



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)
Diploma (Common to All Branches)
Semester-II

- A) **Course Code** : **2000B01AT015**
 B) **Course Title** : **Applied Physics**
 C) **Pre- requisite Course Code and Title** :
 D) **Rationale** :

E) The objective of teaching Applied Physics with Practical in the Polytechnic syllabus is to build a strong scientific foundation through the core principles of physics. This course emphasizes both theoretical understanding and hands-on experimentation, allowing students to connect scientific concepts with real-world applications. Through practical sessions, students develop critical thinking, problem-solving skills, and the ability to analyze and interpret data effectively. The ultimate goal is to prepare students for technical fields by equipping them with the scientific knowledge and practical experience necessary for innovation, sustainability, and success in their future careers.

Applied Physics

CO 1 Solve problems that require unit conversions, dimensional analysis and apply measurement uncertainty to express results with precision.

(Approx. Hrs: CI+ LI+SW+SL- 18)

Session Outcomes (SOs)	Laboratory Instruction (LI or P)	Class room Instruction (CI or L)	Self-Learning (SL)
SO1.1 Convert unit of the given physical quantity from one-unit system to another.	LE1.1 Use Vernier calipers to measure the dimensions of given object in significant figures and estimate errors precisely.	UNIT 1. Unit & Dimensional Analysis 1.1 Units for measurement 11 Fundamental and Derived units 12 S. I. units, Advantages of SI unit 1.2 Dimensional Analysis 21 Dimensions & Dimensional Formula 22 Applications of Dimensional Analysis 1.3 Accuracy & Precision 1.31 Accuracy & Precision definition and examples	1.1 Conversion between different unit system(MKS,FPS, CGS)
SO1.2 Derive the formula of derived physical quantities using dimensional analysis.	LE1.2 Use Screw gauge to measure the dimensions of given object in significant figures and estimate errors precisely.		1.2 Seven basic and supplementary units
SO1.3 Express results with appropriate precision and accuracy.	LE1.3 Use Spherometer to measure the dimensions of given objects in significant figures and estimate error precisely.		1.3 Absolute, Relative and percentage error
			1.4 Significant figure and rounding off

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self-Learning

SW-1 Suggested Sessional Work (SW):

a. Assignments:

- i. Measure dimensions of classroom, household items, thickness of paper, aluminum foil, iron bar and items found in surroundings.
- ii. Analyze the correctness of given physical relation using dimensional analysis.
- iii. Identify the instruments used for measurement of seven fundamental quantities.
- iv. Identify instruments used for measurement of derived quantities.

b. Mini Project:

- i. Measuring projects: students can include activities like: creating a scale model using precise measurements, designing a container with specific volume requirements, measuring objects around the classroom using different units, use everyday objects like paperclips or hand spans to measure lengths of different items.
- ii. Prepare working model of measuring instruments – Vernier Calipers, Screw gauge.
- iii. Collect low dimension items from household and market and calculate the thickness with the help of Vernier Calipers and screw gauge.

c. Other Activities (Specify):

- i. Seminar on Errors in measurements.
- ii. Seminar on precision and accuracy of any instrument.

CO 2 Solve mechanics related engineering problems by applying the knowledge of forces and properties of materials.

(Approx. Hrs: CI+ LI+SW+SL - 18)

Session Outcomes (SOs)	Laboratory Instruction (LI or P)	Class room Instruction (CI or L)	Self-Learning (SL)
SO2.1 Classify conservative and non-conservative forces in a given situation.	LE2.1 Determine 'g' using simple pendulum.	Unit-2.0 Force and General Properties of matter 2.1 Force 2.11 Conservative and non-conservative forces 2.12 Gravitational Force, Relation between 'G' and 'g' and Factors affecting 'g' 2.2 Surface Tension 2.21 Adhesive and Cohesive force 2.22 Surface energy and surface tension 2.23 Surface tension in daily life. 2.24 Rise of liquid in capillary tube (no derivation of formula) 2.3 Viscosity 2.31 Coefficient of viscosity, Newton's law of viscosity 2.32 Streamline and turbulent flow 2.33 Reynolds number and it's significance 2.34 Stoke's law	2.1 Types of Forces.
SO2.2 Explain gravitational forces and value of 'g' at different place.	LE2.2 Determine the Surface tension of water by capillary rise method.		2.2 Escape velocity
SO2.3 Select a given fluid on the basis of surface tension and viscosity.	LE2.3 Determine terminal velocity of given object by Stoke's law apparatus.		2.3 Orbital Velocity
	LE2.4 Comparison of viscosity of different liquids.		2.4 Weightlessness in lifts
			2.5 Excess pressure inside bubble
			2.6 Poiseuille's method

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self-Learning

SW-2 Suggested Sessional Work (SW):**a. Assignments:**

- i Find the value of 'g' at different locations of India and justify the reasons for variations.
- ii Explore the different value of 'g' in different planet.
- iii Explore the use of different liquid on the basis of their viscosity.

b. Mini Project:

- i Prepare an elastic band powered boat.
- ii Prepare a force & motion projects (making paper airplane/parachute with different design and organize contest)

c. Other Activities (Specify):

- i Seminar on factors affecting g.
- ii Seminar on weightlessness in lifts and space.

CO 3 Solve engineering problems by applying the principle of ray optics.

(Approx. Hrs: CI+ LI+SW+SL = 18)

Session Outcomes (SOs)	Laboratory Instruction (LI or P)	Class room Instruction (CI or L)	Self-Learning (SL)
SO3.1 Comparison of images of an object placed in different distance from lens. SO3.2 Explain the phenomena of total internal reflection in optical fiber. SO3.3 Select materials on the basis of refractive index.	LE3.1 Calculate refractive index of material of glass slab. LE3.2 Calculate refractive index of material of glass prism. LE3.3 Calculate focal length of convex lenses accurately. SO3.4 To determine focal length of combination of two lenses. SO3.5 Verification of Snell's law	Unit-3.0 General Optics 3.1 Refraction 3.11 Refraction through multiple media & Law of reversibility of light. 3.12 Refraction through lenses at different positions, real and virtual image 3.13 Refraction through prism, formula for thin prism 3.14 Total internal reflection of light, critical angle, relation between critical angle and refractive index 3.2 Pure and impure spectrum 3.3 Optical fiber	3.1 Concept of simple & compound microscope 3.2 Concept of terrestrial telescope 3.3 Electromagnetic spectrum: the entire distribution of E-M radiation according to frequency and wavelength.

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self-Learning

SW-3 Suggested Sessional Work (SW):**a. Assignments:**

- i Write detail method of finding refractive index of liquid using hollow prism.

ii Prepare detail report on the frequency range of electromagnetic waves interaction in daily life.

b. Mini Project:

- i Prepare working model to demonstrate the TIR in Optical fiber.
- ii Prepare model of microscope with house hold materials and lenses.

c. Other Activities (Specify):

- i Visit to BSNL like organizations to observe the role of optical fibers in communication.
- ii Seminar on industrial application of Optical fiber.
- iii Seminar on the Optical communication.

CO-4 Apply concepts of electricity and magnetism to solve engineering problems.

(Approx. Hrs: CI+ LI+SW+SL- 18)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO4.1 Explain Coulomb's law, Electric potential and electric field for given charge distribution. Use Ohm's law for different combinations of resistances to calculate current and potential difference. SO4.3 Calculation of specific resistance of a conductor. SO4.4 Apply knowledge of magnetic field in a given situation.	LE4.1 To determine the resistance of a conductor by applying Ohm's law. LE4.2 To determine the power consumption in resistive load using voltmeter and ammeter. LE4.3 To draw the magnetic lines of force of a bar magnet keeping its N-pole pointing to magnetic north of the earth (N-N). Locate neutral points. LE4.4 To draw the magnetic lines of force of a bar magnet keeping its S-pole pointing to magnetic north of the earth (N-S). Locate neutral points.	Unit-4.0. Basic of Electricity and Magnetism 4.1 Static Electricity 4.11 Electric Charge, Coulomb's law, Electro static potential 4.2 Current Electricity 4.21 Current, Voltage, Resistance, Specific resistance & conductivity 4.22 Ohm's Law 4.23 Relation between voltage, current & power in electrical circuit. 4.3 Magnetism 4.31 Magnetic pole strength and Coulomb's inverse square law for magnets 4.32 Magnetic flux and magnetic field intensity 4.4 Electromagnetism- linkage magnetic flux of an EMF in a coil (Faraday's law)	4.1 Factor affecting resistance of a conductor 4.2 Applications of Ohm's law 4.3 Equipotential surface and its physical significance 4.4 Electric lines of force 4.5 Comparison of materials having different magnetic properties

SW-4 Suggested Sessional Work (SW):

a. Assignments:

- i Prepare list of objects/ Material with different specific resistance.

- ii Analyze the role of resistance on series and parallel combination.
- iii Prepare list of house hold appliances and Labs instruments/ equipment's that commonly use Magnets include.
- iv Application of specific resistance in daily life.

b. Mini Project:

- i Collect some resistance from nearby electrical shops and measure its value using multi-meter and color code.
- ii Prepare circuits with LED to illustrate the series and parallel combination of resistance.

c. Other Activities (Specify):

- i Seminar on applications of resistance.
- ii Calculate domestic monthly electricity bill.

**CO- 5 Solve engineering problems by applying the knowledge of modern physics.
(Approx. Hrs: CI+ LI+SW+SL- 18)**

Session Outcomes (SOs)	Laboratory Instruction (LI or P)	Class room Instruction (CI or L)	Self-Learning (SL)
SO5.1 Apply the knowledge of photoelectric effect in a given situation. SO5.2 Compare laser with other sources of light. SO5.3 Explain the working principle and applications of ultrasonic sensor.	LE5.1 Calculate the work function of given photoelectric materials. LE5.2 Calculate the divergence of given laser. LE5.3 To verify inverse square law of light using photocell.	UNIT 5. Modern Physics 5.1 Photoelectric effect 5.2 Laws of photoelectric emission, photoelectric effect and threshold frequency. 5.3 Einstein's photoelectric equation. 5.3 Laser 5.41 Spontaneous and stimulated emission 5.42 Population inversion, pumping methods, active medium and resonance cavity. 5.43 Ruby Laser 5.4 Ultra-sonics 5.51 Frequency range 5.52 Production of ultrasonic waves using Piezo electric method 5.53 Properties of ultra-sonic waves. 5.54 Applications of ultra-sonic waves.	a. Photo cell b. Different types of lasers.

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others),LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self-Learning

SW-5 Suggested Sessional Work (SW):

a. Assignments:

- i. Analyze different medical applications of ultrasonic waves.
- ii. Prepare list of type of laser used in office and house hold devices.

b. Mini Project:

- i. To design a working model for the production of ultra-sonics.
- ii. Determine the divergence of key chain laser purchased from local market.

c. Other Activities (Specify):

- i. Seminar on industrial applications of ultra-sonics.
- ii. Seminar on applications of photoelectric effect.
- iii. Seminar on engineering applications of laser.

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Specification Table (For ESA of Classroom Instruction):

Unit Number	Unit Title	Marks Distribution			Total Marks
		R	U	A	
I	Units, Measurement and Error analysis	6	6	8	20
II	Forces Gravitation and General Properties of fluids	6	6	8	20
III	General Optics	6	6	8	20
IV	Basic Electricity and Magnetism	6	6	8	20
V	Modern physics	6	6	8	20
Total					

Legend: R: Remember, U: Understand, A: Apply and above.

1.1 Open-source software and website address:

- 1.11 www.sparknotes.com(Magnetic flux)
- 1.12 www.sparknotes.com(magnetic field intensity)
- 1.13 www.britannica.com (Laser)
- 1.14 www.britannica.com (Photoelectric effect)
- 1.15 www.quarktwin.com (Ohm's Law)
- 1.16 <https://ncert.nic.in>

Others:

- 1.17 Learning Packages
- 1.18 Lab Manuals
- 1.19 Manufacturer's Manual
- 1.110 User's Guide

LIST OF EXPERIMENTS –

- SO1.1 To determine the volume and density of a given bar using Vernier calliper.

- SO1.2 To measure the Diameter of various wires using screwgauge.
- SO1.3 To measure radius of curvature of a given curved surface using a Spherometer.
- SO2.1 To determine the value of “g” using a simple pendulum.
- SO2.2 To determine surface tension of water by capillary rise method.
- SO3.1 To determine the refractive index of Glass slab.
- SO3.2 To determine the refractive index of the material of the prism using a graph.
- SO3.3 To determine focal length of concave mirror & convex lens.
- SO3.4 To determine focal length of combination of two lenses.
- SO3.5 To verify Snell’s law.
- SO4.1 To verify Ohm’s Law
- SO4.2 To measure the resistivity of the material of the wire.
- SO4.3 To plot magnetic lines of force in N-N condition.
- SO4.4 To plot magnetic lines of force in N-S condition.
- SO5.1 To calculate the work function of given photoelectric materials.
- SO5.2 To calculate the divergence of a given laser.
- SO5.3 To verify the inverse square law of light using a photocell.

REFERENCE BOOKS –

1. 1. Applied Physics Vol. I &II H.C. Saxena & Prabhakar Singh
2. 2. Engineering Physics – BVN Rao
3. 3. Principles of Physics – K.K. Mohindroo
4. 4. Basic Principles of Physics – Brij Lal Subramanyam .
5. 5. Physics Two K.C Sharma Deepak Prakashan
6. 6. Engineering Physics – RK Gaur & SL Gupta.



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)
Diploma (Common to All Branches)
(Semester- II)

- A) **Course Code** : **2000B02AT020**
 B) **Course Title** : **Fundamentals of Civil and Mechanical Engineering**
 C) **Pre- requisite Course Code and Title:**
 D) **Rationale :**

Civil engineering is basically concerned with planning, design and construction for environmental control, development of natural resources, buildings, transportation facilities and other structures required for health, welfare, safety, employment and pleasure of mankind. Civil engineering is a wide field and contributes to infrastructure development, safe and sustainable living, providing clean water and sanitation, environmental conservation and driving economic growth.

Mechanical Engineering is one of the oldest and most diverse branches of engineering which deals with design, development, manufacturing and maintenance of machines, tools and mechanical systems. It combines creativity, knowledge and analytical tools to shape an idea into reality by using the principles of motion, energy and force.

This curriculum is developed to impart the knowledge of basics of civil and mechanical engineering thereby giving an insight into their contributions to the society.

E) Course Outcomes:

- CO-1 Identify appropriate construction material according to requirement.**
- CO-2 Understand the basics of surveying.**
- CO-3 Identify and understand basic structural components.**
- CO-4 Understand and apply basic principles of applied mechanics.**
- CO-5 Understand engineering materials (ferrous, non-ferrous and alloys) to select appropriate material.**
- CO-6 Understand basic principles of Thermodynamics.**

Scheme of Studies:

Board of Study	Course Code	Course Title	Periods Per Week			Scheme of Examination			Total Marks	Credits
			L	T	P	Theory/Lab				
						ESE	CT	TA		
Mechanical Engineering	2000B02AT020	Fundamentals of Civil and Mechanical Engineering	2	2	-	100	20	20	140	4

Legend:L: Classroom Instruction,T: Tutorial (T) and P: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies) ESE: End Semester Examination, CT: Class Test, TA: Teachers Assessment

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction, Laboratory Instruction), Sessional Work and Self Learning. Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1: Identify appropriate construction material according to requirement.(10 Hrs)

Session Outcomes	Laboratory Instruction	Class room Instruction (Self Learning
SO1.1 Explain the classification of bricks. SO1.2 Describe the various types of cement, their manufacture, properties and uses. SO1.3 Identify the various types of stones.		Unit-1.0 Building Materials 1.1 Classification of bricks, dimensions of modular and traditional bricks, Good brick earth, moulding, characteristics of good bricks, compression test and absorption test. 1.2 Constituents of cement, types of cement, wet process for manufacture of Portland cement, initial and final setting times, use of Vicat needle apparatus, distinctions between ordinary Portland cement, Pozzolana cement and slag cement, grades of cement, white cement, uses of cements. 1.3 Stone: Geological, physical and chemical classification of stone, important stones, uses of stone.	SL1.1 Field test on Bricks. SL1.2 Explain detailed procedure of manufacturing ng of bricks. SL 1.3 Explain air entraining cement, calcium chloride cement, water repellent cement, water proof cement. SL 1.4 Explain Physical & Chemical Properties of Cement.

SW-1 Suggested Sessional Work (SW):

Assignments:

1. List the ingredients of Portland cement? State the function and limits of each of them.
2. Describe with the help of flow charts the dry and wet process of manufacturing cement.
3. Enlist different types of cements and conditions of uses.
4. Elaborate the initial and final setting times of cement? Give their importance?
5. State the ingredients of a good brick.
6. Describe the common defects in bricks.
7. Classify bricks as per BIS: 1077.
8. Explain frog in brick? State its importance in clay bricks.
9. Describe briefly the tests of bricks may be required before using them for construction.
10. State properties of fly ash bricks.

Mini Project:

1. Collect data of various brands and grades of Ordinary Portland cement available in the market and give their Physical & Chemical Properties.
2. Give the typical grading of fine aggregate and coarse aggregate to be used for concreting and road work.

Other Activities (Specify):

1. List the properties of good cement on the basis of physical examination.

CO-2 Understand basics of surveying.

(10 Hrs)

Session Outcomes	Laboratory Instruction	Class room Instruction	Self Learning
SO2.1 Explain the need of survey. SO2.2 Explain the method of chain survey SO2.3 Explain the method of compass survey.		Unit-2.0 Surveying 2.1 Chain Survey: Need of survey, Instruments used, Types of chain and tapes. Selection of survey-stations. Chain-lines, Off-sets, Oblique- offsets, Tie-lines, Check-lines. Ranging. Field-Book, Plotting. 2.2 Compass Survey: The prismatic compass & surveyors compass. Definition and types of meridian. Dip and Declination. Whole circle bearing, Fore bearing and Back bearing.	SL2.1 Classification of Survey based on nature of the field and based on the object of survey. SL2.2 Comparison between surveyor and prismatic compass. SL2.3 Study of variation of earth magnetic field and Declination.

SW-2 Suggested Sessional Work (SW) :

Assignments:

1. Identify and prepare a list of tools and equipment used in chain and Tape surveys.
2. Explain with neat diagram the construction and working of Optical Square, Prism Square and Cross Staff
3. Explain a well-conditioned triangle and its necessity in field measurement.
4. Identify errors and their corrective measures in chain surveys.
5. Describe with the help of a neat sketch prismatic compass and surveyors compass.
6. Compare prismatic compass and surveyors compass
7. Identify errors and their corrective measures in compass survey.
8. Explain local attraction in compass surveying.

Mini Project:

1. Compute area of the field with the help of chain survey and record the data in field book.
2. Take a simple closed traverse of 5-6 sides. Calculate included angles, locate details and plot them on a drawing sheet.

CO- 3 Identify and understand basic structural component.

(10 Hrs)

Session Outcomes	Laboratory Instruction	Class room Instruction (CI)	Self-Learning
SO3.1 Explain the necessity of foundations and associated terms. SO3.2. Explain the different types of estimates.		Unit-3.0 Foundations and Estimates 3.1 Necessity of foundations, Bearing Capacity, safe bearing capacity, ultimate bearing capacity. Types of foundations, Sketches of spreads footing for walls, rectangular R.C.C. footing for columns and raft-foundations for a group of columns. 3.2 Type of estimate, estimate of simple building of two rooms.	SL3.1 Study of different types of bonds in brick masonry. 3.2 Compare the results different types of approximate estimates.

SW-4 Suggested Sessional Work (SW) :

Assignments:

1. State the requirements of a good foundation?
2. Enumerate different types of foundations you would recommend under different situations.
3. Write advantages and disadvantages of precast concrete piles.
4. Draw a typical sketch of under-reamed pile foundation along with the grade beam

5. Sketches of spread and stepped footing.
6. What is specification? Differentiate general specification and detailed specification.
7. Write General Specification of a First Class Building.
8. Write detailed Specification of cement concrete 1:2:4
9. Explain estimate.
10. Explain the difference between approximate estimate and detailed estimate.
11. Explain Service unit method, Plinth area method, and Cubic content method of approximate estimate.
12. Work out the approximate estimate for a building of 1000 sq m by different approximate methods observing the cost of construction of similar building in the vicinity.

Mini Project:

1. Study nearby civil engineering structure and identify different types of foundation and masonry in different buildings.
2. Visit PWD office of your area and observe the cost of construction of a state highway then give approximate estimate for a new state highway road for 10 km length

CO- 4 Apply basic principles of applied mechanics. (10 Hrs)

Session Outcomes	Laboratory Instruction	Class room Instruction	Self Learning
SO4.1 Explain the different types of forces and their effects on objects. SO4.2 Determine the effects of friction. SO4.3 Determine CG and MI of different shapes		Unit 4- Basics of Applied Mechanics 4.1 Definition and importance of Applied Mechanics, Overview of Statics and Dynamics 4.2 Types of Forces, External, Internal, and Concurrent Forces 4.3 Types of Force Systems, Resolution of Forces into Components 4.4 Equilibrium of a Body, Conditions for Static Equilibrium ($\Sigma F = 0$, $\Sigma M = 0$), Free Body Diagram (FBD) 4.4 Analysis of a Simple Structure (Trusses, Beams) 4.5 Types of Friction: Static, Kinetic,	

Session Outcomes	Laboratory Instruction	Class room Instruction	Self Learning
		Rolling, Laws of Friction, Coefficient of Friction and its Application in Design (Wedges, Belts, Inclined Plane) 4.6 Definition and Physical Significance of CG and MI	

SW-4 Suggested Sessional Work (SW) :

- a. Assignments:
 - i. Resolve the forces in a given situation.
 - ii. Draw the free body diagram of the hanging rod of a running ceiling fan.
 - iii. Solve numerical problems related to co-efficient of friction, angle of friction, angle of repose and force of friction in different situations.
 - iv. Find out Area Moment of Inertia of a solid circular wheel at the point of contact with the road.
 - v. Find out Area Moment of Inertia of any rectangular shaped calendar at the point of hinge/suspension on the wall.

- b. Mini Project:
 - i. Prepare a list of engineering components where friction is desirable and undesirable and also suggest ways to improve and reduce it respectively.
 - ii. Prepare a chart to show CGs locations of cross sections of different standard Mild steel pipe and rod sections available in the market.
 - iii. Select two stationary components from day to day life and try to identify all the forces acting on them in magnitude and direction.

CO- 5 Understand engineering material and their properties(ferrous, non-ferrous and alloys) to select appropriate material.(10 Hrs)

Session Outcomes	Laboratory Instruction	Class room Instruction	Self Learning
<p>SO5.1 Classify engineering materials.</p> <p>SO5.2 Explain the properties of engineering materials.</p> <p>SO5.3 Explain the factors affecting the selection of materials.</p> <p>SO5.4 Conduct testing of materials.</p>		<p>Unit-5.0 Engineering Materials and their properties</p> <p>5.1 Classification of Materials(Metals and Non-Metals)</p> <p>5.2 Properties of materials-Mechanical, Physical, Chemical</p> <p>5.3 Factors Affecting Material Selection in Engineering Design</p> <p>5.4 Stress-Strain behavior and Elastic Modulus, Concept of Yield Strength, Ultimate Strength, and Fracture Toughness, Fatigue, Creep and Corrosion Resistance in Engineering Materials.</p> <p>5.5 Testing of Materials: Destructive and Non-destructive testing, Brinell and Rockwell Hardness test, Impact tests – Charpy and Izod tests, Magnetic particle crack detection test, Dye penetration test, Ultrasonic test, Radiography test, Eddy current test</p>	

SW-5 Suggested Sessional Work (SW) :

Assignments:

- i. Draw the stress-strain curves for different brittle and ductile materials.
- ii. Explain the yield point phenomena and its importance.
- iii. List the factors that affect the selection of material for a particular application.

- iv. Enlist the advantages of non-destructive testing of materials over destructive testing of materials.

Mini Project:

- i. Determine the hardness of different materials/metallic components and compare hardness and plot a bar chart to show the hardest and softest material,

CO- 6 Understand and apply basic principles of Thermodynamics(10 Hrs)

Session Outcomes	Laboratory Instruction	Class room Instruction	Self-Learning
SO6.1 Define and identify the thermodynamic system. SO6.2 Understand and apply the laws of thermodynamics SO6.3 Identify the thermodynamic Process Understand and apply the laws of thermodynamics SO6.4 Define and identify the modes of heat transfer. SO6.5 Explain thermodynamic cycles.		Unit-6.0 Principles of Thermodynamics 6.1 Introduction to Thermodynamics-Basic Definitions: System, Surroundings 6.2 State, Process, Types of Systems: Open, Closed, and Isolated, 6.3 Properties of a Thermodynamic System Intensive vs. Extensive 6.4 Thermodynamic Laws 6.5 Thermodynamic processes – constant pressure, constant temperature, constant volume, adiabatic and isentropic processes 6.6 Heat Transfer Methods: Conduction, Convection, Radiation 6.7 Specific Heat Capacities and Their Use in Energy Calculations, 6.8 Thermodynamic Cycles-Otto and Diesel cycle, Applications of Thermodynamics	

SW-5 Suggested Sessional Work (SW) :

- c. Assignments:
- List the devices which convert heat into work.
 - List the real life examples of open and closed systems.
 - Compare Otto and Diesel cycles.
 - Enlist different extensive and intensive properties.
- d. Mini Project:
- Identify the various modes of heat loss in a petrol engine.

I) Suggested Specification Table (For ESA of Classroom Instruction):

Unit Number	Unit Title	Marks Distribution			Total Marks
		R	U	A	
I	Building Materials	5	10	5	20
II	Surveying	5	5	5	15
III	Foundation & estimate	5	5	5	15
IV	Basics of Applied Mechanics	5	10	5	20
V	Engineering Materials and their properties	5	5	5	15
VI	Principles of Thermodynamics	5	5	5	15
Total		30	40	30	100

Legend: R: Remember, U: Understand, A: Apply and above

K) Suggested Instructional/Implementation Strategies:

- Improved Lecture
- Tutorial
- Case Method
- Group Discussion
- Industrial visits
- Industrial Training
- Field Trips
- Portfolio Based Learning
- Role Play
- Demonstration
- ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
- Brainstorming
- Others

L) Suggested Learning Resources:

(a) Books :

S. No.	Title	Author	Publisher	Edition & Year
1.	Material Science and Metallurgy	O. P. Khanna	DhanpatRai& Sons	ISBN: 9788189928315
2.	Materials Science and Metallurgy	R. K. Rajput	S. K. Kataria& Sons	ISBN: 9789350144183
3.	Materials Science & Engineering	V. Raghvan	PHI	ISBN: 8120324552
4.	Materials Science	R. S. Khurmi	S Chand	ISBN:9788121901468
5.	Materials Science	G. K. Narula, K. S. Narula, V. K. Gupta	TMH	ISBN: 0074517961
6.	Material Science & Metallurgy	U. C. Jindal	Pearson	ISBN: 9788131759110
7.	Fundamentals of Materials Science & Engineering	William D. Callister David G Rethwisch	Jhon Wiley & Sons	ISBN : 13 9781118287989
8.	Building Materials	S. C. Rangwala	Charotar Publications	ISBN : 9789385039775
9.	Surveying Vol I	B. C. Punamia	Laxmi Publications	ISBN: 9788170088530
10.	Quantity Surveying and Costing	B. N. Dutta	CBS Publishers & Distributors	ISBN: 978-8174767707
11.	आवेदनिक यांत्रिकी (Applied Mechanics)	बी.बी.गोकुलदास, वंदना सोमकुंवर	खन्ना पब्लिशर्स	
12.	तापीय अभियांत्रिकी (Thermal Engineering)	एस.एस.एल. पटेल	स्टैंडर्ड पब्लिशर्स	
13.	सामग्री विज्ञान और अभियांत्रिकी (Materials Science and Engineering)	वाई. डी. शर्मा, आर. पी. गर्ग	स्टैंडर्ड पब्लिशर्स	

(b)Open source software and website address:

1. NPTEL Course- <http://nptel.ac.in/courses/113106032/>
2. Plastic deformation -<https://www.youtube.com/watch?v=Oz8fW68RY6I>
3. Properties and Structure of Engineering Materials-
https://www.youtube.com/watch?v=uG35D_euM-0
4. Plastic deformation- <https://www.youtube.com/watch?v=Oz8fW68RY6I>
5. Phase diagrams- <https://www.youtube.com/watch?v=m9O2LzwnxSY>
6. Metallic Materials
<https://www.youtube.com/watch?v=uh4obOPtppw&list=PL8bFJyqxQ9otr7r3gGoZ2Hvl-3c8q6Q8A>
7. Non-metallic Materials-<https://www.youtube.com/watch?v=ssLOujezko>
8. Heat treatment of Steels-<https://www.youtube.com/watch?v=Jt8pYX4nVSo>
9. Testing of Materials
<https://www.youtube.com/watch?v=tpGhqQvftAo&list=PL1XvQlloG76jRFOxUiWAcM4BsnSX>

N) Mapping of POs & PSOs with COs:

Course Outcomes (COs) Titles	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	Basic knowledge PO-1	Discipline knowledge PO-2	Experiments & Practice PO-3	Engineering Tools PO-4	The Engineer & Society PO-5	Environment & Sustainability PO-6	Ethics PO-7	Individual & Team work PO-8	Communication PO-9	Life Long learning PO-10	PSO-1	PSO-2
CO-1 Interpret properties and characteristics of various building materials.	√	√	√	√	√	√	√	√	√	√		
CO-2 Conduct survey using chain and prismatic compass.	√	√	√	√	-	√	-	√	√	√		
CO-3 Demonstrate different types of foundations and prepare simple estimates.	√	√	√	√	√	-	√	√	√	√		
CO-4 Apply basic principles of applied mechanics.	√	√	√	√	-	-	-	√	√	√		
CO-5 Understand engineering material and their properties (ferrous, non-ferrous and alloys) to select appropriate material.	√	√	√	√	-	-	-	√	√	√		
CO-6 Understand and apply basic principles of Thermodynamics	√	√	√	√	-	-	-	√	√	√		

O) Course Curriculum Map:

POs & PSOs No.	COs No.& Title	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
PO-1,2,3,4,7,8,9,10 PSO 1,2,3	CO-1 Interpret properties and characteristics of various building materials.	SO1.1 SO1.2 SO1.3 SO	LE1.1 LE1.2 LE1.3 LE1.4 LE1.5	Unit 1.0 Building Materials 1.1, 1.2, 1.3	SL1.1 SL1.2 SL1.3 SL1.4
PO- 1,2,3,4,8,9,10 PSO 1,2,3	CO-2 Conduct survey using chain and prismatic compass.	SO.2.1 SO.2.2 SO2.3	LE2.1 LE2.2 LE2.3	Unit 2.0 Surveying 2.1, 2.2	SL2.1 SL2.2 SL2.3
PO- 1,2,3,4,8,9,10 PSO 1,2,3	CO-3 Demonstrate different types of foundations and prepare simple estimates.	SO.3.1 SO3.2 SO3.3	LE3.1 LE 3.2 LE3.3	Unit 3.0 Building and Estimate 3.1, 3.2	SL3.1 SL3.2
PO- 1,2,3,4,8,9,10 PSO 1,2,3	CO-4 Apply basic principles of applied mechanics.	SO4.1 SO4.2 SO4.3	LE4.1 LE4.2	Unit 4.0 Basics of Applied Mechanics 4.1, 4.2, 4.3, 4.4, 4.5, 4.6	
PO- 1,2,3,4,8,9,10 PSO 1,2,3	CO-5 Understand engineering material and their properties(ferrous, non-ferrous and alloys) to select appropriate material.	SO5.1 SO5.2 SO5.3 SO5.4	LE5.1 LE5.2 LE5.3 LE5.4 LE5.5 LE5.6	Unit 5.0 Engineering Materials and their Properties 5.1, 5.2, 5.3, 5.4, 5.5	
PO- 1,2,3,4,8,9,10 PSO 1,2,3	CO-6 Understand and apply basic principles of Thermodynamics	SO6.1 SO6.2 SO6.3 SO6.4 SO6.5	LE6.1 LE6.2	Unit 6.0 Principles of Thermodynamics 6.1, 6.2, 6.3,6.4, 6.5, 6.6, 6.7, 6.8	

Legend:CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others) , LI : Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-II

- A) **Course Code** : 2000B03AT028
- B) **Course Title** : Fundamentals of Electrical & Electronics Engineering
- C) **Pre-requisite Course Code and Title** : Science + Math's (Level 3)
- D) **Rationale:**

Electrical and Electronic components and circuits are integral part of most of the instruments, consumer gadgets, and automobile and Industrial control/automation systems. The course is classified under basic technology group and is intended to enable the students to identify the different types of active and passive elements, the fundamental concept of electrical and magnetic circuit and test the working of basic electronics circuits like: rectifiers, filters, amplifiers oscillators and their applications in the various electronic circuits. The course will also help the student in acquiring investigation skill when he/she will be working as technician.

E) **Course Outcomes:**

CO-1: Identify and select appropriate passive and active elements

CO-2: Interpret Electrical and Magnetic Circuits

CO-3: Test the function of PN Junction diodes and Special diodes

CO-4: Test the working of Bipolar Junction Transistor (BJT) and FET

CO-5: Use Number systems & logic gates to perform basic digital circuit operations.

F) **Scheme of Studies:**

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Total Credits(C) L+T+(P/2)
1	Electronics & Telecommunication Engineering	2000B03AT028	Fundamentals of Electrical & Electronics Engineering	2	--	1	3

Legend:L-Lecture,P-Practical,T-Tutorial

G) **Scheme of Assessment:**

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory					Total Marks
				ESE	CT	TA			
1	Electronics & Telecommunication Engineering	2000B03AT028	Fundamentals of Electrical & Electronics Engineering	100	20	20			140

Legend: ESE-End Semester Examination, CT-Class test, TA-Teachers' Assessment

Note: Separate passing is must for Progressive and End Semester Assessment.

- H) Course-Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Class room Instruction (CI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1. Identify and select appropriate passive and active elements

(Approx. Hrs: CI+LI+SW+SL=09)

Session Outcomes (SOs)	Classroom Instruction (CI)	Self-Learning (SL)
<p>SO 1.1 Classify the given components into active and passive.</p> <p>SO1.2 Differentiate between the voltage-current characteristics of the given type of voltage source</p> <p>SO 1.3. Differentiate linear and nonlinear element using Ohms law.</p> <p>SO 1.4 Differentiate types of energy storage elements</p> <p>SO 1.5 Determine resistor, capacitor and inductor values using color coding</p>	<p>Unit1.0 Active and passive elements</p> <p>1.1 Ideal voltage and current sources, V-I characteristic of ideal and practical voltage and current sources</p> <p>1.2 charge, current, voltage or potential difference, electrical ground, electric power resistance conductance resistivity. Linear and nonlinear element</p> <p>1.3 Ohm's law, open circuit and short circuit types of resistor and resistor color code</p> <p>1.4 Energy storage circuit elements ideal capacitor capacitance I-V relation of capacitor, types of capacitor, colour coding of capacitor</p> <p>1.5 Ideal inductor inductance I- V relation of inductor, type of inductors and color coding of inductor</p>	<p>Sketch the symbols of different types of resistors</p> <p>Compare the rating of the different types of active and passive components</p>

SW-1 Suggested Sessional Work (SW):

a. Assignments:

- i. Test the V-I characteristic of a carbon resistor and a wire wound resistor.
- ii. Justify that a semiconductor diode is a unilateral element.
- iii. Justify that the transmission line is a bilateral element

b. Mini Project:

- i. Connect two identical battery sources in parallel/series and measure the voltage across the terminal and interpret the results.
 - i. Measure the resistance value of a given series and parallel connected resistors and interpret the result

c. Other Activities(Specify):

- i. Prepare a chart illustrating the different types of linear and nonlinear elements
- ii. Prepare a chart showing the colour coding of resistors
- iii. Prepare a chart showing the different types of commercially available inductor and capacitors

CO-2. Interpret Electrical and Magnetic Circuit

(Approx.Hrs:CI+LI+SW+SL=09)

Session Outcomes (SOs)	Classroom Instruction (CI)	Self-Learning (SL)
<p>SO2.1 Determine the number of mesh, loop, branch and node in a given Electrical circuit.</p> <p>SO2.2 Determine the current and voltage of a given Electrical circuit.</p> <p>SO2.3 Measure the equivalent resistance of a given series parallel resistor circuit.</p> <p>SO 2.4 Measure the equivalent inductance or capacitor of a given series/parallel inductor capacitor circuit.</p> <p>SO2.5 Apply KVL and KCL to determine the current voltage and power of a given electrical circuit</p> <p>SO2.6 Determine the equivalent inductance of two magnetically coupled coils</p>	<p>Unit2.0 Fundamentals of Electric Circuits</p> <p>2.1 Electrical Network, branch loop, mesh, node.</p> <p>2.2 Kirchoff's Voltage Law (KVL) and Kirchoff's current law (KCL)</p> <p>2.3 Series resistors and the voltage divider rule, parallel resistors and current divider rule.</p> <p>2.4 Inductors and capacitors in series and parallel</p> <p>2.5 Passive sign convention for power absorbed and dissipated</p> <p>2.6 Use of KCL KVL to determine voltage current and power in simple series and parallel circuit.</p> <p>2.7 Concept of Magnetic field and flux linkage, Types of Electromotive forces Magnetic coupling , Self and mutual inductances</p>	<p>Prepare a chart showing the different types of magnetic materials and draw their B-H curve</p>

SW-2 Suggested Sessional Work (SW):

a. Assignments:

- i. Solve simple series parallel resistor network to determine the current and voltage using Kirchoff's law

b. Mini Project:

- i. Determine the voltage, current and power of a given resistor circuit and validate it by using measuring instruments that the power delivered equals the power dissipated.
- ii. Measure the time taken by the capacitor to charge to its rated value for a given RC series circuit energized by a DC voltage and interpret the results for different values of the series connected resistor

c. Other Activities (Specify):

Interpret why the voltmeter must be placed in parallel with the element whose voltage it is measuring and similarly the ammeter must be placed in series with the element whose current it is measuring

CO-3 Test function of PN Junction diodes and Special diodes

(Approx.Hrs:CI+LI+SW+SL=09)

Session Outcomes (SOs)	Classroom Instruction (CI)	Self-Learning (SL)
<p>SO3.1: Describe the types of semiconductors (Intrinsic and Extrinsic) and their charge carriers.</p> <p>SO3.2: Explain the formation of a P-N junction, its behavior under forward and reverse bias, and its I-V characteristics.</p> <p>SO3.3: Analyze the working principle and applications of rectifier circuits</p> <p>SO3.4: Describe the working principle and applications of Special Diodes</p>	<p>Unit3.0 Semiconductor Materials and Diode Devices</p> <p>3.1 Semiconductors: Types: Intrinsic, Extrinsic, charge carrier & conductivity</p> <p>3.2 P-N Junction Diode: Formation of P-N junction, behavior under forward and reverse bias, I-V characteristics, working principle & Application of Diodes: Rectifiers (Half-wave, Full-wave)</p> <p>3.3 Special Diodes: Zener, LED, Photodiode. (Working Principle & Application)</p>	<p>Compare different types of semiconductor materials (Silicon, Germanium, Gallium Arsenide) and their applications.</p>

SW-3 Suggested Sessional Work (SW):

a. Assignments:

- i. Differentiate between Conductors, Semiconductors, and Insulators based on energy band diagrams.
- ii. Compare the working of Half-wave and Full-wave rectifiers with wave forms and efficiency calculations.
- iii. Explain the Zener break down and Avalanche breakdown phenomenon with graphs.
- iv. Explain how different LED colors are produced and the role of semiconductor materials in determining the LED's wave length.
- v. Compare the efficiency, voltage drop, and applications of different types of LEDs (Red, Green, Blue, White, Infrared, and UV LEDs).

b. Mini Project:

- i. Design and test a Full-wave rectifier circuit using a PN junction diode.
- ii. Design a circuit using a photo diode to turn on an LED based on light intensity.
- iii. Design a Zener diode-based voltage regulator circuit and test its stability.
- iv. Create a Zener-based over voltage protection circuit.

CO-4 Test the working of Bipolar Junction Transistor (BJT) and FET.

(Approx.Hrs:CI+SW+SL=09)

Session Outcomes (SOs)	Classroom Instruction (CI)	Self-Learning (SL)
<p>SO4.1: Describe the construction and working principle of NPN and PNP BJTs.</p> <p>SO4.2: Explain the modes of operation of a BJT (Active, Cut-off, and</p> <p>SO4.3: Describe the construction, working principle, and applications of JFET</p> <p>SO4.4: Describe the construction, working principle, and applications of MOSFET.</p>	<p>Unit4.0 Bipolar Junction Transistor (BJT) and Field effect transistor (FET)</p> <p>4.1 BJT: Types of BJT; Working Principle, Mode of Operation, Application of BJT as Amplifier, Switch.</p> <p>4.2 Field Effect Transistor (FET) : Construction, working principle, Schematic Symbol</p> <p>4.3 Metal Oxide FET: Types of MOSFET, Construction, working principle, Schematic Symbol (Enhancement type).</p>	<ul style="list-style-type: none"> • Understand the importance of Heat Sink in power transistors and MOSFETs

SW-4 Suggested Sessional Work (SW):

a. Assignments:

- i. Prepare a table comparing the advantages and disadvantages of BJT, JFET, and MOSFET.
- ii. Compare the applications of BJT and MOSFET in amplifier and switching circuits
- iii. Prepare a chart to describe the working principle of FET.
- iv. Enlist the technical specifications of FET.

b. Mini Project:

- i. Design a common-emitter amplifier and measure its voltage gain.
- ii. Implement a BJT-based switching circuit for controlling an LED or motor.
- iii. Build and test a simple JFET voltage regulator circuit.
- iv. Use a MOSFET to control the speed of a DC motor.

CO-5 Use Number system & logic gate to perform basic digital circuit operation.

(Approx. Hrs:CI+SW+SL=09)

Session Outcomes (SOs)	Classroom Instruction (CI)	Self-Learning (SL)
<p>SO5.1: Explain the importance and types of number systems used in Digital Electronics.</p> <p>SO5.2: Perform number system conversions.</p> <p>SO5.3: Explain the working principles of basic logic gates with truth table.</p> <p>SO5.4: Demonstrate the functionality of universal logic gates.</p>	<p>UNIT5.0 Number Systems & Logic Gates</p> <p>5.1 NUMBER SYSTEM: Importance of Number System, Types of Number Systems: Binary, Decimal, Octal, Hexadecimal</p> <p>5.2 Number System Conversions: Binary to Decimal and Decimal to Binary, Binary to Hexadecimal, Binary to Octal</p> <p>5.3 Logic Gates: Basic Logic Gates: AND Gate, OR Gate, NOT Gate. Universal Logic Gates: NAND Gate, NOR Gate</p>	<p>Study the application of logic gates in real-world electronic circuits.</p>

Legend: CI: Class room Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-5 Suggested Sessional Work(SW):

a. Assignments:

- i. Prove that NAND and NOR gates are universal gates by implementing AND, OR, and NOT functions.
- ii. List the rules for converting Binary to Decimal, Decimal to Binary, Binary to Hexadecimal, and Binary to Octal.
- iii. List the practical applications of logic gates in real-world electronic devices.
- iv.

b. Mini Project:

- i. Build a circuit using LEDs to test different logic gates.
- ii. Design a traffic light circuit using logic gates.
- iii. Implement a simple 2-bit binary addition circuit using logic gates.

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Specification Table (For ESE of Class room Instruction):

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	Passive and active elements				
II	Fundamentals of Electrical Circuits				
III	Semiconductor Materials and Diode Devices				
IV	Bipolar Junction Transistor (BJT) and Field Effect transistor (FET)				
V	Number Systems & Logic Gates				
Total					

Legend: R:Remember, U:Understand, A:Applyandabove

*Assessment rubric, process and product check list with ratings scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practicals. **Legend:** PRA: Process Assessment, PDA: Product Assessment

Note: Only one experiment has to perform at the end semester examination of Marks as per assessment scheme.

J) Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Industrial visits
6. Industrial Training
7. Field Trips
8. Portfolio Based Learning
9. Role Play
10. Demonstration
11. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Facebook, Mobile)
12. Brain storming
13. Others

K) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author	Publisher	Edition&Year
1	Fundamentals of Electrical and Electronics Engineering (English/Hindi)	Susan Mathew, Saji Chacko	AICTE, E-Kumbh	1 st Edition, 2021
2	Fundamental of Electric Circuits	Charles K. Alexander, Matthew N.O. Sadiku	McGraw-Hill Education	5 th edition ISBN:978-1259098598
3	A Text Book of Electrical Technology- Volume-1	B L Theraja	S Chand Publication	24 th Edition ISBN13:978-9355018267
4	Basic Electronics & Linear Circuits	Bhargava N.N.; Kulshreshtha D.C.; Gupta S. C.	Tata McGraw Hill; NewDelhi	2 nd Edition,2013, ISBN13:9789383286607
5	Linear Integrated circuits and Applications	Bakhshi U.A.; Godse A.P. and Bakshi A. V.	Technical Publications, Pune, India	2 nd Edition,January2011 ISBN-13:978-9350380055
6	Electronic Devices and Circuit Theory	Boylestead Robert; Neshelsky Louis	Pearson Education, NewDelhi	10 th Edition,2009 ISBN:978-8131727003
7	Electronics Principles	Malvino Albert;	McGraw Hill	ISBN:978-0070634244
8	Principle of electronics	Mehta V.K.; Mehta, Rohit	S.Chand and Company,Ram Nagar,NewDelhi-11055, 504	2014,ISBN:9788121924
9	मूल इलेक्ट्रिकल इंजीनियरिंग (Basic Electrical Engineering)	राहुल वाधवा	एशियन पब्लिशर्स	
10	मूल इलेक्ट्रॉनिक्स इंजीनियरिंग (Basic Electronics Engineering)	एस. के. जैन और अमित अग्रवाल	भारतीय टेक्निकल पब्लिकेशन	
11	मूल इलेक्ट्रॉनिक्स डिवाइसेस और सर्किट (Basic Electronics Devices and Circuit)	जयंत कुमार राय	यूनिवर्सिटी बुक हाउस, जयपुर	
12.	इलेक्ट्रॉनिक्स घटक और डिवाइस (Practical) Electronics Component & Devices (Practical)	राहुल वाधवा	एशियन पब्लिकेशन	
13.	इलेक्ट्रिकल वर्कशॉप गणना और विज्ञान (Practical) Electrical Workshop Calculation & Science (Practical)	एस. के. जैन और कपिल देव	कंप्यूटेक पब्लिकेशन लिमिटेड	

(b) Open source software and website address:

- i. <http://www.learnerstv.com/video/Free-video-Lecture-5079-Engineering.htm>
- ii. <https://www.allaboutcircuits.com/textbook/semiconductors/chpt-2/bipolar-junction-transistors>
- iii. <http://nptel.ac.in/courses/117103063/>
- iv. <https://www.youtube.com/watch?v=cITA0pONnMs>
- v. ClipperandClamper:-<https://www.youtube.com/watch?v=rkP3xmDF1oA>
- vi. Clamper:-<http://ee.eng.usm.my/eeacad/arjuna/Electronic%20device%20lecture4.pdf>

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Manufacturers' Manual
4. Users' Guide

L) Mapping of POs & PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiment and practice	PO-4 Engineering Tool	PO-5 The Engineer and Society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and team work	PO-9 Communication	PO-10 Life-long Learning	PSO-1	PSO-2
CO-1 Identify and select appropriate passive and active elements	2	1	2	2	1	1	3	2	1	3		
CO-2 Interpret Electric and Magnetic Circuit	2	1	2	2	1	1	3	2	1	3		
CO-3 Use semiconductor diode in various Electronics circuits.	2	2	3	3	1	1	3	3	3	3	2	2
CO-4 Test the working of Bipolar Junction Transistor(BJT) and FET.	3	3	3	3	2	2	3	3	3	3	2	2
CO-5 Use number systems and gates for various application.	3	3	3	2	1	1	2	3	2	3	2	2

Legend:1–Low,2 –Medium,3–High

M) Course Curriculum Map:

POs & PSOs No.	Cos No. &Titles	SOs No.	Classroom Instruction (CI)	Self Learning (SL)
PO-1,2,3,4,5, 6,7,8,9,10 PSO-1,2	CO-1I dentify and select appropriate passive and active elements	SO1.1 SO1.2 SO1.3 SO1.4 SO1.5	Unit1.0 Active and Passive Elements 1.0, 1.1,1.2, 1.3,1.4	As mentioned in relevant page numbers
PO-1,2,3,4,5, 6,7,8,9,10 PSO-1,2	CO-2 Interpret Electric and Magnetic circuits	SO2.1 SO2.2 SO2.3 SO2.4 SO2.5 SO2.6	Unit2.0 Fundamentals of Electric Circuit 2.1,2.2,2.3,2.4,2.5,2.6,2.7	
PO-1,2,3,4,5, 6,7,8,9,10 PSO-1,2	CO-3 Use semiconductor diode in various electronics circuits.	SO3.1 SO3.2 SO3.3 SO4.4	Unit3.0 Semiconductor Materials and Diode Devices 3.1 3.2 3.3	
PO-1,2,3,4,5, 6,7,8,9,10 PSO-1,2	CO-4 Test the working of Bipolar JunctionTransistor(BJT)andFET.	SO4.1 SO4.2 SO4.3 SO4.4	Unit4.0 Bipolar Junction Transistor (BJT) and Field effect transistor (FET) 4.1 4.2 4.3	
PO-1,2,3,4,5, 6,7,8,9,10 PSO-1,2	CO-5 Use Number system & logicgate to perform basic digital circuit operation.	SO5.1 SO5.2 SO5.3 SO5.4	Unit5.0 Number Systems & Logic Gates 5.1 5.2 5.3	

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI:Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning.



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-II

- A) Course Code : 2000B04AT014
B) Course Title : Applied Mathematics
C) Pre-requisite Course Code and Title:
D) Rationale :

This subject is introduced to those topics of mathematics, which are applied in different branches of engineering so that it can enhance required skills in mathematics underpinning engineering subjects. Integral calculus helps to find the area; differential equation is used in finding the curves and its related applications for various engineering models. Numerical integration is used to find the area of the functions especially whose integration cannot be evaluated easily with routine methods. This course further develops the skills to enable large engineering systems to be modeled.

E) **Course Outcomes:**

- CO-1 Solve the given problems of integration using suitable methods.
CO-2 Use the concept of integration to find area of given curves.
CO-3 Model the given engineering problems using the concept of differential equation.
CO-4 Utilize the concepts of numerical methods to solve given equations.
CO-5 Measure the area using the concept of numerical integration for engineering related problems.

F) **Scheme of Studies:**

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Total Credits(C) L+T+(P/2)
1	Applied Mathematics	2000B04AT014	Applied Mathematics	2	-	1	3

Legend: L: Classroom Instruction (Includes different instructional strategies i.e. Lecture and other), P: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies) T- Tutorial includes Sessional Work (SW) (includes assignment, seminar, mini project etc.) and Self Learning (SL), C: Credits

Note: SW and SL has to be planned and performed under the continuous guidance and feedback of teacher to ensure outcome of Learning.

G) Scheme of Assessment:

S. No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Applied Mathematics	2000B04AT014	Applied Mathematics	100	20	20	-	-	140

Note: i. Separate passing is must for TA component of Progressive Assessment, both for theory and practical.

i. Separate passing is must for End Semester Exam (Theory) and End Semester Exam (Practical).

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (L), Laboratory Instruction (P), T- Tutorial includes Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Solve the given problems of integration using suitable methods.

Session Outcomes (SOs)	Laboratory Instruction(P)	Classroom Instruction(L)	(Approx.Hrs:09) Self-Learning (SL)
SO1.1 Solve the given simple problem(s) based on rules of integration. SO1.2 Obtain the solution of given simple integral(s) using substitution method. SO1.3 Integrate given simple functions (integration by parts). SO1.4 Evaluate the given simple integral by using partial fractions.	--	Unit-1.0 Integral Calculus 1.1 Simple Integration: Rules of integration and integration of standard functions. 1.2 Methods of Integration: 1.21 Integration by substitution. 1.22 Integration by parts 1.23 Integration by partial fractions.	<ul style="list-style-type: none"> • Rules of integration • Methods of integration.

SW-1 Suggested Sessional Work (SW):

a. Assignments:

- i Expound examples of integration in day-to-day life.
- ii Enumerate the value of integrals for engineering related problems.

b. Mini Project:

- i Prepare charts displaying standard integration formulas.
- ii Identify problems based on application of integration.

c. Other Activities (Specify):

- i Identify engineering problems based on real world problems with the use of free tutorials available on the Internet.
- ii Use graphical software EXCEL, D-PLOT and GRAPH for related topics.
- iii Use MATHCAD as mathematical tool to solve the problems of integral calculus.
- iv Prepare a seminar on basic applications of integrals.

CO-2 Use the concept of integration of find area of given curves.

(Approx.Hrs:09)

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction (L)	Self-Learning(SL)
SO2.1 Solve given simple problems based on properties of definite integration. SO2.2 Apply the concept of definite integration to find the area under the given curve (s). SO2.3 Utilize the concept of definite integration to find area between given Two curves.		Unit-2.0 Applications of Integral Calculus 2.1 Definite Integration 2.11 Simple examples 2.12 Properties of definite integral (without proof) and simple examples. 2.2 Applications of integration 2.21 Area under the curve. 2.22 Area between two curves.	<ul style="list-style-type: none">• Standard formulas of simple integration• Properties of definite integrals. • Formulas for area between two curves

SW-2 Suggested Sessional Work (SW): Assignments:

- i. Enumerate the area of irregular shapes by using concept of integration.
- ii. Explore the use of definite integrals related to engineering applications.

b. Mini Project:

- i. Prepare charts showing area of irregular shapes using concept of integration.

c. Other Activities (Specify):

- i. Identify engineering problems based on real world problems with the use of free tutorials available on the Internet.
- ii. Use graphical software EXCEL, D-PLOT and GRAPH for topics related to Integral calculus.
- iii. Use MATHCAD as mathematical tool to solve the problems of integral calculus.
- iv. Seminar on engineering applications of definite integrals.

CO-3 Model the given engineering problems using the concept of differential equation.

(Approx. Hrs: 09)

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction (L)	Self-Learning (SL)
SO3.1 Find the order and degree of given differential equation (s).	--	Unit-3.0 Differential equations of first order and first degree	<ul style="list-style-type: none"> ● Terminologies of differential equations.
SO3.2 Form differential equation for given simple engineering problem.		3.1 Concept of differential equation	<ul style="list-style-type: none"> ● Formation, order and degree of differential equations.
SO3.3 Solve given differential equation using the variable separable method.		3.2 Order, degree and formation of differential equation.	
SO3.4 Obtain the solution of given Homogeneous Differential Equation.		3.3 Solution of differential equation	<ul style="list-style-type: none"> ● Methods of solution of differential equation
SO3.5 Solve the given linear differential equations.		3.31 Variable separable form.	
		3.32 Homogeneous Differential Equations	
		3.33 Linear differential equation.	

SW-3 Suggested Sessional Work (SW):

a. Assignments:

- i. Enumerate population growth using the concept of differential equations.
- ii. Use initial conditions to solve differential equations for engineering applications.

b. Mini Project:

- i. Prepare flow charts showing various methods for solving first order first-degree differential equations.
- ii. Prepare model showing the applications of differential equation for Newton's law

of cooling. iii Prepare models using the concept of differential equations for mixing problem.

c. Other Activities(Specify):

- i Identify engineering problems based on real world with the use of free tutorials available on the Internet.
- ii Use graphical software EXCEL, D-PLOT and GRAPH for applications of differential equations and related topics.
- iii Use MATHCAD as mathematical tool to solve the problems of engineering related to differential equations.
- iv Identify engineering problems related to differential equations.

CO-4 Utilize the concepts of numerical methods to solve given equations.

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction(L)	(Approx.Hrs:09) Self-Learning(SL)
SO4.1 Determine the roots of given equations using Bisection method. SO4.2 Calculate the roots of given equations using Regula Falsi method. SO4.3 Compute the roots of given equations using Newton-Raphson method.		Unit-4 Numerical Solutions of Equations Introduction of algebraic and transcendental equations 4.1 Bisection method 4.2 Regula Falsi method 4.3 Newton Raphson method	<ul style="list-style-type: none"> ● Roots of equations by Bisection Method ● Roots of equations using Regula Falsi Method ● Solution of equations using Newton-Raphson Method

SW-4 Suggested Sessional Work(SW):

a. Assignments:

- i. Write algorithm to find the approximate roots of algebraic equations.
- ii. Write algorithm to find the approximate roots of transcendental equations.

b. Mini Project:

- i. Prepare graph showing the roots of algebraic equation.
- ii. Prepare graph for finding the roots of equation by Regula falsi method.
- iii. Prepare graph for finding the roots of equation by Newton-Raphson method
- iv. Prepare a seminar on any relevant topic based on numerical method.
- v. Identify suitable numerical methods for engineering related problems.

c. Other Activities(Specify):

- i. Identify engineering problems based on real world problems with the use

of free tutorials available on the Internet.

- ii. Use graphical software EXCEL, D-PLOT and GRAPH for related topics.
- iii. Use MATHCAD as mathematical tool to solve the given equations by numerical methods

CO-5 Measure the area using the concept of numerical integration for civil engineering.

Session Outcomes (SOs)	Laboratory Instruction(P)	Classroom Instruction(L)	(Approx.Hrs:09) Self-Learning(SL)
SO5.1 Apply the concept of Numerical integration to find area from given data by Trapezoidal rule.		UNIT 5.0 Numerical Integration Introduction to Numerical integration	<ul style="list-style-type: none"> ● Integration by Trapezoidal rule.
SO5.2 Utilize the concept of Numerical integration to find area from given data by Simpson’s one third rule.		5.1 Trapezoidal rule 5.2 Simpson’s one third rule	<ul style="list-style-type: none"> ● Integration by Simpson’s one-third rule.
SO5.3 Use the concept of Numerical integration to find area from given data by Simpson’s three eighth rule.		5.3 Simpson’s three eighth rule	<ul style="list-style-type: none"> ● Integration by Simpson’s three eighth rule.

SW-5 Suggested Sessional Work(SW):

a. Assignments:

- i. Prepare chart showing the different formulas of numerical integration.
- ii. Compare the results obtained by Trapezoidal and Simpson’s rule for area related problems.
- iii. Explore the role of numerical integration in engineering related problems.

a. Mini Project:

- i Prepare a seminar on different methods of numerical integration.
- ii Prepare a model showing the civil engineering applications of numerical integration.

b. Other Activities(Specify):

- i Identify engineering problems based on real world problems with the use of free tutorials available on the Internet.
- ii Use graphical software EXCEL, D-PLOT and GRAPH for related topics.
- iii Seminar on applications of numerical integration.

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Specification Table (For ESE of Classroom Instruction):

Unit Number	Unit Title	Marks Distribution			Total Marks
		R	U	A	
I	Integral Calculus	2	6	12	20
II	Applications of Integral Calculus	2	6	12	20
III	Differential equations of first order and First degree	2	6	12	20
IV	Numerical Solutions of Equations	2	6	12	20
V	Numerical Integration	2	6	12	20
Total		10	30	60	100

Legend: R: Remember, U:Understand ,A: Apply and above

J) Suggested Specification Table (For ESE of Laboratory Instruction*):NA

Laboratory Instruction Number	Short Laboratory Experiment Title	Assessment of Laboratory Work(Marks)			
		Performance		Viva-Voce	
		PRA	PDA		
-	-	-	-	-	-

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practical ,

Legend: PRA: Process Assessment, PDA: Product Assessment

K) Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Industrial visits
6. Industrial Training
7. Field Trips
8. Portfolio Based Learning
9. Role Play
10. Demonstration
11. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
12. Brainstorming
13. Others

L) Suggested Learning Resources:**(a) Books:**

Sl. No.	Title	Author	Publisher	Edition & Year
1	अनुप्रयुक्त गणित द्वितीय	विकाश शिंदे	दीपक प्रकाशन	2015
2	Advanced Engineering Mathematics	Krezig, Ervin	Wiley Publ. New Delhi	2014, ISBN: 978-0-470-45836-5
3	Advanced Engineering Mathematics	H. K. Das	S. Chand & Co, New Delhi	ISBN: 9788121903455
4	Higher Engineering Mathematics	B. S. Grewal	Khanna Publ. New Delhi	2015, ISBN :8174091955
5	Engineering Mathematics, Volume 1	S. S. Sastry	PHI Learning, New Delhi	2009, ISBN: 978-81-203-3616-2
6	A text book of Engineering Mathematics	Dutta, D	New age International publications, New Delhi	2006 ISBN: 978-81-24-1689-3
7	Getting Started with MATLAB-7	Pratap, Rudra	Oxford University Press, New Delhi,	2009 ISBN: 0199731241

(b)**Open source software and website address:**

- 1 www.scilab.org/ -SCI Lab
- 2-www.dplot.com/ -DPlot
- 3 www.allmathcad.com/ -MathCAD
- 4 www.wolfram.com/mathematica/ - MATHEMATICA
- a. www.easycalculation.com

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Manufacturers' Manual
4. Users' Guide

M) List of Major Laboratory Equipment and Tools: NA

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number

L) Mapping of POs & PSOs with COs:

Course Outcomes(COs)	Programme Outcomes(POs)										Programme Specific Outcomes (PSOs)	
	Basic knowledge PO-1	Discipline knowledge PO-2	Experiments & Practice PO-3	Engineering Tools PO-4	The Engineer & Society PO-5	Environment & Sustainability PO-6	Ethics PO- 7	Individual & Team work PO-8	Communication PO-9	Life Long learning PO-10	PSO-1	PSO-2
CO-1	√	√	√	-	-	-	-	√	√	√		
CO-2	√	√	√	-	-	-	-	√	√	√		
CO-3	√	√	√	-	-	-	-	√	√	√		
CO-4	√	√	√	-	-	-	-	√	√	√		
CO-5	√	√	√	-	-	-	-	√	√	√		

M) Course Curriculum Map:

POs & PSOs No.	Cos No. & Title.	SOs No.	Laboratory Instruction (P)	Classroom Instruction(L)	Self-Learning(SL)
PO-1, 2,3,8,9,10 PSO---	CO-1 Solve the given problems of integration using suitable methods.	SO1.1 SO1.2 SO1.3 SO1.4		Unit-1.0IntegralCalculus 1.1,1.2	1.1(a),1.2(a)
PO-1, 2,3,8,9,10 PSO---	CO-2Usetheconceptofintegration to find area of given curves.	SO2.1 SO2.2 SO2.3 SO2.4		Unit-2.0ApplicationsofIntegralCalculus 2.1,2.2	2.1(a), 2.1(b). 2.2(a)
PO-1, 2,3,8,9,10 PSO---	CO-3Modelthegivenengineering Problems using the concept of differential equation.	SO3.1 SO3.2 SO3.3 SO3.4 SO3.5		Unit-3.0Differenialequationsoffirstorder and first degree 3.1,3.2,3.3	3.1(a), 3.2(a), 3.3(a)
PO-1, 2,3,8,9,10 PSO---	CO-4 Utilize the concepts of Numerical methods to solve given equations.	SO4.1 SO4.2 SO4.3		Unit-4.0NumericalSolutionsofEquations 4.1,4.2, 4.3	4.1(a), 4.2(a), 4.3(a)
PO-1, 2,3,8,9,10 PSO---	CO-5Measuretheareausingthe Concept of numerical integration for civil engineering	SO5.1 SO5.2 SO5.3		Unit-5.0NumericalIntegration 5.1,5.2,5.3	5.1(a), 5.2(a), 5.3(a)



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-II

- A) **Course Code** : 2000B05CT020
 B) **Course Title** : Environmental Engineering and Sustainable Development

C) **Pre- requisite Course Code and Title :**

D) **Rationale:** The world has changed drastically during the last half century, both technologically, economically and socially. In present time, solid waste, e-waste, air pollution, water and land pollution and conservation of natural resources wants more attention. The growth of multinational businesses, the depletion of national and natural resources, and the tremendous advances in technology in many countries raised concerns over issues of Environment climate Change and Sustainable Development. We are also witnessing the emergence of Green and Clean Technology for Sustainable Development. In this context, the understanding about environment issues and challenges is very essential for engineers as it guide for sustainable development.

The knowledge and application of such aspects is essential in developing a good technician who should be conversant with the core concepts, principles and practices of environment pollution problems and sustainable development (SD).

This course is designed to serve as foundation knowledge for diploma studies in Engineering. It will introduce the concept of environmental issues, problems due to pollution and social & economical dimensions including disaster management for SD. The future engineers must use 3R concept by focusing on changing patterns of Engineering Design, Production, Consumption, and use of natural and non-conventional energy resources optimally and judiciously by enforcing laws and legislatives during any engineering projects.

E) **Course Outcomes :**

CO-1 Describe causes, prevention and remedial measures of water and air pollution.

CO-2 Explain causes, prevention and remedial measures of Soil, Noise, Thermal and Nuclear pollution.

CO-3 Create awareness about sustainable development and clean technology.

CO-4 Perform Environmental Impact Assessment (EIA) for new design and project

CO-5 Create awareness for social issues and the environment.

F) **Scheme of Studies:**

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Total Credits(C) L+T+(P/2)
1	Civil Engineering	2000B05CT020	Environmental Engineering and Sustainable Development	2	-	-	2

Legend:L: Classroom Instruction (Includes different instructional strategies i.e. Lecture and other),
P: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies) T- Tutorial includes Sessional Work(SW) (includes assignment, seminar, mini project etc.) and Self Learning (SL), C: Credits

Note: SW and SL has to be planned and performed under the continuous guidance and feedback of teacher to ensure outcome of Learning.

G) Scheme of Assessment:

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Civil Engineering	2000B05CT020	Environmental Engineering and Sustainable Development	100	20	20	-	-	140

Note: i. Separate passing is must for TA component of Progressive Assessment, both for theory and practical.

ii. Separate passing is must for End Semester Exam(Theory) and End Semester Exam(Practical).

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (L), Laboratory Instruction (P), T-Tutorial includes Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Describe causes, prevention and remedial measures of water and air pollution.

(Approx. Hrs: L+P+T = 05)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
<p>SO1.1 Develop awareness for Global Environmental problems.</p> <p>SO1.2 Explain causes of water pollution and describe its prevention and remedial measures.</p> <p>SO1.3 Explain causes of air pollution and describe its prevention and remedial measures.</p>	<p>--</p>	<p>UNIT-1 Water pollution and Air pollution</p> <p>1.0 Introduction to environment and environment pollution</p> <p>1.1 Water pollution</p> <p>1.1.1 Introduction</p> <p>1.1.2 sources of water pollution</p> <p>1.1.3 classification of water pollutants</p> <p>1.1.4 adverse effect of water pollution</p> <p>1.1.5 control of water pollution</p> <p>1.1.6 Physical and chemical standard of domestic water as per Indian standard.</p> <p>1.2 Air pollution</p> <p>1.2.1 Introduction</p> <p>1.2.2 Sources of air Pollutants</p> <p>1.2.3 classification of air Pollutants</p> <p>1.2.4 Effect of air pollution on human plant, animal.</p> <p>1.2.5 Air monitoring system</p> <p>1.2.6 Air pollution control</p>	<ul style="list-style-type: none"> ● Study of health hazards of water pollution. ● Explain with help of diagram the working of pollution control devices <ul style="list-style-type: none"> a. Cyclone separators b. Electro static precipitators.

SW-1 Suggested Sessional Work (SW) :

a. Assignments:

- i. Describe in a tabular format the various causes of air and water pollution.
- ii. Make a chart for physical and chemical standard of domestic water as per Indian standard.

b. Mini Project:

- i. Collect information about water and air quality in the vicinity from local bodies and discuss the findings.

CO- 2 Explain causes, prevention and remedial measures of Soil, Noise, Thermal and Nuclear pollution.

(Approx. Hrs: L+P+T = 05)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
<p>SO2.1 Recognise causes of Soil pollution.</p> <p>SO 2.2 Explain causes of Noise pollution.</p> <p>SO 2.3 Recognise the Thermal as pollutant.</p> <p>SO 2.4 Describe radiation and its pollution effects.</p>		<p>UNIT-2 Soil, Noise , Thermal and Nuclear pollution</p> <p>2.1 Soil pollution</p> <p>2.1.1 introduction</p> <p>2.1.2 sources of soil pollution</p> <p>2.1.3 adverse effect of soil pollution</p> <p>2.1.4 control measures of soil pollution</p> <p>2.2 Noise pollution</p> <p>2.2.1 Introduction</p> <p>2.2.2 Measurement of noise and acceptable noise level</p> <p>2.2.3 sources of noise pollution</p> <p>2.2.4 effect of noise pollution</p> <p>2.2.5 control of noise pollution</p> <p>2.3 thermal pollution</p> <p>2.3.1 introduction</p> <p>2.3.2 effects of thermal pollution</p> <p>2.3.3 causes</p> <p>2.3.4 control</p> <p>2.4 Radio active pollution</p> <p>2.4.1 introduction</p> <p>2.4.2 sources of radio active pollution</p> <p>2.4.3 Adverse effects of radioactive pollution</p> <p>2.4.4 control of radio active pollution</p>	<ul style="list-style-type: none"> Identify the modern equipments and methods for measurement of Soil, Noise and Thermal pollution.

SW-2 Suggested Sessional Work (SW):

a. Assignments:

- i. Write short notes on sources and effects of
 - a. Soil Pollution
 - b. Noise Pollution
 - c. Thermal Pollution
 - d. Radio active Pollution

b. Mini Project:

- i. Collect informations from local bodies for their efforts and findings regarding soil pollution in vicinity.

CO-3 Create awareness about sustainable development and clean technology.

(Approx. Hrs: L+P+T = 05)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
<p>SO3.1 Recognize the concept of sustainable development.</p> <p>SO3.2 Appreciate the importance of management, consumption & conservation of natural resources.</p> <p>SO3.3 Explain clean technology.</p> <p>SO 3.4 Recognize the importance of waste minimization.</p> <p>SO3.5 Appreciate importance of solar power, hydel, wind power and biomass energy.</p>		<p>Unit 3. Sustainable Development and Clean technologies</p> <p>3.1 Sustainable Development</p> <p>3.1.1 Concept of sustainable development</p> <p>3.1.2 Natural resources, a-biotic and biotic resources</p> <p>3.1.3 Principles of conservation of energy and management</p> <p>3.1.4 Need of Renewable energy</p> <p>3.1.5 Growth of renewable energy in India and the world</p> <p>3.1.6 Concept of waste management and recycling</p> <p>3.2 Clean Technologies</p> <p>3.2.1 Introduction: Clean technology</p> <p>3.2.2 Types of Energy</p> <p>3.2.3 Conventional Energy Sources</p> <p>3.2.4 Non-conventional Sources of Energy</p> <p>3.2.5 Recycling pollution control</p> <p>3.3 Solar Power</p> <p>3.3.1 Features of solar thermal and PV systems</p> <p>3.3.2 Types of solar cookers and solar water heaters</p> <p>3.4 Hydel Energy and its advantages</p> <p>3.5 Wind energy –advantages and limitations</p> <p>3.6 Biomass energy</p> <p>3.6.1 Types of Biomass Energy Sources</p> <p>3.6.2 Energy content in biomass of different types</p> <p>3.6.3 Types of Biomass conversion processes</p> <p>3.6.4 Biogas production</p>	<ul style="list-style-type: none"> Utilization of bio-fuels and electricity in transportation sector.

SW-3 Suggested Sessional Work (SW):**a. Assignments:**

1. Explain concept of sustainable development.
2. Describe conventional and non conventional energy sources with suitable example.

b. Mini Project:

1. Prepare a report on energy scenario in India context.

CO-4 Perform Environmental Impact Assessment (EIA) for new design and project**(Approx. L+P+T = 05)**

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO4.1 Carry out EIA for a new engineering product /projects. SO4.2 Develop Post EIA report. SO4.3 Implement EIA findings ensuring Sustainable development		Unit 4.0 Envi. Impact Assessment (EIA) 4.1 Public Participation inEIA 4.1.1 EIA documentation 4.1.2 Case studies on EIA 4.1.3 EIA scope &steps 4.2 EIA process 4.2.1 EIA report 4.2.2 EIA Gazette notification 4.2.3 EIA action plan 4.3 EIA implementation 4.3.1 EIA directives 4.3.2 follow-ups	<ul style="list-style-type: none"> ● Study the reports of EIA of a construction project

SW-4 Suggested Sessional Work (SW):**a. Assignments:**

- i. Prepare EIA for Roads construction
- ii. Prepare sugar industry EIA advertisement for a daily newspapers

b. Other Activities (Specify):

- i. Mock drill for EIA session

CO- 5 Create awareness for social issues and the environment.

(Approx. Hrs: L+P+T = 05)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO5.1 Appreciate conservation of water. SO5.2 Explain acid rain, green house effect, depletion of ozon layer, global warning. SO5.3 Understand solid waste management.		Unit 5.0 Social Issues And The Environment 5.1 Water conservation 5.2 Rain water harvesting 5.3 Watershed management 5.4 Acid rain and its effect 5.5 Climate change 5.6 Green house effect 5.7 Depletion of Ozonlayer and effect of Ozon layer depletion 5.8 Global warming and measures against global worming 5.9 Solid waste management: causes, effects and control measures of urban and industrial waste, importance of 3R's in waste management. 5.10 Environment protection Act1986: importance and objective	<ul style="list-style-type: none"> Study rain water harvesting system in a building.

SW-5 Suggested Sessional Work (SW) :

a. Assignments:

- i. Explain conservation of water.
- ii. Write notes on current global environment issues.

b. Mini Project:

- i. Discuss the case study of Bhopal gas leak disaster.
- ii. Discuss the method of solid waste management adopted by local authority in the vicinity.

Note: Performance under Laboratory and Sessional work may appear in more than one Cos/Sos.

I) Suggested Specification Table (For ESE of Classroom Instruction):

Unit Number	Unit Title	Marks Distribution			Total Marks
		R	U	A	
I	Water pollution and Air pollution	5	10	5	20
II	Soil, Noise , Thermal and Nuclear pollution	5	10	5	20
III	Sustainable Development and Clean technologies	5	10	5	20
IV	Environmental Impact Assessment (EIA)	5	10	5	20
V	Social issues and the environment	5	10	5	20
Total		25	50	25	100

Legend: R: Remember, U: Understand, A: Apply and above

J) Suggested Specification Table (For ESE of Laboratory Instruction*):NA

Laboratory Instruction Number	Short Laboratory Experiment Title	Assessment of Laboratory Work (Marks)		
		Performance		Viva-Voce
		PRA	PDA	
-	-	-	-	-

* Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practicals

Legend: PRA: Process Assessment, PDA : Product Assessment

K) Suggested Instructional/Implementation Strategies:

- 1) Improved Lecture
- 2) Case Method
- 3) Group Discussion
- 4) Industrial visits
- 5) Field Trips
- 6) Demonstration
- 7) ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)

L) Suggested Learning Resources:

(a) **Books :**

S. No.	Title	Author	Publisher	Edition & Year
1	Environmental studies	Dr. Suresh K. Dhameja	S K kataria and sons	2012
2	Energy, Environment Ecology & Society	Dr. Surinder Deswal	Dhanpat Rai & sons	2014
3	Environment & Ecology	Dr. Plyush Kant Pandey	Sun India Publication	2009
4	Energy and sustainable development	P S Ramakrishnan	National Book Trust	2014
5	Our Environment (Hindi Textbook)	M k Goyal	Agrawal publications Agra	2013
6	पर्यावरण अभियांत्रिकी Environment Engineering Hindi	अजय कुमार उपाध्याय	दीपक पब्लिकेशन	
7	पर्यावरण अभियांत्रिकी तथा सुरक्षा	के. के. गुप्ता	दीपक पब्लिकेशन	
8	उर्जा और गैर परम्परागत स्रोत	वी. के. जैन	दीपक प्रकाशन, ग्वालियर	
9	नवीनीकरण उर्जा प्रौद्योगिकी	विमल कुमार	दीपक प्रकाशन, ग्वालियर	
10	पर्यावरण अभियांत्रिकी एवं सतत विकास	संजय सक्सेना	दीपक प्रकाशन, ग्वालियर	
11	सामान्य जागरूकता एवं पर्यावरण	आलोक यादव	दीपक प्रकाशन, ग्वालियर	
12	पर्यावरण अभियांत्रिकी	जयकुमार उपाध्याय	दीपक प्रकाशन, ग्वालियर	

(b) Open source software and website address:

1. www.nptel.ac.in
2. <https://swayam.gov.in>

M) List of Major Laboratory Equipment and Tools:NA

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
-	-	-	-

N) Mapping of POs & PSOs with COs:

Course Outcomes (COs) Titles	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	Basic knowledge PO-1	Discipline knowledge PO-2	Experiments & Practice PO-3	Engineering Tools PO-4	The Engineer & Society PO-5	Environment & Sustainability PO-6	Ethics PO-7	Individual & Team work PO-8	Communication PO-9	Life Long learning PO-10	PSO-1	PSO-2
CO-1 Describe causes, prevention and remedial measures of water and air pollution.	1	1	1	1	3	3	3	3	1	3	1	1
CO-2 Explain causes, prevention and remedial measures of Soil, Noise, Thermal and Nuclear pollution.	1	1	1	1	3	3	3	3	1	3	1	1
CO-3 Create awareness about sustainable development and cleantechology	1	1	1	1	3	3	3	3	1	3	1	1
CO-4 Perform Environmental Impact Assessment (EIA) for new design and project	1	1	1	1	3	3	3	3	1	3	1	1
CO-5 Create awareness for social issues and the environment.	1	1	1	1	3	3	3	3	1	3	1	1

O) Course CurriculumMap:

POs & PSOs No.	COs No. & Title	SOs No.	Laboratory Instruction (P)	Classroom Instruction (L)	Self Learning (SL)
PO- 1 to 10 PSO-1,2	CO-1 Describe causes, prevention and remedial measures of water and air pollution.	SO1.1 SO1.2 SO1.3	--	UNIT-1 Water pollution and Air pollution 1.0 1.1 : 1.1.1 –1.1.6 1.2 : 1.2.1 –1.2.6	As mentioned in relevant pages.
PO- 1 to 10 PSO-1,2	CO-2 Explain causes, prevention and remedial measures of Soil, Noise, Thermal and Nuclear pollution.	SO 2.1 SO 2.2 SO 2.3 SO 2.4	--	Unit 2.0 Soil, Noise , Thermal and Nuclear pollution 2.1: 2.1.1- 2.1.4 2.2 : 2.2.1 -2.2.5 2.3 : 2.3.1 -2.3.4 2.4 : 2.4.1 - 2.4.4	
PO- 1 to 10 PSO-1,2	CO-3 Create awareness about sustainable development and clean Technology	SO.3.1 SO3.2 SO3.3 SO3.4 SO3.5	--	Unit 3.0 Sustainable Development and Clean Technologies 3.1:3.1.1 - 3.1.6 3.2 : 3.2.1 -3.2.5 3.3 : 3.3.1,3.3.2 3.4 3.5 3.6 : 3.6.1 – 3.6.4	
PO- 1 to 10 PSO-1,2	CO4- Perform Environmental Impact Assessment (EIA) for new design and project	SO4.1 SO4. SO4.3	--	Unit4.0Envi.ImpactAssessment(E IA) 4.1 : 4.1.1 -4.1.3 4.2 : 4.2.1 -4.2.3 4.3 : 4.3.1,4.3.2	
PO- 1 to 10 PSO-1,2	CO-5 Create awareness for social issues and the environment.	SO5.1 SO5.2 SO5.3	--	Unit 5.0 Social Issues And The Environment 5.1 – 5.10	



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)
Diploma (Common to All Branches)
Semester-II

- A) **Course Code** : 2000B01DL046
 B) **Course Title** : Professional Communication & Language (Lab)
 C) **Pre- requisite Course Code and Title** :
 D) **Rationale** :

Professional Communication Skills are core skills to be developed in diploma graduates as students exchange information and convey their ideas and opinions with different stakeholders. Students in technical institutes need to be trained for this. The focus of the course is to develop a wide variety of soft skills starting from communication, to work in different environments developing emotional sensitivity, learning creative and critical decision making, developing awareness of how to work with and negotiate with people. The key areas addressed are conversation skills, group skills, leadership & persuasion skills, presentation skills, personal grooming, and positive thinking with ethical values.

E) Course Outcomes:

- CO-1 Exhibit Impressive Personality and Presentation Skills in a Professional Environment.**
CO-2 Explore and Use Different Soft Skills in Professional Interactions.
CO-3 Demonstrate Effective Listening and Reading Skills.
CO-4 Draft Applications and Business Letters, Notices and Emails.

F) Scheme of Studies:

Teaching Hours: 60

S.N.	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)				
				CL	TL	PL	Assesment Hrs	Total Credit L+T(P/2)
1.	Humanities	2000B01DL046	Professional Communication and Language Lab	-	-	4	10	2

Legend: CL-Lecture, PL-Practical, TL-Tutorial, SLA - Self Learning Assessment

Legend: CL: Classroom Instruction (Includes different instructional strategies i.e. Lecture and others), PL: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies) TL- Tutorial includes Sessional Work(SW) (includes assignment, seminar, mini project etc.) and Self Learning (SL), C: Credits

Note: SW and SL has to be planned and performed under the continuous guidance and feedback of a teacher to ensure the outcome of Learning.

G) Scheme of Assessment:

S. No	Board of Study	Course Code	Course Title	Scheme of Examination							
				Theory			Practical			SL	Total Marks
				ESE	CT	TA	ESE	PA	TA	SLA	
1	Humanities	2000B01D L046	Professional Communication and Language Lab	-	-	-	40		20	-	60

Legend:ESE: End Semester Exam, CT: Class Test, TA: Teacher Assessment, PA: Practical Assessment, SLA: Self-Learning Assessment

H) Course-Curriculum Detailing:

This curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CL), Laboratory Instruction (PL), TL-Tutorial includes Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Exhibit Impressive Personality and Presentation Skills in a Professional Environment.

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self Learning (SL)
SO-1.1 Understand and Practice Positive Traits for an Impressive Personality. SO-1.2 Introduce Himself in a Professional Set Up SO-1.3 Demonstrate Presentation Skills using Effective Techniques	Unit 1: Personality & Presentation Skills Hours: 15 1.1 Understanding Personality and Personality Types 1.2 Essentials of an Impressive Personality <ul style="list-style-type: none"> ● Body Language and Confidence ● Dress Code ● Good Health ● Use of Cosmetics ● Sense of Humor ● Good Communication Skills ● Human Values ● Knowledge, Skills and Positive Attitude 1.3 Presentation skills 1.3.1 Characteristics of Effective Presentation <ul style="list-style-type: none"> ● Audience Focused ● Clear Objectives ● Well - Structured 	Watching Videos, Lectures, Interviews of eminent and impressive persons and learning presentation skills and techniques

	<ul style="list-style-type: none"> ● Audio- Visual Aids ● Body Language and Confidence ● Engaging ● Passionate, Reliable, Interesting ● Time Management ● Feedback 	
--	--	--

SW1- Suggested Sessional Work (SW):

a. Assignments:

Write a short paragraph about your personality.

b. Mini Project:

Prepare a 2-3 minute presentation on topics like- My strength and Weakness, My Role Model, My Dream Job, What Makes A Good Personality etc.

c. Other Activities (Specify):

Presentation Practice on different topics

CO-2 Explore and Use Different Soft Skills in Professional Interactions.

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self Learning (SL)
SO-2.1 Understanding Leadership & Team work	<p>Unit 2: Soft Skills Hours: 15 2.1 Importance of Leadership and Team Work 2.2 Different Leadership Styles Autocratic, Democratic, Ethical, Transformational etc. 2.3 Qualities of a Good Leader:</p> <ul style="list-style-type: none"> ● Effective Communication, Clear Objectives, Decision Making, Determination, Foresight, Financial Management & Control, Selection of a Team and Work Distribution, Motivation, Patience, Confidence, Persuasive Skills, Critical Thinking, Accountability, Empathy, Awareness & Exploration etc. <p>2.5 Objectives of a Group Discussion 2.6 Dos and Don'ts in a Group Discussion 2.7 Time Management</p> <ul style="list-style-type: none"> ● Prioritize, Set Goals & Tools, Plan, Schedule, Avoid Procrastination, Minimize Distractions, Continuous Review etc. 	Study of Learning Material available on Internet, Reference Books and Other Sources

SW2- Suggested Sessional Work (SW):

- a. **Assignment:**
Listing the Qualities of an Ideal Leader
- b. **Mini Project:**
Recorded study material on Leadership and Team Work may be played in the class and students may be asked to listen and answer.
- c. **Other Activities (Specify):**
Exhibit Leadership Skills in an Assigned Work

CO-3 Demonstrate Effective Listening and Reading Skills.

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self Learning (SL)
SO3.1- Communicate Effectively using Correct Pronunciation, Modulation, Pitch etc., SO3.2 - Develop Active Listening Competencies SO3.3 - Develop LSRW Skills	Unit 3: Listening & Reading Practice Hours: 15 3.1 Need of Learning to learn skills (Listening, Reading and Speaking) 3.2 Practice Loud reading 3.3 Practice Active Listening 3.4 Practice Speaking in Class (Group Discussion, Extempore, Debate, Role Play etc.)	<ol style="list-style-type: none">1. Reading Articles from Newspaper Magazines and Passages from Books2. Watching TV News Bulletins and Programs to Improve Listening

SW3- Suggested Sessional Work (SW):

- a. **Assignments:**
Preparing Skits to Show Creativity, Communication and Critical Thinking
- b. **Mini Project:**
Recorded Lectures may be played in the class and students are asked to listen and answer.
- c. **Other Activities (Specify):**
Self Introduction, Speech and Spell Test, Movie Clips, Games, Stories, Questionnaire, Role Play, Exercises, Task, Video/Audio Watching etc.

CO-4 Draft Applications and Business Letters, Notices and Emails.

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self Learning (SL)
SO4.1 Draft Job Application and Resume SO4.2 Draft Application for Promotion and Other Applications for Different Purposes SO4.3 Draft Different Kinds of Business Letters SO 4.4 Draft Notices & Emails	Unit 4: Applications and Business Letters Hours: 15 4.1 Applications 4.1.1 Job Applications with Resume/CV 4.1.2 Application for Promotion 4.1.3 Applications for Different Purposes 4.2 Business Letters 4.2.1 Quotations and Replies 4.2.2 Business Orders 4.2.3 Complaint Letters 4.2.4 Notices 4.2.5 E-mail Etiquette	1. Read sample letters and applications, 2. Practice on different formats of letters, applications and notices.

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW4: Suggested Sessional Work (SW) :

a. Assignments:

- I. Write an application to apply for a Campus Recruitment Drive to be held in your college.
- II. Draft different types of business letters (e.g. for a document, for a service etc.)
- III. Prepare a notice for your class/department as per given instructions.

b. Mini Project:

- I. Prepare your Resume and Cover Letter for a Job Vacancy.
- II. Draft notices for sports activities/ lost belongings/ competitions/celebrations.

c. Other Activities (Specify):

Exchange opinion on the contents to be included/excluded in the topics mentioned in the Classroom Instruction Section.

I) Suggested Specification Table (For ESE of Lab Instruction):

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	Personality & Presentation	1	3	6	10
II	Soft Skills	2	3	5	10
III	Listening & Reading Practice	3	2	5	10
iv	Applications & Business Letters, Notices, Emails	2	2	6	10
Total		08	10	22	40

Legend: R: Remember, U: Understand, A: Apply and above

J) Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Role Play
6. Demonstration
7. ICT Based Teaching Learning (Video Demonstration/Tutorials CBT, Blog, , Whatsapp, Mobile, Online sources)
8. Brainstorming

K) Suggested Learning Resources:

(a) Books :

1. **Communication Skills for Technical Students, Book I;** Somaiya Publications, Bhopal
2. **A Course in Technical English, Book II;** Somaiya Publications, Bhopal
3. Gopaldaswamy Ramesh & Mahadevan Ramesh; **The Ace of Soft Skills**, Pearson
4. Kavita Tyagi & Padma Mishra; **Basic Technical Communication**, PHI
5. R P Sinha; **How to write Correct English**, Bharati Bhawan, Patna
6. Anjana Tiwari; **Communication Skills in English**, Khanna Book Publishing Co. (P) Ltd
7. K K Sinha; **Business Communication**, Galgotiya Publishing Company, New Delhi
8. M Ashraf Rizvi; **Effective Communication Skills**, Tata-McGrawHill Publications
9. Kulbhushan Kumar, **English for Technical Professionals**; Khanna Book Publishing Co. (P) Ltd
10. Dr. Sumi Guha & Dr. Shameena Bano **A Study Guide on Communication Skills for Technical Students**, Vaibhav Prakashan.

(b) Reference Books/Sources in Hindi:

1. रोजगार कौशल: छात्र कार्य पुस्तिका, भाग 1 एवं भाग 2; राष्ट्रीय कौशल विकास निगम (NSDC)
<https://bharatskills.gov.in>

(c) MOOCs Courses Links:

1. <https://nptel.ac.in>
2. <https://swayam.gov.in>
3. <https://coursera.org>

(d) Open source software and website address:

1. <https://www.englishgrammar.org/>
2. <http://www.englishgrammarsecrets.com/>
3. <https://www.usingenglish.com/handouts/>
4. <http://learnenglish.britishcouncil.org/en/english-grammar>
5. <https://www.englishclub.com/grammar/>
6. <http://www.perfect-english-grammar.com/>
7. <http://www.englishteachermelanie.com/category/grammar/>
8. <https://www.grammarly.com/blog/category/handbook>
9. <http://learnenglish.britishcouncil.org/en/content>
10. <http://www.talkenglish.com/>
11. <https://www.languagelabssystem.com>
12. www.wordsworthelt.com

(d) Others:

Learning Packages.

1. Lab Manuals.
2. Language software Manual
3. Users' Guide

L) List of Major Laboratory Equipment and Tools:

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1	Computers	A complete computer system with headphones & Speakers	All
2	Software	English communication softwares –ETNL, Biyani, Globalina, A-One Solutions, Wordsworth, Spears	All
3.	Computer tables & chairs	Depending upon the size of the Language Lab	All
4.	Smart Board	Depending upon the size of the Language Lab	All
5.	Projector	Depending upon the size of the Language Lab	All

M) Mapping of POs & PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiments and practice	PO-4 Engineering Tools	PO-5 The engineer and society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and teamwork	PO-9 Communication	PO-10 Life-long learning	PSO-1	PSO-2
CO1	3	2	2	1	3	1	2	3	3	3		
CO2	3	2	2	1	3	1	2	3	3	3		
CO3	3	2	1	1	2	1	1	2	3	3		
CO4	3	2	1	1	2	1	1	2	3	3		

Legend:1 – Low, 2 – Medium, 3 – High

N) Course Curriculum Map:

POs	COs No.& Titles	Laboratory Instruction(P)	Self Learning (SL)
PO1,2,3,4,5,6,7,8,9,10	CO-1 Exhibit Impressive Personality and Presentation Skills in a Professional Environment	1.1 1.2 1.3	As mentioned in relevant page number
PO1,2,3,4,5,6,7,8,9,10	CO-2 Explore and Use Different Soft Skills in Professional Interactions	2.1 2.2 2.3 2.3 2.4 2.5 2.6 2.7	
PO1,2,3,4,5,6,7,8,9,10	CO-3 Demonstrate Effective Listening and Reading Skills.	3.1 3.2 3.3 3.4	
PO1,2,3,4,5,6,7,8,9,10	CO-4 Draft Applications and Business Letters, Notices and Emails.	4.1 4.2 4.3 4.4 4.5	



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-II

- A) **Course Code** : 2000B02CL028
 B) **Course Title** : Electrical and Electronics Workshop
 C) **Pre-requisite Course Code and Title** :
 D) **Rationale:**

Electrical, Electronics & Telecommunication, Instrumentation, Computer Science, Information Technology and allied engineering diploma holders are expected to handle various, general purpose tools and test and measuring equipment in the electrical and electronics workshop. They have to supervise work related to maintain the low voltage electric supply of the shop floor, assembly of units and soldering of electronic components and circuits in the workshop. The course will develop skills to handle general purpose tools, equipment used in the electrical and electronics workshop and perform soldering and basic testing activities.

E) **Course Outcomes:**

- CO-1 Use fire fighting equipment and other safety related accessories.
 CO-2 Test general purpose electrical components (Resistor, Capacitor, Inductor and Transformer) using Multimeter.
 CO-3 Test general purpose electronic components using Measuring instruments.
 CO-4 Test and maintain a given domestic Electrical load.
 CO-5 Perform soldering and disordering of discrete component on a general purpose PCB.

1. **Scheme of Studies:**

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Total Credits(C) L+T+(P/2)
1	Electronics and Telecommunication Engineering	2000B02CL028	Electrical & Electronic Workshop	-	2	-	1

Legend: L- Lecture, P-Practical, T-Tutorial

2. **Scheme of Assessment:**

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Electronics and Telecommunication Engineering	2000B02CL028	Electrical & Electronic Workshop	-	-	-	40	20	60

Legend:ESE-Endsemester Examination,CT-Classtest,TA-Teachers'Assessment

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at the course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Use fire fighting equipment and other safety related accessories.

(05 Hrs)

Session Outcomes (SOs)	Laboratory Instruction (LI)
SO1.1 Identify and select the appropriate fire extinguisher for different types of fires (Class A, B, C, D, and K).	LE1.1 Conduct mock artificial respiration and first Aid exercise to learn about safety procedures of first Aid in case of electrical/electronic hazards.
SO1.2 Demonstrate the correct procedure to use firefighting equipment	LE1.2 Use Fire extinguisher to extinguish the fire in a given situation.
SO1.3 List and explain the use of first-aid items for electrical/electronic hazards	LE1.3 Prepare a checklist of safety equipment and first-aid items required in an electronics workshop.
SO1.4 Describe the ways to maintain good housekeeping in the given situation.	

Legend: CI: Classroom Instruction (Includes different instructional strategies, i.e. Lecture (L) and Tutorial (T) and others), LI : Laboratory Instruction (Includes Practical performances in the Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-1 Suggested Sessional Work(SW):

- **Assignments:**
 - i. Prepare a report on the types of firefighting techniques.
 - ii. Prepare safety symbols chart.
- **Mini Project:**
 - i. Visit to an Organization /field and Submit a report on safety practices followed in the Organization /field.
- **Other Activities (Specify):**
 - ii. Show video on mock drill for firefighting.
 - iii. Show standard security charts used in workshops.

CO-2 Test general purpose electrical components (Resistor, capacitor, inductor and transformer) using Multimeter. (05 Hrs)

Session Outcomes(SOs)	Laboratory Instruction (LI)
SO2.1 Describe the steps to measure AC and DC voltage and current using multimeter. SO2.2 Explain the importance of Continuity testing in the faultfinding. SO 2.3 Describe the steps to measure the power of a given load using voltmeter and ammeter. SO2.4 Compare various types of resistors. SO2.5 Identify type of capacitor in the given circuit. SO2.6 Identify type of inductor in the given circuit.	LE2.1 Use a multimeter to measure AC and DC voltages. LE2.2 Measure output voltages of the given batteries. LE2.3 Test continuity of the given circuit with the help of multimeter. LE 2.4 Measure the power of any load using voltmeter and ammeter. LE2.5 Measure resistance of the given resistor from color code and verify it using Multimeter. LE2.6 Measure capacitance of the given capacitor (mica, ceramic, paper, electrolytic and variable) multimeter and verify with color coding printed on the body of the capacitor. LE2.6 Identify different types of transformers and identify LV and HV winding with the help of multimeter. LE2.7 Identify different types of switches suggest one application of each.

Legend: CI: Classroom Instruction (Includes different instructional strategies, i.e. Lecture (L) and Tutorial (T) and others), LI : Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-2 Suggested Sessional Work (SW):

- **Assignments:**
 - iii. Prepare chart to show the comparison of various types of resistors.
- **Mini Project:**
 - iv. Connect resistor and capacitor in series and parallel and measure the resultant value with the help of multimeter and verify the result theoretically.
 - v. Identify the LV and HV windings of step down transformer using multimeter and interpret the results.
- **Other Activities (Specify):**
 - vi. Use different type of switches and prepare different type of control circuit to switch on and off the give lamp.

CO-3 Test general purpose electronic components using Measuring instruments.**(05 Hrs)**

Session Outcomes(SOs)	Laboratory Instruction(LI)
SO3.1 Explain the steps to identify the anode and cathode leads of the given diode.	LE3.1 Use a multimeter to identify the anode and cathode of the given diode.
SO3.2 Describe the steps to measure the current gain of the given transistors.	LE3.2 Use a multimeter to identify the emitter, base, and collector of the given transistor.
SO3.3 Differentiate between LED & LCD.	LE3.3 Identify the type of package of the given IC.
SO3.4 Describe the front panel control functions of Cathode Ray Oscilloscope (CRO).	LE3.4 Measure amplitude and frequency of the given signal using CRO.
SO3.5 Describe the steps to use the CRO for frequency and amplitude measurement.	LE3.5 Generate various types of waveforms (sine, square, triangular) using a Function Generator and measure their frequency with CRO.
SO3.6 Test electronic components using CRO's component tester.	LE3.6 Compare two waveforms on the CRO screen. LE3.7 Use CRO's component tester option to test a given diode..

Legend: CI: Classroom Instruction (Includes different instructional strategies, i.e. Lecture (L) and Tutorial (T) and others), LI : Laboratory Instruction (Includes Practical performances in the Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-3 Suggested Sessional Work (SW):**● Assignments:**

- i. Prepare the chart to show the steps to use multimeter to measure DC Current and Voltage.
- ii. Prepare Chart to show the block diagram of Digital Storage Oscilloscope

● Mini Project:

- vii. Use LED, diode and transistor to build a simple application circuit.
- viii. Prepare a market survey report on 50 to 100 MHz, CRO.

● Other Activities (Specify):

- i. Show video on the working of various types of electronic display.
- ii. Demonstrate the special features of CRO and Function generator.
- iii. Demonstrate the calibration steps of the CRO.

CO-4 Test and maintain a given domestic electrical load.**(05 Hrs)**

Session Outcomes (SOs)	Laboratory Instruction (LI)
SO4.1 List various measuring tools and instrument for domestic installation	LE4.1 Use multimeter for checking of wiring continuity measurement of voltage and current
SO4.2 Select suitable wires for a given application	LE4.2 Measure the wire gauge size for the given application
SO4.3 Select suitable cable for a given load application.	LE4.3 Identify electrical wires/ cables of different current ratings and voltage grade.
SO4.4 List the wiring materials required for a given load application.	LE4.4 Identify the accessories/materials used for house wiring
SO4.5 Select illumination source for a given application.	LE4.5 Identify the different types of illumination sources and their control gear
SO4.6 List the different type of switches and circuit breakers for different application as per their current and voltage rating.	LE4.6 Identify the different types of switches and circuit breakers used for control of low power loads
SO4.7 Describe the wiring and mounting procedures on a switch board for control of electrical appliances	LE4.7 Prepare wiring circuit using modular switch board showing control of one lamp, one fan and one socket

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI : Laboratory Instruction (Includes Practical performances in the Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-4 Suggested Sessional Work (SW):

- **Assignments:**

- Collect information about the major manufacturers of Low voltage cables and LED lights
- Wire up to control an Electric bell from three locations with lamp indicators and test it.
- List the specification of various electrical and electronic home appliances.

CO-5 Perform soldering and de-soldering of discrete component on a general purpose PCB (05 Hrs)

	Laboratory Instruction (LI)
SO5.1 Describe various types of Soldering and De-soldering techniques.	LE5.1 Selection of soldering Iron and soldering flux and solder the electronic component on general purpose PCB.
SO5.2 Explain the need of flux material used in the soldering process.	LE5.2 Build simple circuit consists of discrete components on PCB.
SO5.3 Explain PCB design rules for the given open source EDA tools.	LE5.3 Use desoldering pump to take out the electronic component from general purpose PCB.
SO5.4 Describe Steps for the PCB preparation manually.	LE5.4 Design a simple PCB layout using open-source EDA tools and prepare the PCB manually.
SO5.5 Identify common soldering defects and their remedies.	

Legend: CI: Classroom Instruction (Includes different instructional strategies, i.e. Lecture (L) and Tutorial (T) and others), LI : Laboratory Instruction (Includes Practical performances in the Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-5 Suggested Sessional Work (SW):

- **Assignments:**
 - i. Compare various type of PCBs used in the electronics equipment's.
- **Mini Project:**
 - i. Prepare a small application circuit contain discrete components likes witch on the PCB.
- **Other Activities (Specify):**
 - i. Show video on the PCB preparation process.
 - ii. Show video on various types of soldering methods.

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

H) Suggested Specification Table (For ESE of Class room Instruction (CA):

Unit No.	Unit Title	Marks Distribution			Total Marks
		R	U	A	
I		-	-	-	-
II		-	-	-	-
III		-	-	-	-
IV		-	-	-	-
V		-	-	-	-
		-	-	-	-

Legend: R: Remember, U: Understand, A:Apply and above

J) Suggested Specification Table (For ESA of Laboratory Instruction*):

Laboratory Instruction Number	Short Laboratory Experiment Title	Assessment of Laboratory Work (Marks)		
		Performance (70%)		Viva-voce (30%)
		PRA	PRA	
LE1.1	Conduct mock artificial respiration and first Aid exercise to learn about safety procedures of first Aid in case of electrical/electronic hazards.			
LE1.2	Use Fire extinguisher to extinguish the fire in a given situation.			
LE1.3	Prepare a checklist of safety equipment and first-aid items required in an electronics workshop.			
LE2.1	Use multimeter to measure AC and DC voltages.			
LE2.2	Measure output voltages of the given battery.			
LE2.3	Test continuity of the given circuit with the help of multimeter.			
LE2.4	Measure resistance of the given resistor from color code And verify it using Multimeter.			
LE2.5	Measure capacitance of the given capacitor (mica, ceramic, paper, electrolytic and variable) multimeter and verify with Color coding printed on the body of the capacitor.			

LE2.6	Identify different types of transformers and identify Primary and Secondary winding with the help of multimeter.			
LE2.7	Identify different types of switches suggest one application Of each.			
LE3.1	Use a multimeter to identify the anode and cathode of the given diode.			
LE3.2	Use a multimeter to identify the emitter, base, and collector of the given transistor.			
LE3.3	Identify the type of package of the given IC.			
LE3.4	Measure amplitude and frequency of the given signal using CRO.			
LE3.5	Generate various types of waveforms (sine, square, triangular) using a Function Generator			
LE3.6	Compare two waveforms on the CRO screen.			
LE3.7	Use CRO's component tester option to test a given diode.			
LE4.1	Use multimeter for checking of wiring continuity measurement of voltage and current			
LE4.2	Measure the wire gauge size for the given application			
LE4.3	Identify electrical wires/ cables of different current ratings and voltage grade.			
LE4.4	Identify the accessories /materials used for house wiring			
LE4.5	Identify the different types of illumination sources and their control gear			
LE4.6	Identify the different types of switches and circuit breakers used for control of low power loads			
LE4.7	Prepare wiring circuit using modular switch board showing control of one lamp, one fan and one socket			
LE5.1	Selection of soldering Iron and soldering flux and solder the electronic component on general purpose PCB.			
LE5.2	Build simple circuit consists of discrete components on PCB.			
LE5.3	Use desoldering pump to take out the electronic component from general purpose PCB.			
LE5.4	Design a simple PCB layout using open-source EDA tools and prepare the PCB manually.			

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments/ practical's

Legend: PRA: Process Assessment, PDA: Product Assessment

K) Suggested Instructional/Implementation Strategies:

1. Improved Lecture Method
2. Industrial visits
3. Expert Lecture
4. Field Trips
5. Self-Learning
6. Portfolio Based Learning
7. Observation, Practice and Feedback

8. Classroom, Laboratory, Workshop, Field, Video, Live Demonstrations
9. Role Play
10. Charts
11. Demonstration ICT Based Teaching Learning (Video Demonstration, CBT, Blog) can be integrated with many methods.

L) Suggested Learning Resources:

(a) Books:

S.No.	Title	Author	Publisher	Edition & Year
1.	Introduction to Basic Manufacturing Process & Workshop Technology	Singh, Rajender	New Age International, New Delhi	2 nd Edition, Reprint 2014, ISBN: 978-81-224-3070-7
2.	Electronic Components Handbook, V1	Lewis M. Clement, Keith Henney, Craig Walsh	Literary Licensing, LLC	Edition: 2013, ISBN: 9781258554682, 1258554682
3.	Principles of Electronics	Mehta, V.K.; Mehta, Rohit	S.Chand and Co. Ram Nagar, New Delhi-110 055	11 th Edition, 2014, ISBN-13-9788121924504
4.	Electrical engineering materials and Semiconductor devices	Gupta, J.B., & Gupta, Renu	S.K. Kataria & sons	2013, ISBN-978-93-5014-300-1 or Latest edition
5.	Hand book of Electrical Engineering	Bhatia, S.L.	Khanna Publication	2012, or Latest edition
6.	Electrical Workshop	Satish Dahiya	Neelkanth Publishers Pvt. Ltd	ISBN: 8184445393, 2016
7.	Electronics Component & Devices (Hindi)	Rahul Wadhwa	Asian Publishers Ltd.	1 st Edition, 2022
8.	Electrical Workshop Calculation & Science (Hindi)	S K Jain & Kapil Dev	Computech Publications Limited	ISBN: 978-81-7317-147-5

(b) List of open source software/learning website:

1. Measuring device:<https://www.youtube.com/watch?v=3M4rsWBYaIA>
2. Types of flame:<https://www.youtube.com/watch?v=1OLppHw6GRE>
3. Transformer testing:<https://www.youtube.com/watch?v=bPhkFGwdzMM>
4. Soldering and brazing :<https://www.youtube.com/watch?v=BplzRtQAMw0>
5. www.home.howstuffworks.com/electrical-tools.htm
6. www.kpsec.freeuk.com/components/switch.htm
7. www.electronicshub.org/types-of-inductors-and-applications/
8. www.radio-electronics.com/info/data/semicond/diodes/types-of-diodes.php
9. learn.sparkfun.com/tutorials/transistors
10. Soldering:https://mightyohm.com/files/soldercomic/FullSolderComic_EN.pdf
11. Mini Project:-<http://www.eleccircuit.com>
12. Electro Schematic:-<http://www.electroschematics.com>
13. <http://www.asnu.com.au>
14. Fire extinguisher:-<http://fireextinguishertraining.com/>

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Manufacturers' operating Manual

M) List of Major Laboratory Equipment and Tools:

S.No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1.	Fire extinguisher	Mechanical foam type fire extinguisher with ISI Mark (9litter,BandCtypefire)	LE1.1&1.2
2.	Fire extinguisher	A, B, C portable type fire extinguisher with ISI mark. (2Kg)	LE1.1&1.2
3.	Multimeter	Analog and Digital ACVoltage:0-400V,DCVoltage:0-24V AC Current:0-100A, DC Current:0-20A Resistance:0-1kohm	LE2.1andLE2.2
4.	Digital Multimeter	DigitalMultimeter3and½digitwithcomponent tester	LE2.1to2.6and LE3.1to3.3,3.5
5.	Cathode ray oscilloscope (CRO)	50MHz,Dualtrace,Dualbeam,Inbuilt+-5V supply, Component tester, Function Generator	LE4.1toLE4.5
6.	Function Generator	0-2MHzwithSine,squareandtriangular wave Output with variable frequency and amplitude	LE4.1toLE4.5
7.	Soldering Gun	SolderingGun:40Watts, Holdingstand, Temperature Control, Power cord	LE5.1toLE5.3
8.	Soldering Iron	Soldering iron, Flux for soldering and Solder filler material.	LE5.1toLE5.3

S.No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
9.	De-soldering Gun	De-soldering Gun: 80Watts, output voltage 35V	LE5.1toLE5.3
10.	Consumable components	Resisters, Rheostat, Wire wound resistor, Carbon Film resistor, Carbon composition resistor capacitors, Paper Capacitor, Electrolytic Capacitor, Ceramic capacitor, Polyester Capacitor, Gang capacitor Diodes, Transistors, ICs, IC Sockets, General Purpose PCBs of different size, LEDs, Relays, Switches, Connectors, potentiometer fixed and variable, Connecting Wires, Soldering metal, Soldering Flux, De-soldering mesh.	LE 1.1 to LE 5.3
11.	Hand tool	Wire Cutter, Wire Stripper, hammer, Insulated Screw driver, Pliers , Rawal Plug, Splicers, files, Hack saw, Punch	LE 1.1 to LE5.4
12.	Standard Wire gauge	Gauge 1-36 mm	LE 4.1 to 4.6
13.	Drilling Machine	Chuck capacity 1-10 mm, power 500 watt, 1-phase 230 V	
14.	Switch Board Accessories	Switch Board Accessories Switch boards, 5/6A Switches, Lamp holders, Sockets Plug Top , Metal clad sockets, Modular Boxes 4way/6 way	LE 4.1 to 4.6
15.	Conduit Wiring accessories	Multi strand Wires, PVC conduits, Junction boxes, Inspection Bends, Elbows, Tees, saddles, clamps, Flexible conduits, Reducers, Deep Junction boxes	LE 4.1 to 4.6

N) Mapping of Pos & PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiments and practice	PO-4 Engineering Tools	PO-5 The engineer and society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and team work	PO-9 Communication	PO-10 Life-long learning	PSO-1	PSO-2
CO-1 Use firefighting equipment and other safety related accessories.	3	2	2	2	2	2	3	3	2	2	2	2
CO-2 Test general purpose electrical components (Resistor, Capacitor, Inductor and Transformer) using Multimeter.	3	3	3	2	3	1	3	2	2	2	3	3
CO-3 Test general purpose electronic components using Measuring instruments.	3	3	3	3	2	2	3	2	2	2	2	3
CO-4 Test and maintain a given domestic Electrical load.	2	3	3	3	2	1	2	2	2	2	2	2
CO-5 Perform soldering and disordering of discrete component on a general purpose PCB.	2	3	3	3	2	2	2	1	1	2	3	2

Legend:1–Low,2–Medium,3–High



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)
Diploma (Common to All Branches)
Semester-II

- A) **Course Code** : 2000B04CL022
 B) **Course Title** : Essential of Office Application (Lab)
 C) **Pre- requisite Course Code and Title** :
 D) **Rationale** :

This course aims to develop proficiency in using Microsoft Office applications for professional documentation, data analysis, and presentations. It emphasizes practical skills and real-world applications relevant to academic, business, and industrial environments.

E) **Course Outcomes:**

- CO-1 Create professional documents using basic word-processing tools.
 CO-2 Use advanced word-processing features like mail merge and multimedia.
 CO-3 Perform data organization and calculations using spreadsheet software.
 CO-4 Analyze and visualize data using advanced spreadsheet tools.
 CO-5 Develop multimedia presentations with animations and interactivity.

F) **Scheme of Studies:**

Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)				
			L	P	T	Total Study Hours (L+T+P)	Total Credits(C) (L+T+P/2)
Computer Science & Engineering	2000B04CL022	Essential of Office Application (Lab)	-	2	-	2	1

G) **Scheme of Assessment:**

Board of Study	Course Code	Course Title	Scheme of Examination					
			Theory			Practical		Total Marks
			ESE	CT	TA	ESE	TA	
Computer Science & Engineering	2000B04CL022	Essential of Office Application (Lab)	-	-	-	40	20	60

Note: Separate passing is must for Progressive and End Semester Assessment.

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course. Convert unit of the given physical quantity from one-unit system to other.

CO-1 Create professional documents using basic word-processing tools.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self-Learning (SL)
SO1.1: Use the various features of word processing software for preparing a professional document. SO1.2: Apply basic formatting features like bold, italics, underline, and font customization. SO1.3: Understand page settings, margins, headers, and footers.	Unit 1: Introduction to Word Processing (5 Hrs) 1.1 Overview of Word Processor: <ul style="list-style-type: none">Basics of Font: Type, Size, Color, Effects like Bold, Italic, Underline, Subscript, Superscript, and Case Changing Options. 1.2 Working with Text: <ul style="list-style-type: none">Inserting & Deleting, Undo and Redo.Copying and Moving (Cutting) Text within a Document. 1.3 Formatting Paragraphs: List Setting, Line Spacing. 1.4 Page Settings: Margins Setting, Header and Footer.	<ol style="list-style-type: none">Explore online tutorials on Microsoft Office Word.Practice saving files in different formats, including DOCX, PDF, and XLSX.

SW-1 Suggested Sessional Work (SW):

a. Assignments:

- Make a report file on short cut key for different word processing commands.

b. Mini Project:

- Create Prepare a learning material in form of a document on the sessions taken on word processing.

c. Other Activities (Specify):

- A Seminar on 'Features of Word processing Software'

CO-2 Use advanced word-processing features like mail merge and multimedia.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self-Learning (SL)
<p>SO2.1 Create and manage tables in a Word document.</p> <p>SO2.2 Apply Mail Merge for personalized communications.</p>	<p>Unit 2: Advanced Features in Microsoft Word Processing (5 Hrs)</p> <p>2.1 Spelling and Grammar Checks.</p> <p>2.2 Working with Tables:</p> <ul style="list-style-type: none"> ● Inserting Rows/Columns, Merging, and Splitting Cells. ● Arithmetic Calculations in a Table. <p>2.3 Working with pictures: Inserting Pictures from Files.</p> <p>2.4 Using Drawings & Objects: WordArt, Lines and Shapes, Modifying Drawn Objects, Formatting Drawn Objects.</p>	<ol style="list-style-type: none"> 1. Practice creating a table of contents and bibliography for a long document. 2. Explore how to use styles and themes to maintain consistent formatting across a document. 3. Experiment with templates available in Microsoft Word for resumes, reports, and letters.

SW-2 Suggested Sessional Work (SW):

- a. **Assignments:**
 - i. Describe mail merge feature of word processing software for sending mass letter.
- b. **Mini Project:**
 - i. Prepare a learning material in form of a document on the sessions taken on word processing.
- c. **Other Activities (Specify):**
 - i. A Seminar on 'Features of Word processing Software'

CO- 3 Perform data organization and calculations using spreadsheet software.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self-Learning (SL)
<p>SO3.1 Understand the fundamentals of spreadsheet software, including data entry and formatting.</p>	<p>Unit 3:Basics of Spreadsheets(5 Hrs)</p> <p>3.1 Introduction to spreadsheets: cell addressing, data types, and basic operators.</p> <p>3.2 Introduction to formatting:</p>	<ol style="list-style-type: none"> 1. Watch video tutorials on using Excel for financial modeling or project tracking. 2. Explore the use of conditional formatting for highlighting key data.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self-Learning (SL)
SO3.2 Format cells, rows, and columns for data organization.	Formatting Number, Text, Formatting Date & Time, Formatting Concept of Worksheet, Formatting Concept of Workbook 3.3 Understanding Formulas: Operators in a spreadsheet, Operators Precedence.	

SW-3 Suggested Sessional Work (SW) :

a. Assignments:

- i. Document the process of creating a simple budget sheet in Excel.

b. Mini Project:

- i. Design a formatted student attendance sheet with basic data analysis.

c. Other Activities (Specify):

- i. Conduct a seminar on "Spreadsheet Basics for Beginners."

CO-4 Analyze and visualize data using advanced spreadsheet tools.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self-Learning (SL)
SO4.1 Analyze data using advanced Excel functions. SO4.2 Use basic formulas and functions for calculations. SO4.3 Create and customize charts for data visualization. SO4.4 Use conditional formatting for dynamic data representation.	Unit 4: Advanced Data Representation in Spreadsheets(5 Hrs) 4.1 Understanding Functions: Common Excel Functions <ul style="list-style-type: none"> ● Math & Trig Functions such as Sum, Round, Sqrt, Power etc. ● Statistical Function such as Average, Min, Max, etc. ● Date & Time ● Lookup & Reference such as Transpose etc. 	1. Learn to use pivot tables for data summarization. 2. Practice creating dashboards using multiple charts and conditional formats.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self-Learning (SL)
	<ul style="list-style-type: none"> ● Logical Functions such as IN, AND, OR etc. ● Text Function such as Upper, <p>4.2 Types of Graphics Word Art, Auto Shapes, Images</p> <p>4.3 Introduction to charts:</p> <ul style="list-style-type: none"> ● Overview of different types of Charts Using different ● Types of Charts such as Bar Chart, Pi-Chart etc <p>4.4 Printing in spreadsheet:</p> <ul style="list-style-type: none"> ● Animations (for objects) and transitions (between slides). ● Page Setup options <p>4.5 Hyperlinks and Interactivity: Insert hyperlinks to other slides, websites, or files.</p>	

SW-4 Suggested Sessional Work (SW) :

a. Assignments:

- i. Describe the use of Spread Sheet software to create, analyze and represent it different form of charts.

b. Micro Project:

- i. Create a student result sheet using Spreadsheet software, analyses the data and represent it in form of chart with respect to scores of previous exams/test/ Assignment.

c. Other Activities (Specify):

- i. A Seminar on 'Features of Spread sheet/ Data Analysis & Chart Presentation software'

CO-5 Develop multimedia presentations with animations and interactivity.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self Learning (SL)
<p>S05.1 Design professional presentations with multimedia elements.</p> <p>S05.2 Use animations, transitions, and custom slide layouts.</p> <p>S05.3 Set up print layouts and export documents in different formats.</p>	<p>Unit 5: Multimedia/ Graphic Presentation(5 Hrs)</p> <p>5.1 Introduction to Multimedia/Graphic Presentation package</p> <p>5.1.1 Outline of an effective presentations, Starting a New Presentation Files, Saving work, Creating new Slides</p> <p>5.2 Work with textboxes</p> <p>5.2.1 Adjusting character spacing, adjusting line spacing, Formatting text boxes,</p> <p>5.2.2 Create new Slides</p> <p>5.3 Introduction to Formatting:</p> <p>5.3.1 Change a slides Layout, Applying a theme, Changing Colors, Using various types of effects, Creating and managing custom Color, Changing the background, Formatting bulleted and numbered list, Styles</p> <p>5.4 Work with Fonts</p> <p>5.4.1 Change the font size, font color, Creating and managing custom font theme & Color, Using text fill</p> <p>5.5 Work with Slides</p>	<p>i. Features of Multimedia Presentation software</p> <p>2.Advance features of Multimedia Presentation</p> <p>3..Features of drawing tools, clip art's, multimedia elements</p>

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self Learning (SL)
	<p>5.5.1 Change slides Layout, Slides Master, Slide Sorter</p> <p>5.5.2 Apply& Manage theme</p> <p>5.6 Use Drawings & Objects</p> <p>5.6.1 Word Arts, Selecting, deleting, moving, copying, resizing and arranging objects, working with drawing tools, Apply shape or picture styles, Applying object borders, Apply object fill, Apply object effects, Apply object borders</p> <p>5.7 Work with Clip Art &Picture:</p> <p>5.7.1 Insert Clip Art, Modify Clip Art, Insert & Editing Pictures</p> <p>5.8 Find and replace text, Correcting your spelling</p> <p>5.9 Use Tables</p> <p>5.9.1 Creating a new Table, Editing a table's Structure</p> <p>5.10 Work with Video</p> <p>5.10.1 Embed a video, Link to a video, Size a video, Video playback options</p> <p>5.11 Use Animation, Sound &Effects</p> <p>5.11.1 Using Custom Animation for Text & Picture</p> <p>5.11.2 Configure a sound playback, Add a digital music sound</p>	

Session Outcomes (SOs)	Laboratory Instruction (LI)	Self Learning (SL)
	track, provide Transition effects and timings, Creating hyperlinks, using action buttons	

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others) , LI : Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-5 Suggested Sessional Work (SW) :

a. Assignments:

- i. Describe the potential use multimedia presentation.

b. Micro Project:

- i. Create a short slide show of any event organized in college.

c. Other Activities (Specify):

- i. A Seminar on 'Features of multimedia presentation Software

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Specification Table (For ESA of Classroom Instruction CI+SW+SL):

Course Outcomes Number	Unit Number	Unit Titles	Marks Distribution			Total Marks
			R	U	A	
CO-1	I	Introduction to Word Processing.	-	-	-	-
CO-2	II	Advanced Features in Word Processing.	-	-	-	-
CO-3	III	Basics of Spreadsheets.	-	-	-	-
CO-4	IV	Advanced Data Representation in Spreadsheets.	-	-	-	-
CO-5	V	Multimedia Presentations.	--	-	-	-
Total			-	-	-	-

Legend: R: Remember, U: Understand, A: Apply and above

J) Suggested Specification Table (For ESA of Laboratory Instruction*):

Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)
		Performance PRA PDA
1	Create a sample academic/business letter applying text formatting (bold, italics, underline, font type, color, and size).	40
2	Insert and manipulate a table in a document with rows/columns merged and split.	
3	Add headers, footers, and adjust page margins for a professional document.	
4	Insert images and format them (resize, position, and apply effects).	
5	Use mail merge to generate personalized letters for an event invitation.	
6	Perform arithmetic operations in a Word table (e.g., adding numeric values).	
7	Insert and customize multimedia elements like WordArt, shapes, and pictures in a report.	
8	Create a formatted resume with advanced layout and styling features.	
9	Create a sample worksheet for any academic/business problem (e.g., payroll, exam results).	
10	Apply basic formulas such as SUM, AVERAGE, and MIN on a data set.	
11	Format a spreadsheet by adjusting text alignment, borders, and shading.	
12	Add hyperlinks in a spreadsheet to navigate between worksheets or external links.	
13	Use logical functions like IF, AND, OR to analyze data in a spreadsheet.	
14	Apply conditional formatting to highlight trends in a data set.	
15	Create and customize a bar chart and pie chart for sales or performance data.	
16	Use pivot tables to summarize and represent data dynamically.	
17	Create a presentation for an academic topic using text, images, and transitions.	
18	Embed a video and audio file into a presentation and configure playback settings.	
19	Add animations and slide transitions to a presentation for a college event.	
20	Use hyperlinks and action buttons to create an interactive presentation.	

Course Outcomes Number	Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
			Performance		Viva-Voce
			PRA	PDA	
CO-1	LE1.1	Create a sample academic/business letter applying text formatting (bold, italics, underline, font type, color, and size).	15	15	10
CO-1	LE1.2	Insert and manipulate a table in a document with rows/columns merged and split.	15	15	10
CO-2	LE2.1	Add headers, footers, and adjust page margins for a professional document.	15	15	10
CO-2	LE2.2	Insert images and format them (resize, position, and apply effects).	15	15	10
CO-2	LE2.3	Use mail merge to generate personalized letters for an event invitation.	15	15	10
CO-3	LE3.1	Perform arithmetic operations in a Word table (e.g., adding numeric values).	15	15	10
CO-3	LE3.2	Insert and customize multimedia elements like WordArt, shapes, and pictures in a report.	15	15	10
CO-4	LE4.1	Create a formatted resume with advanced layout and styling features.	15	15	10
CO-4	LE4.2	Create a sample worksheet for any academic/business problem (e.g., payroll, exam results).	15	15	10
CO-4	LE4.3	Apply basic formulas such as SUM, AVERAGE, and MIN on a data set.	15	15	10
CO-4	LE4.4	Format a spreadsheet by adjusting text alignment, borders, and shading.	15	15	10
CO-5	LE5.1	Add hyperlinks in a spreadsheet to navigate between worksheets or external links.	15	15	10
CO-5	LE5.2	Use logical functions like IF, AND, OR to analyze data in a spreadsheet.	15	15	10

Course Outcomes Number	Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
			Performance		Viva-Voce
			PRA	PDA	
CO-5	LE5.3	Apply conditional formatting to highlight trends in a data set.	15	15	10
CO-5	LE5.4	Create and customize a bar chart and pie chart for sales or performance data.	15	15	10
CO-5	LE5.5	Use pivot tables to summarize and represent data dynamically.	15	15	10
CO-5	LE5.6	Create a presentation for an academic topic using text, images, and transitions.	15	15	10
CO-5	LE5.7	Embed a video and audio file into a presentation and configure playback settings.	15	15	10
CO-5	LE5.8	Add animations and slide transitions to a presentation for a college event.	15	15	10

***Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practical's ,**

Legend: PRA: Process Assessment, PDA : Product Assessment

K) Suggested Instructional/Implementation Strategies:

1. Improved Tutorial Lectures,
2. Demonstration-Based Learning,
3. Case Method and
4. Group Discussions
5. ICT-Based Teaching and Learning,
6. Role Play and Brainstorming,
7. Portfolio-Based Learning
8. Other Activities

L) Suggested Learning Resources:

(a) Books :

S. No.	Titles	Author	Publisher	Edition & Year
1.	Microsoft Office 2010: On Demand	Johnson, Steve	Pearson Education, New Delhi India,	-2010. ISBN :9788131770641 or latest
2.	OpenOffice.org for Dummies	Leete, Gurdy, Finkelstein Ellen, Mary Leete	Wiley Publishing, New Delhi,	2003 ISBN : 978-0764542220 or latest

*Latest edition of all above books should be referred

(b) Open source software and website address:

- a. Microsoft office set by step Joan Lambert and Curtis
Frye <https://ptgmedia.pearsoncmg.com/images/9780735699236/samplepages/9780735699236.pdf>
- b. Open Office Suit- <http://www.openoffice.us.com/download-openoffice-free.php>
- c. MS Office: <https://www.microsoft.com/en-in/learning/office-training.aspx>
- d. Open Office Training: <http://www.tutorialsforopenoffice.org/>
- e. Star Office- https://s3-ap-southeast-1.amazonaws.com/r4ltue295xy0d/Special_Edition_Using_StarOffice_6_0.pdf
- f. Typing Master 10 in English for Windows:
<http://www.typingmaster.com/typing-tutor/free-download.html>
- g. Hindi Typing Tutor and Master <http://www.hinditypingtutor.com>

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Manufacturers' Manual
4. Users' Guide

M) List of Major Laboratory Equipment and Tools:

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1	Computer Systems	Intel Core i3 or higher, 8 GB RAM, 500 GB SSD/HDD, Windows 10 or higher.	All Practicals
2	Microsoft Word	Microsoft Office 2016 or higher, installed on all computer systems.	Experiments 1–8
3	Microsoft Excel	Microsoft Office 2016 or higher, installed on all computer systems.	Experiments 9–16
4	Microsoft PowerPoint	Microsoft Office 2016 or higher, installed on all computer systems.	Experiments 17–20
5	Printers	Laser Printer with support for A4-sized printing.	Experiments 1, 8 (for printing documents).
6	Internet Connectivity	High-speed broadband or Wi-Fi connection for online resources, cloud services, and email configurations.	Experiments 5, 9, 13, 19 (where applicable).
7	Multimedia Tools (Audio/Video Devices)	High-quality microphones, speakers, and webcams for embedding multimedia elements into presentations and audio-visual projects.	Experiments 18–20
8	Projector	LCD Projector with HDMI/VGA connectivity for demonstrating presentations.	Experiments 17–20
9	Antivirus Software	Updated antivirus software for secure file handling and system protection.	All Practicals (to ensure a safe setup).

N) Mapping of POs and PSOs with COs:6

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO-1	PSO-2
CO-1 Understand the evolution of computer systems and identify various components of a computer.	3	3	3	3	2	1	2	3	2
CO-2 Demonstrate the installation and management of hardware devices and peripheral components.	3	3	3	3	2	1	2	3	3
CO-3 Apply file and folder management techniques using operating systems.	2	3	3	3	3	1	2	3	3
CO-4 Explain basic networking concepts and troubleshoot connectivity issues	3	3	3	3	2	2	2	3	3
CO-5 Explore emerging technologies and understand their societal impact.	3	3	3	3	2	2	2	3	3

Legend: 1 – Low, 2 – Medium, 3 – High

O) Course Curriculum Map:

POs & PSOs No.	COs No. & Titles	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
PO1-7, PSO1-2	CO1: Create professional documents using basic word-processing tools.	SO1.1, SO1.2, SO1.3	LE1.1, LE1.2	CI1.1, CI1.2, CI1.3, CI1.4	As mentioned in relevant page number
PO1-7, PSO1-2	CO2: Use advanced word-processing features like mail merge and multimedia.	SO2.1, SO2.2,	LI2.1, LI2.2, LI2.3	CI2.1, CI2.2, CI2.3, CI2.4	
PO1-7, PSO1-2	CO3: Perform data organization and calculations using spreadsheet software.	SO3.1, SO3.2	LI3.1, LI3.2	CI3.1, CI3.2, CI3.3	
PO1-7, PSO1-2	CO4: Analyze and visualize data using advanced spreadsheet tools.	SO4.1, SO4.2, SO4.3, SO4.4	LI4.1, LI4.2, LI4.3, LI4.4	CI4.1, CI4.2, CI4.3, CI4.4, CI4.5	
PO1-7, PSO1-2	CO5: Develop multimedia presentations with animations and interactivity.	SO5.1, SO5.2, SO5.3	LI5.1, LI5.2, LI5.3, LI5.4, LI5.5, LI5.6, LI5.7, LI5.8	CI5.1, CI5.2, CI5.3, CI5.4, CI5.5, CI5.6, CI5.7, CI5.8, CI5.9, CI5.10, CI5.11	

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning.



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-II

- A) Course Code : 2000B06ET046
B) Course Title : Indian Constitution
C) Pre- requisite Course Code and Title :
D) Rationale :

Students across the disciplines must have awareness not only about the meaning and importance of the constitution and its need but also about the role of freedom fighters who have contributed in its making process. Our constitution is based on the principles of Liberty, Fraternity and Equality and it assures Social Justice to all of its citizens; but it is being observed that in this era of specialization, some people often ignore to respect constitutional values, duties and responsibilities. There must be a balance between Rights and Duties for sustainable co-existence on one hand, and on the other the youth must be encouraged to know the structure of the government and to participate actively in the democratic process as a responsible and aware citizen. This course designed for Diploma students aims to provide

- E) **Course Outcomes: Students will be able to:**
1. Understand the Importance of the Constitution and Develop the Values of an Ideal, Responsible Citizen within themselves
 2. Appreciate the Principles of Liberty, Fraternity and Equality in the Welfare State of India
 3. Understand the Structure and Functions of the Central and the State Governments
 4. Comprehend the Structure of Local Self-Government 'The Panchayati Raj'

F) **Scheme of Studies:**

Teaching Hrs.: 15

S.N.	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)				
				CL	TL	PL	Assessment Hrs	Total Credit L+T(P/2)
1.	Humanities	2000B06ET046	Indian Constitution	01	-	-	25	01

Legend: CL-Lecture, PL-Practical, TL-Tutorial, SLA - Self Learning Assessment

Legend: CL: Classroom Instruction (Includes different instructional strategies i.e. Lecture and others), PL: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies) TL- Tutorial includes Sessional Work(SW) (includes assignment, seminar, mini project etc.) and Self Learning (SL), C: Credits

Note: SW and SL has to be planned and performed under the continuous guidance and feedback of a teacher to ensure the outcome of Learning.

G) Scheme of Assessment:

S. No	Board of Study	Course Code	Course Title	Scheme of Examination							
				Theory			Practical			SL	Total Marks
				ESE	CT	TA	ESE	PA	TA	SLA	
1	Humanities	2000B06ET046	Indian Constitution	-	-	20	-	-	-	-	20

Legend:ESE: End Semester Exam, CT: Class Test, TA: Teacher Assessment, PA: Practical Assessment, SLA: Self-Learning Assessment

H) Course-Curriculum Detailing:

This curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CL), Laboratory Instruction (PL), TL-Tutorial includes Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Understand the Importance of the Constitution and Develop the Values of an Ideal, Responsible Citizen within themselves

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self Learning (SL)
SO-1.1 Understand the need and importance of a constitution in a democratic set-up SO-1.2 Develop awareness about the making process of the constitution SO-1.3 Inculcate the values of a responsible citizen	Unit 1: Introduction to the Indian Constitution Hours: 03 1.1 Definition of 'Constitution'; it's Need and Importance in a Democratic set up 1.2 Brief History of the Making Process of the Indian Constitution	Watching videos, lectures interviews and articles of eminent freedom fighters to appreciate their efforts for India's own constitution

SW1- Suggested Sessional Work (SW):

a. Assignments

1. Discussion, followed by a write up on the need of a constitution
2. An essay on the Constituent Assembly

b. Mini Project:

1. A Mini Project on the role of an aware and responsible citizen

c. Other Activities (Specify):

1. Group Discussion on the role of a constitution to safeguard the interest of the citizens

CO-2 Appreciate the Principles of Liberty, Fraternity and Equality in the Welfare State of India

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self-Learning (SL)
SO-2.1 Develop competency to understand the values and principles incorporated in the Constitution of India SO-2.2 Be aware of the Fundamental Rights and Directive Principles of the state SO-2.3 Perform the duties as expected in the Constitution	Unit 2: Salient features of the Indian Constitution Hours: 03 2.1 Important characteristics of the Indian Constitution 2.2 Fundamental Rights and Duties 2.3 Directive Principles	Study of Learning Material available on Internet, Reference Books and Other Sources

SW2- Suggested Sessional Work (SW):

- a. **Assignment:**
Listing the salient features of the Indian Constitution
- b. **Mini Project:**
Making a comparison of Democracy with other forms of governance
- c. **Other Activities (Specify):**
Group Discussion on the role of citizens to perform their constitutional duties

CO-3 Understand the Structure and Functions of the Central and the State Governments

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self-Learning (SL)
SO-3.1 Understand the difference between a Presidential and a Parliamentary Democracy SO3.2 - Develop awareness about different organs of the government and their functions SO3.3 - Understand the role of the Election Commission; Separation and Distribution of Powers between the Centre and the States	Unit 3: Structure of the Government Hours: 03 3.1 A Parliamentary Democracy 3.2 Federal and Unitary Features 3.3 The President 3.4 Organs of the Government: Legislature, Executive and Judiciary 3.5 Structure of State Governments/UTs Unit 4: Functions of the organs of Government Hours: 03 4.1 Distribution of Powers: Center List, State List and Concurrent List 4.2 Election Commission and its role 4.3 Functions of the Legislature, the Executive and the Judiciary	<ol style="list-style-type: none"> 1. Reading Articles from Newspaper Magazines and Passages from Books on the related topics 2. Watching TV News Bulletins and Programs to develop awareness about the functioning of the government at the centre and states

SW3- Suggested Sessional Work (SW):

- a. **Assignments:**
Preparation of a write up on the discussion and approval on a Money Bill
- b. **Mini Project:**
Process to describe the formation of central government in India
- c. **Other Activities (Specify):**
Group Discussion on the role of the Election Commission of India

CO-4 Comprehend the Structure of Local Self-Government ‘The Panchayati Raj’

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self-Learning (SL)
SO4.1 Understand the provisions of the ‘Panchayati Raj’ in the Constitution SO4.2 Develop awareness about the structure and role of Zila Panchayat, Janpad Panchayat and Gram Panchayat SO4.3 Develop awareness about the structure and role of urban bodies: Municipal Corporations and Municipalities	Unit 5: Local Self-government: The Panchayati Raj Hours: 03 4.1 Zila Panchayat 4.2 Janpad Panchayats 4.3 Gram Panchayats 4.4 Municipal Corporations and Municipalities	1. Study of the related provisions of the constitution 2. Observe the working of the local body to understand the democratic process

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW4: Suggested Sessional Work (SW) :

- a. **Assignments:**
 - i. Writing essays on the functions of the above mentioned local bodies
- b. **Mini Project:**
Observe the working of the local body where you live and suggest the officials to make it more effective as per the provisions
- c. **Other Activities (Specify):**
Role-play in a mock setup of the meeting of a Gram Panchyat

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Instructional, Implementation Strategies

1. Group Discussion
2. Role Play
3. ICT Based Teaching Learning
4. Brainstorming

J) Suggested Learning Resources:

(a) Books :

1. Introduction to the Constitution of India; D D Basu, LexisNexis
2. Indian Polity; M. Laxmikant, McGraw Hill
3. 'Indian Constitution at Work'; NCERT

(b) Reference Books/Sources in Hindi:

1. भारतीय संविधान एवं राज व्यवस्था; दृष्टि पब्लिकेशंस, दिल्ली
2. भारत का संविधान: एक परिचय; दुर्गादास बसु, Lexis Nexis
3. भारत का संविधान: सिद्धांत और व्यवहार, NCERT

(c) MOOCs Courses Links:

1. <https://nptel.ac.in>
2. <https://swayam.gov.in>
3. <https://coursera.org>

(d) Web Addresses for Reference:

- <https://www.india.gov.in>
www.constitutionofindia.net



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-II

- A) Course Code : 2000B07FT046
B) Course Title : Universal Human Values I
C) Pre- requisite Course Code and Title :
D) Rationale :

India has a very rich history of its culture, traditions and values based on the always revered principle of 'वसुधैव कुटुंबकम्' in this heterogeneous and all- inclusive society. Unfortunately, in the materialistic race of comforts and luxuries, there is a growing tendency to usurp the rightful space of others at world level and India has been no exception. Study of Value Education has become more important than ever in this age of specialisation where it finds a very limited space for itself. We must understand that 'Humanity' is above all and the respect for Universal Human Values must be encouraged for respectful co-existence and sustenance. This course designed for Diploma students aims to prepare technicians with Human Values so that they may contribute more to the society with ethics and values.

E) **Course Outcomes: Students will be able to:**

1. Appreciate the Benevolent and All-inclusive Culture of India

2. Develop the Spirit of Tolerance, Co-operation, Co-existence and Respect for Human Values

3. Describe different aspects of Global Citizenship

F) **Scheme of Studies:**

Teaching Hours: 30

S.N.	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)				
				CL	TL	PL	Assessment Hrs	Total Credit L+T(P/2)
1.	Humanities	2000B07FT046	Universal Human Values I	2	-		10	-

Legend: CL-Lecture, PL-Practical, TL-Tutorial, SA - Assessment Hrs

Legend: CL: Classroom Instruction (Includes different instructional strategies i.e. Lecture and others), PL: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies) TL- Tutorial includes Sessional Work(SW) (includes assignment, seminar, mini project etc.) and Self Learning (SL), C: Credits

Note: SW and SL has to be planned and performed under the continuous guidance and feedback of a teacher to ensure the outcome of Learning.

G) Scheme of Assessment:

S. No	Board of Study	Course Code	Course Title	Scheme of Examination							
				Theory			Practical			SA	Total Marks
				ESE	CT	TA	ESE	PA	TA	SA	
1	Humanities	2000B07FT046	Universal Human Values I	-	-	20	-	-	-	-	20

Legend: ESE: End Semester Exam, CT: Class Test, TA: Teacher Assessment, PA: Practical Assessment, SA: Assessment Hrs

H) Course-Curriculum Detailing:

This curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CL), Laboratory Instruction (PL), TL-Tutorial includes Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Appreciate the Benevolent and All-inclusive Culture of India

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self Learning (SL)
<p>SO-1.1 Explain the Need and Importance of Universal Human Values</p> <p>SO-1.2 Develop Awareness about the Holistic Approach of the Traditional Indian Philosophy based on 'वसुधैव कुटुंबकम्'</p> <p>SO-1.3 Explore and Respect the Relation between 'Prakriti' and 'Purush' for the Protection of Our Environment</p>	<p>Unit 1: Introduction to the Human Values: Need and Importance Hours: 04</p> <p>1.1 The Concept of 'Human Values'; it's Need and Importance</p> <p>1.2 Recognised Human Values</p> <p>Unit 2: Human Values in Indian Culture and Traditions Hours: 06</p> <p>2.1 Brief History of the Indian Traditional Darshan</p> <p>2.2 Harmony across the Religions in the Heterogeneous Indian Society</p> <p>2.3 Concern for the Co-existence with Man, Animals and Nature: 'Prakriti' and 'Purush' in Traditional Indian Culture</p>	<p>Study of Traditional Indian Philosophy Hindu Darshan (viz.Sankhya, Yoga , Vedanta, Geeta etc)</p> <p>Exploration of the Common Features across the Religions for the Protection of Human Values</p> <p>Sources available on Internet may be explored to understand the established Universal Human Values</p>

SW1- Suggested Sessional Work (SW):

a. Assignments

1. Discussion, followed by a write up on the need of inculcating Human Values
2. An essay on the Co-existence of Prakriti and Purush' in the Indian Culture

b. Mini Project:

1. A Mini Project on the efforts you can make to promote human values in the society

c. Other Activities (Specify):

1. Group Discussion on the common features in different religions to safeguard the human values in the society

CO-2 Develop the Spirit of Tolerance, Co-operation, Co-existence and Respect for Human Values

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self Learning (SL)
SO-2.1 Explain the Values and Principles Incorporated in the Constitution of India SO-2.2 Discuss the Fundamental Rights and Directive Principles of the Indian Constitution SO-2.3 Perform the Duties of an Ideal Citizen as Expected in the Constitution SO- 2.4 Appreciate the Role of India in the Protection of Human Rights and Values across the Globe	Unit 3: Indian Constitutional Values and the Role of India in Global Welfare Activities Hours: 10 3.1 Concept of Liberty, Fraternity and Equality in the Indian Constitution: Fundamental Rights and Duties, Directive Principles, Secularism and the concept of a Welfare State to Promote Harmony and Co-existence 3.2The Spirit of Co-existence across Nations: India's Assistance to other Countries viz. Peace Keeping Force, Providing Medicines and Participation in Global Welfare Activities	Study of Learning Material available on Internet, Reference Books and Other Sources

SW2- Suggested Sessional Work (SW):

a. Assignment:

Listing the features of the Indian Constitution that promote the spirit of Co-existence

b. Mini Project:

Prepare a mini project on the recent steps taken by India to assist different nations in need

c. Other Activities (Specify):

Group Discussion on the role of citizens to perform their constitutional duties

CO-3 Describe different aspects of Global Citizenship

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (P/L)	Self Learning (SL)
SO-3.1 Highlight the Importance of Global Citizenship SO3.2 Identify the Core Values inherent in Global Citizenship	Unit 4: The Concept of Global Citizenship Hours: 10 4.1 The Importance of Global Citizenship 4.2 Different Aspects of Global Citizenship: Civic Responsibilities, Cultural Awareness, the Environment, and the Global Economy	<ol style="list-style-type: none">1. Reading Articles from Newspapers, Magazines and Books on the related topics2. Watching TV News Bulletins and Programs to develop awareness about the UHVs

I) Suggested Instructional, Implementation Strategies

1. Group Discussion
2. Writing Compositions on Professional Ethics
3. ICT Based Teaching Learning
4. Brainstorming

J) Suggested Learning Resources:

(a) Books :

1. Dagar, B.S and Dhull, I. (1994). Perspectives in Moral Education. Uppal Publishing House, New Delhi.
2. Gogate, S.B. (2011). Human Values and Professional Ethics. Vikas Publishing House, New Delhi.
3. Sinha, K. (2021). Human Values and Virtues in Indian Perspectives. B.R. Publishing Corporation
4. UGC. Mulya Prawah 2: Incultation of Human Values and Professional Ethics in Higher Education Institutions

(b) Reference Books/Sources in Hindi:

1. मूल्य प्रवाह 2: उच्च शिक्षा के लिए नैतिकता और मूल्य; विश्वविद्यालय अनुदान आयोग
2. शिक्षा तथा मानव मूल्य; डॉ बी एस डागर, हरियाणा ग्रन्थ अकादमी, पंचकुला

(c) MOOCs Courses Links:

1. <https://nptel.ac.in>
2. <https://swayam.gov.in>
3. <https://coursera.org>

(d) Web Addresses for Reference:

<https://egyankosh.ac.in>

<https://ignou.ac.in>



Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches) Semester-II

Course Code: 2000B05FL046

Course Title : Sports and Social/ Community Services

Course Objectives

This course aims to develop physical fitness and a sense of social responsibility, empathy, and civic engagement among students. Sports activity builds strength, stamina, teamwork, and agility while services encourages them to understand community needs, work collaboratively on real-life problems, and contribute meaningfully to society.

Syllabus & Activities:

(a) Sports

The sports component of this course focuses on enhancing physical fitness, coordination, and teamwork through a variety of structured games and activities. Participants will engage in individual and team sports such as athletics, badminton, volleyball, and basketball, aimed at building endurance, agility, and strategic thinking. Emphasis will be placed on sportsmanship, discipline, and the development of motor skills, while also promoting an active and healthy lifestyle through regular participation and practice.

(b) Social/community services

The social/community services component of this course will include orientation sessions on social issues such as sanitation, environmental conservation, digital literacy, rural development, and health awareness. Students will engage in fieldwork with NGOs, local self-government bodies, or campus-based community projects. Activities may involve cleanliness drives, tree plantation, basic technology workshops for the underprivileged, assisting in disaster relief preparedness, or creating low-cost solutions for local problems. The program will conclude with a reflective report and presentation, where students analyze their contribution, challenges faced, and lessons learned for future community-oriented work.