concepts and their relationship with productivity and manufacturing efficiency.
- **CO2:** Apply forecasting techniques and scheduling methods for effective production planning.
- **CO3:** Analyze production systems using break-even analysis and aggregate production planning techniques.
- **CO4:** Design efficient facility layouts and assembly line balancing for improved operational performance.
- **CO5:** Apply material management principles, purchasing procedures, and vendor management practices in manufacturing organizations.

UNIT – I: Process Planning and Process Engineering

Total Classes: 14 (Class No. 1–14)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	Course Outcome
1	Introduction to Process Planning	Definition, objectives, importance of process planning	Chalk & board, industrial examples	CO1
2	Process Planning Functions	Functions, prerequisites of process planning	Flowchart, discussion	CO1
3	Steps in Process Planning	Sequence of process planning activities	Process flow diagram	CO1
4	Factors Affecting Process Planning	Material, machine, manpower, production quantity	Case studies	CO1
5	Make-or-Buy Decision	Factors, advantages, limitations	Numerical examples, discussion	CO1
6	Plant & Machine Capacity	Capacity planning, machine capacity	Numerical illustrations	CO1
7	Process Engineering	Introduction, preliminary part print analysis	Sample engineering drawings	CO1
8	Workpiece Characteristics	General characteristics, principal process selection	Drawing interpretation	CO1
9	Functional Surfaces	Functional surfaces, machining requirements, finishing operations	Practical examples	CO1
10	Dimensional Analysis	Types of dimensions, geometry, baselines	Engineering drawing exercises	CO1
11	Dimensional Analysis (Contd.)	Direction of dimensions, dimensional interpretation	Board work	CO1
12	Tolerance Analysis	Workpiece variation, tolerance terminology, tolerance stack-up	Numerical examples	CO1
13	Workpiece Control	Equilibrium theories, concept of location	Sketches and illustrations	CO1
14	Geometric & Mechanical Control	Geometric, dimensional and mechanical control, unit revision	Recap, oral quiz	CO1

UNIT – II : Production Forecasting & Scheduling

Total Classes: 8 (Class No. 15–22)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	Course Outcome
15	Introduction to Forecasting	Importance, objectives, strategic role	Chalk & board	CO2
16	Demand Behaviour	Time frame, demand patterns	Graphs, examples	CO2
17	Forecasting Methods	Qualitative forecasting techniques	Case discussion	CO2
18	Forecasting Methods	Quantitative forecasting techniques	Numerical problems	CO2
19	Forecast Accuracy	Error measurement and evaluation	Numerical exercises	CO2
20	Scheduling Concepts	Objectives, loading and sequencing	Flowcharts	CO2
21	Scheduling Techniques	Monitoring, APS systems, Theory of Constraints	Videos/PPT	CO2
22	Employee Scheduling	Workforce scheduling, unit revision	Group discussion	CO2

UNIT – III : Break-Even Analysis & Aggregate Planning
Total Classes: 8 (Class No. 23–30)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	Course Outcome
23	Introduction to Break-even Analysis	Fixed cost, variable cost, contribution	Chalk & board	CO3
24	Break-even Charts	Construction and interpretation	Numerical problems	CO3
25	Break-even Applications	Process, plant and equipment selection	Industrial examples	CO3
26	Aggregate Production Planning	Introduction, objectives	Flowcharts	CO3
27	Capacity Planning	Capacity adjustment strategies	Case study	CO3
28	Demand Management	Demand management concepts	Discussion	CO3
29	Hierarchical Planning	Collaborative planning approaches	Presentation	CO3
30	Aggregate Planning for Services	Service sector planning, revision	Recap quiz	CO3

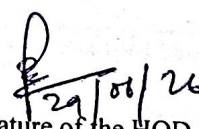
UNIT – IV : Assembly Line Balancing
Total Classes: 8 (Class No. 31–38)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	Course Outcome
31	Introduction to Assembly Lines	Types and objectives	Chalk & board	CO4
32	Assembly Line Balancing	Concepts, balancing procedures	Numerical examples	CO4
33	Task Allocation	Splitting tasks and precedence	Charts	CO4
34	Flexible Layouts	Flexible assembly lines	Industrial examples	CO4
35	U-Shaped Layouts	Design and applications	Layout sketches	CO4
36	Mixed Model Line Balancing	Concepts and applications	Case study	CO4
37	Computerized Assembly Line Balancing	Software-based balancing	PPT demonstration	CO4
38	Revision	Current trends and unit revision	Oral quiz	CO4

UNIT – V : Material Management
Total Classes: 7 (Class No. 39–45)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	Course Outcome
39	Introduction to Material Management	Definition, objectives, importance	Chalk & board	CO5
40	Purchasing Policies	Purchasing procedures and policies	Flowcharts	CO5
41	Stores Management	Functions of stores, inventory records	Store layout diagrams	CO5
42	Vendor Development	Need and methods of vendor development	Case discussion	CO5
43	Vendor Selection	Selection criteria	Comparative analysis	CO5
44	Vendor Rating	Vendor analysis and rating methods	Practical examples	CO5
45	Material Management Review	Integrated material management, unit revision	Summary discussion & oral quiz	CO5

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Department of Mechanical Engineering

LESSON PLAN: 2026-27	
Name of the Faculty: Paresh Kumar Mishra (Lecture Stage-1)	
Subject: ADVANCED MANUFACTURING PROCESSES (TH4)	
Program: Diploma in Mechanical Engineering	
Semester: 5th	
Total Contact Hours: 45	
Total Marks: 100	
Assessment: Progressive Assessment – 30, End Term Examination – 70	
Credits: 3	

COURSE OUTCOME:

After completion of the course, the students will be able to

- CO1 : Identify various classifications of manufacturing processes.
- CO2 : Explain the working principles of mechanical energy-based processes.
- CO3 : Describe the functioning of electrical energy-based manufacturing processes.
- CO4 : Explore the principles behind chemical and electro-chemical energy-based processes.
- CO5 : Discuss the working of thermal energy-based manufacturing processes.

UNIT-I: INTRODUCTION & ADDITIVE MANUFACTURING (5 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
1	Introduction to Unconventional Machining	Need, classification, overview	PPT and industrial videos	CO1
2	Additive Manufacturing	Introduction and need for AM	Models and videos	CO1
3	Fundamentals of AM	Basic concepts and process chain	Animation	CO1
4	AM Process Chain	Steps involved in AM process	Flowchart activity	CO1
5	Advantages, Limitations & Applications of AM	Industrial applications	Case studies	CO1

UNIT-II : MECHANICAL ENERGY BASED PROCESSES (8 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
6	Abrasive Jet Machining (AJM)	Principle and equipment	Video demonstration	CO2
7	AJM Parameters	MRR and applications	Numerical examples	CO2
8	Water Jet Machining (WJM)	Principle and equipment	Animation	CO2
9	WJM Parameters	MRR and applications	Industrial examples	CO2
10	Abrasive Water Jet Machining (AWJM)	Principle and equipment	Process video	CO2
11	AWJM Parameters	MRR and applications	Discussion	CO2
12	Ultrasonic Machining (USM)	Principle and equipment	Charts and models	CO2
13	USM Parameters	MRR and applications	Problem-solving session	CO2

UNIT-III : ELECTRICAL ENERGY BASED PROCESSES (8 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
14	Introduction to EDM	Principle and equipment	EDM video	CO3
15	EDM Process Parameters	Surface finish and MRR	Numerical examples	CO3
16	Electrode / Tool Materials	Tool wear and selection	Sample electrodes	CO3
17	Dielectric and Flushing	Functions and methods	Charts	CO3
18	Power & Control Circuits	EDM circuitry	Circuit diagrams	CO3

19	Tool Wear Mechanism	Causes and effects	Case study	CO3
20	Wire Cut EDM	Construction and working	Animation	CO3
21	Applications of EDM & WEDM	Industrial applications	Discussion	CO3

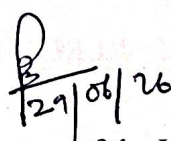
UNIT-IV : CHEMICAL & ELECTRO-CHEMICAL ENERGY BASED PROCESSES (12 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
22	Chemical Machining (CHM)	Principle and process	Process video	CO4
23	Etchants	Types and characteristics	Samples and charts	CO4
24	Maskants	Types and properties	Demonstration	CO4
25	Maskant Application Techniques	Methods of application	Activity	CO4
26	CHM Parameters	Surface finish and MRR	Numerical examples	CO4
27	Applications of CHM	Industrial applications	Case studies	CO4
28	Electro Chemical Machining (ECM)	Principle and equipment	Animation	CO4
29	ECM Electrical Circuit	Components and functions	Circuit diagrams	CO4
30	ECM Parameters	Surface roughness and MRR	Problem solving	CO4
31	Electro Chemical Grinding (ECG)	Principle and applications	Video	CO4
32	Electro Chemical Honing (ECH)	Principle and applications	Demonstration	CO4
33	Applications of ECM, ECG & ECH	Industrial applications	Discussion	CO4

UNIT-V : THERMAL ENERGY BASED PROCESSES & ENGINEERING MATERIALS (12 Classes)

Class	Topic	Subtopics	Teaching Aids / Activities	Course Outcome
34	Laser Beam Machining (LBM)	Principle and equipment	Laser machining video	CO5
35	Laser Beam Drilling	Working and applications	Animation	CO5
36	Beam Control Techniques	Types and methods	Charts	CO5
37	Applications of LBM	Industrial uses	Discussion	CO5
38	Plasma Arc Machining (PAM)	Principle and equipment	Industrial video	CO5
39	PAM Parameters	Process variables and applications	Case studies	CO5
40	Electron Beam Machining (EBM)	Principle and equipment	Animation	CO5
41	Beam Control in EBM	Focusing and control methods	Charts	CO5
42	Applications of EBM	Industrial applications	Discussion	CO5
43	Engineering Materials	Metals and polymers	Material samples	CO5
44	Engineering Materials	Ceramics and composites	Material samples	CO5
45	Revision & Quiz	Summary of thermal processes and materials	Interactive quiz	CO5

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GOVT. POLYTECHNIC BALANGIR
Department of Mechanical Engineering

LESSON PLAN: 2026-27

Name of the Faculty:

Subject: UNIVERSAL HUMAN VALUES (TH5)

Program: Diploma in Mechanical Engineering

Semester: 5th

Total Contact Hours: 45

Total Marks: 100

Assessment: Progressive –30, End Term – 70

Credits: 3

COURSE OUTCOME:

After successful completion of the course, the student will be able to:

- **CO1:** Identify fundamental human aspirations such as happiness and prosperity and appreciate the importance of value education.
- **CO2:** Differentiate between the Self and the Body and understand their respective needs for a balanced life.
- **CO3:** Practice self-reflection and self-exploration to enhance decision-making, emotional balance, and personal growth.
- **CO4:** Develop respectful, trustworthy, and harmonious relationships within family and society.
- **CO5:** Apply ethical values, professional responsibility, and social commitment for sustainable human development.

UNIT – I : Introduction to Value Education and Human Values

Total Classes: 8 (Class No. 1–8)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	CO Mapping
1	Introduction to Value Education	Meaning, concept and need for value education	Lecture, discussion	CO1
2	Importance of Value Education	Importance in personal and professional life	PPT, real-life examples	CO1
3	Values and Skills	Difference between values and skills	Group discussion	CO1
4	Human Aspirations	Concept of happiness and prosperity	Interactive lecture	CO1
5	Happiness	Understanding happiness through right understanding	Case studies	CO1
6	Prosperity	Meaning of prosperity and its role in life	Classroom discussion	CO1
7	Right Understanding & Relationships	Methods to achieve happiness and prosperity	Activity-based learning	CO1
8	Unit Review	Summary, interaction and revision	Quiz / oral discussion	CO1

UNIT – II : Harmony in the Human Being

Total Classes: 8 (Class No. 9–16)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	CO Mapping
9	Harmony in Human Being	Introduction to harmony	Lecture	CO2
10	Self (I) and Body	Difference between Self and Body	PPT, discussion	CO2
11	Needs of Self	Happiness, knowledge, satisfaction	Interactive lecture	CO2
12	Needs of Body	Physical facilities and care	Classroom discussion	CO2
13	Harmony of Self with Body	Coordination between Self and Body	Case examples	CO2
14	Mental Well-being	Practices for emotional balance	Meditation activity	CO2, CO3
15	Physical Well-being	Healthy lifestyle practices	Group activity	CO2
16	Unit Review	Revision and discussion	Quiz	CO2, CO3

UNIT – III : Harmony in the family and Society
Total Classes: 8 (Class No. 17–24)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	CO Mapping
17	Family as Basic Unit	Importance of family	Lecture	CO4
18	Human Relationships	Values in relationships	Discussion	CO4
19	Trust	Meaning and importance of trust	Activity	CO4
20	Respect	Understanding mutual respect	Role play	CO4
21	Harmony in Society	Concept of an undivided society	PPT	CO4
22	Universal Human Order	World family concept	Group discussion	CO4
23	Social Harmony	Cooperation and mutual understanding	Case study	CO4
24	Unit Review	Revision and interaction	Quiz	CO4

UNIT – IV : Harmony in Nature and Existence
Total Classes: 8 (Class No. 25–32)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	CO Mapping
25	Nature and Harmony	Introduction	Lecture	CO5
26	Four Orders of Nature	Material, plant, animal and human orders	PPT	CO5
27	Material & Plant Orders	Mutual relationship	Discussion	CO5
28	Animal & Human Orders	Mutual fulfillment	Classroom interaction	CO5
29	Co-existence	Concept of coexistence	Video/PPT	CO5
30	Harmony in Existence	Holistic perception	Discussion	CO5
31	Environmental Balance	Human role in environment	Case studies	CO5
32	Unit Review	Revision	Quiz	CO5

UNIT – V : Professional Ethics
Total Classes: 8 (Class No. 33–40)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	CO Mapping
33	Professional Ethics	Introduction and concept	Lecture	CO5
34	Ethical Human Conduct	Values in professional life	Discussion	CO5
35	Accountability	Professional responsibility	Case examples	CO5
36	Ethical Decision Making	Framework for ethical decisions	Group activity	CO5
37	Case Study–I	Professional ethics scenario	Case discussion	CO5
38	Case Study–II	Ethical dilemma analysis	Group presentation	CO5
39	Universal Human Values	Applying ethics in profession	Interactive session	CO5
40	Unit Review	Revision	Quiz	CO5

UNIT – VI : Personal Development and Social Responsibility
Total Classes: 5 (Class No. 41–45)

Class No.	Topic	Subtopics Covered	Teaching Aids / Activities	CO Mapping
41	Self-Reflection & Self-Exploration	Techniques for self-assessment and personal growth	Guided reflection, discussion	CO3
42	Personal Goal Setting	Setting personal goals aligned with universal values	Activity-based learning	CO3
43	Social Responsibility	Understanding individual responsibility towards society	Lecture, case discussion	CO5
44	Community Service	Participation in social initiatives and community engagement	Group activity, field examples	CO5
45	Course Review & Reflection	Overall revision, value integration, reflective discussion	Reflection exercise, oral quiz	CO3, CO5

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