Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-1

A) Course Code : 2000A01AT011

B) Course Title : Applied Chemistry

C) Pre- requisite Course Code and Title :

D) Rationale : The objective of teaching Applied Science in the Polytechnic syllabus is to equip students with a strong foundation in Chemistry, emphasizing their practical applications in engineering and technology. This course bridges the gap between theoretical concepts and real-world problem-solving, enabling students to understand the scientific principles behind modern innovations. By fostering critical thinking, analytical skills and hands-on experimentation, Applied Science empowers students to approach technical challenges with confidence. The ultimate goal is to prepare future professionals who can apply scientific knowledge effectively in their respective fields, contributing to technological advancements and sustainable development.

E) Course Outcomes:

CO-1 Solve various engineering problems applying the basic knowledge of atomic structure and Solution.

CO-2 Use relevant water treatment method to solve industrial problems and the basic knowledge of Chemical Bonding.

CO-3 Solve the engineering problems using concept of Electrochemistry and Use relevant types of Batteries for industrial applications.

CO-4 Solve the engineering problems by applying the knowledge of metallurgical process and use relevant types of Metals Alloys for industrial applications.

CO-5Use relevant types of fuels, lubricants, paints and varnishes for industrial applications.

F) *Scheme of Studies:*

S.No.	Board of study	Course code	Course Title	Scheme of studies (Hours per week)			
				L	P	T	Total Credit
1.	Applied Chemistry	2000A01AT011	Applied Chemistry	4		-	4
2.	Applied Chemistry	2000A04AL011	Applied Chemistry Lab		2	-	1

G) ***Scheme of Examination:***

S.No.	Board of study	Course code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1.	Applied Chemistry	2000A01AT011	Applied Chemistry	100	20	20	-	-	140
2.	Applied Chemistry	2000A04AL011	Applied Chemistry Lab	-	-	-	40	20	60

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 various engineering problems applying the principles and basic knowledge of atomic structure and Solution.

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

Session Outcomes (SOs)	**Laboratory Instruction (P)**	**Class room Instruction (L)**	**Self-Learning (SL)**
SO1.1 Determine the Electronic structure of the given atom for the material used in industry. SO1.2 Calculate the Quantum numbers for various energy levels of industrially applicable metals.	LE4.1 Determine the normality of given solution. LE4.2 Determine the Morality of given sample.	**Unit -1 (A) Atomic structure** 1.1 Atomic structure, 1.2 Electronic structure of atoms, electrons, protons and neutrons. 1.3 Rutherford model and its limitation 1.4 Bohr's model 1.5 Bohr's – Burry scheme of distributions of electrons. 1.6 Heisenberg's uncertainty principle 1.7 Quantum numbers 1.8 Distribution of electrons in sub-shells and concept of electronic configuration of atoms (Atomic no. 1 -30) 1.9 Aufbau's rule, 1.10 Pauli's exclusion principle. 1.11 Hund's rule of maximum Multiplicity. **1.1 (B) Solution**	• Electrons, protons and neutrons.

		1.1 Definitions of solute, solvent, solution and concentration, 2.1 Modes of expressing concentration of solutions - Molarity (M = moles/liter) Normality (N), Molality (m), mass, Molecular weight, Equivalent weight	

SW-1 Suggested Sessional Work(SW):

i. Assignments:

I. Write electronic structure of the given atoms.
II. Prepare a chart showing atomic number (1 to 30), Name of the element, Symbol, Electronic Configuration of elements in tabular form.

ii. Mini Project:

I. Prepare Rutherford model and Bohr's – Burry models.
II. Prepare a model of an atom with the help of a ball and stick or any other items.
III. Prepare a different concentration of solutions.

iii.Other Activities (Specify):

I. Prepare a chart of the modern periodic table which gives information about the atomic number and mass number of different elements.
II. Seminar on Solution and concentration.
III. Determine the molecular and equivalent weight of H_2SO_4, NH_4OH, KCl, and NaOH.

CO-2 Use relevant water treatment method to solve domestic and industrial problems and basic knowledge of Chemical bonding.

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

Session Outcomes (SOs)	**Laboratory Instruction (P)**	**Class room Instruction (L)**	**Self-Learning (SL)**
SO2.1 Perform Water softening for the industrial hard water. SO2.2 Use the relevant water treatment method for municipal water SO 2.3 Use theory of chemical bonding for identification of different properties material used in the industries.	LE5.1 Determine total hardness, temporary hardness and permanent hardness of water sample by EDTA method. LE5.2 Determine the Alkalinity of given water sample. LE5.3 Determine the turbidity in given water sample by Nephelometric method. LE5.4 Determine the total dissolved and suspended solids in given water sample. LE5.5 Determine the	**Unit-2 (A) Water treatment** 2.1 Sources of water, hard water and Soft water. 2.2 Types of hardness of water (Temporary/Carbonate harness and Permanent/Non-carbonate hardness), 2.3 Units of hardness. 2.4 Problems caused by the use of hard water in boilers and its prevention: i. Scale and sludge formation, ii. Priming and Foaming, iii. Caustic embrittlement, iv. Boiler Corrosion. 2.5 Water softening techniques: i. Soda-lime process,	SO1.1 Hardness SO1.2 Types of Hardness SO1.3 . Chemical bond SO1.4 Types of chemical bonds

.	Biological oxygen demand in the given water sample.	ii. Zeolite (Permutit) process, iii. Ion-exchange/De-ionization process, 2.6 Treatment of Municipal drinking water: 2.6.1 Screening, 2.6.2 Sedimentation 2.6.3 Coagulation 2.6.4 Filtration 2.6.5 Sterilization of water by Chlorination, Ozone treatment 2.7 Biological oxygen demand and Chemical oxygen demand **2(B)- Chemical bond** 2.1 Concept of chemical bond, Octet rule, 2.2 Types of chemical bonds: 2.2.1 Ionic (Electrovalent) bond and its characteristics (Example NaCl, $MgCl_2$) 2.2.2 Covalent bond and its characteristics (examples-non-polar covalent bond: Cl_2, O_2, N_2.Polar covalent bond: HCl, H_20 and NH_3.), 2.2.3 Coordinate covalent (Dative) bond (examples - NH_3, BF_3) 2.2.4 Hydrogen bond, its types and significance.	

SW-2 Suggested Sessional Work (SW):

5 Assignments:

I. Preparemodeltofindthesoapfoamingcapacityofborewateronadditionofsodaash.
II. Prepare a chart of different types of chemical bond.

- *Mini Project:*
  I. Collect water samples from different water sources and find the characteristics like acidity, conductivity, dissolved solids, suspended particles.
  II. Collect3to5watersamplestofindthedosageofbleachingpowderrequiredforitssterilization.
- *Other Activities (Specify):*
  I. Seminar on impurities in municipal water.
  II. Visit the municipal water treatment plant.
  III. Visit the DM water plant.

CO-3Solve various engineering problems using concept of Electrochemistry and Use relevant types of Batteries for industrial applications.

(Approx. Hrs:L+P+T=18)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO3.1 Explain the Redox reaction. SO3.2 Describe acid base concept. SO3.3 Explain the Buffer solution. SO3.4 Describe the factors affecting Conductance. SO3.5 Explain Electrical conductance in metals and Electrolytes SO3.6 Describe the different types of Electrodes. SO3.7 Describe the Conductometric Titration. SO3.8 Describe different types of Batteries. SO3.9 Explain Construction and Working of Dry Cell.	LE1.1 Determine the conductance of the given solution by conductometric titration. LE1.2 Determine the conductivity of given water sample. LE1.3 Determine the pH of different solution using glass electrode.	**Unit-3 (A)** **Electrochemistry** 3.1 Arrhenius theory of ionization. 3.2 Electronic concept of oxidation, Reduction, and redox reactions. 3.4 Acid base concept: Arrhenius, Bronsted-Lowry, Lewis 3.5 Concept of pH and pOH; pH scale for Acids, bases and neutral solutions. 3.6 Buffer solutions, Types of buffer Solutions: Acidic buffers and Basic Buffers, Applications of buffer Solutions. 3.7 Conductance: 3.7.1 Nature of solute, 3.7.2 Nature of solvent, 3.7.3 Temperature, 3.7.4 Concentration or dilution. 3.8 Electrical conductance in metals And electrolytes, 3.9 Electrodes: A Construction and working of Standard Hydrogen Electrode (SHE). Calomel electrode, Glass electrode. 3.10 Conductometric Titration **Unit-3 (B) Batteries:** 3.1 Types of Batteries: Primary, Secondary 3.2 Construction and Working of Dry cell. 3.3 Construction and Working of Lead-acid storage cell.	pH Acid base concept: ● Arrhenius ● Bronsted-Lowry ● Lewis Conductance: ● Nature of solute ● Nature of solvent ● Temperature ● Concentration ordilution Types of Batteries: ● Primary ● Secondary

SW-3 Suggested Sessional Work(SW):

a. Assignments:

i. Prepare the chart displaying pH scale for different Acid and Basic medium found in daily life.
ii. Prepare the chart displaying working of Standard Hydrogen Electrode (SHE), Calomel electrode and Glass electrode.

b. *Mini Project:*

i. Collect the samples of different types of liquids found in daily life and prepare a report on their pH.
ii. Collect the samples of different types of electrodes used in various batteries and prepare a report on

their conductance.

c. *Other Activities (Specify):*

i. Organize quiz on pH.
ii. Organize quiz on Electrolyte.
iii. Organize Quiz on Conductivity.

CO-4 Solve the engineering problems by applying the knowledge of metallurgical process and use relevant types of Metals Alloys for industrial applications.

(Approx. Hrs.: L+P+T=18)

Session Outcomes (SOs)	**Laboratory Instruction (P)**	**Class room Instruction (L)**	**Self-Learning (SL)**
SO4.1 Explain the basic principles of metallurgy. SO4.2 Explain the different type of Ferrous alloy. SO4.3 Explain the different type of non-ferrous alloy.	LE2.1 Determine the Percentage of copper in given copper ore by brass titration. LE2.2 Standardization of $KMnO_4$ solution using standard oxalic acid and determine the percentage of iron present in given Hematite ore by $KMnO_4$ solution.	**Unit-4 (A) Metallurgy** 4.1 Metallurgy: 4.1.1 Mineral 4.1.2 Ore 4.1.3 Gangue 4.1.4 Flux 4.1.5 Slag 4.2 Basic principles of Metallurgy 4.3 Metallurgical process of Iron 4.4 Metallurgical process of copper **Unit- 4 (B) Metal Alloys** 4.1 Introduction 4.2 Purpose of making an Alloy 4.3 Ferrous alloys: 4.3.1 Low carbon 4.3.2 Medium carbon 4.3.3 High carbon steels. 4.4 Non-ferrous alloy: 4.4.1 Brass 4.4.2 Bronze 4.4.3 Duralumin 4.4.4 Tinman Solder 4.4.5 Woods metal	● Mineral and Ore ● Iron and Copper ores ● Properties of metals.

SW-4 Suggested Sessional Work (SW):

a. Assignments:

i. Prepare chart showing properties of refractory materials.
ii. Prepare chart showing different industrial applications of metals.
iii. Prepare chart showing percentage composition, properties and industrial applications of different types of steel.

b. Mini Project:

iv. Find the percentage of Iron in different types of iron ore.
v. Find the effect of alloying elements like Mn, Cr, Ni, W, V, Co on properties of steel.

c. Other Activities (Specify):

i. Organize quizon metal properties and ores.

ii. Visit Metal industries to learn metallurgy process.
iii. Organize quizon metal Alloys

CO-5 Use relevant types of fuels, lubricants, paints and varnishes for industrial applications.

(Approx. Hrs: L+P+T=18)

Session Outcomes (SOs)	**Laboratory Instruction (P)**	**Class room Instruction (L)**	**Self-Learning (SL)**
SO5.1 Test the properties of the given lubricant for industrial applications. SO5.2 Identify the different ingredients of paints and varnish for engineering. SO5.3 Select the relevant fuel for industrial applications. SO5.4 Test the quality of coal for industrial uses.	LE3.1 Determine the effect of temperature on viscosity for given lubricating oil using Redwood viscometer LE3.2 Determine the flash and fire point of given lubricating oil using Cleavland open cup apparatus. LE3.3 Determine the cloud and pore point of the given lubricant. LE3.4 Determine the moisture content, ash and volatile matter in given coal sample using proximate analysis. LE3.5 Determine the calorific value of the given solid fuel using Bomb calorimeter	**Unit-5.0 (A) Lubricants, Paints and Varnishes** 5.1 Lubricant- 5.1.1Types, 5.1.2Liquid 5.1.3Solid 5.1.4Semisolid 5.1.5 Theory of Lubrication. 5.1.6 Properties of a Good lubricants 5.1.7 Flash and Fire Point. 5.1.8 Pour paint and Cloud Point. 5.1.9Viscosity. 5.2 Paints and Varnish Constituents, Properties And uses. **5(B) Fuel and Combustion** 5.1 Fuel: Calorific value and ignition temperature, classification. 5.2 Solid fuels: Coal, Classification and composition 5.2.1 Proximate analysis 5.2.2 Ultimate analysis 5.2.3 Bomb calorimeter 5.2 4 Carbonization of coke by Otto Hofmann's Oven. 5.3 Liquid fuels: 5.3.1 Fractional distillation of crude petroleum 5.3.2 Boiling range 5.3.3 Composition and Properties. 5.3.4 Knocking, 5.3.5 Cracking 5.3.6 Octane number and Cetane number. 5.4 Gaseous fuels: 5.4.1 Biogas, LPG, and CNG.	• Classification of fuel. • Solid fuel classification. • Octane number and Cetane number.

SW-5 Suggested Sessional Work (SW):

a. Assignments:

i. Prepare the comparative chart of commercially available lubricants on the basis of mechanism of lubrication.
ii. Prepare the chart displaying applications of different paints and Varnish.

***b.** Mini Project:*

i. Collect the sample of various lubricants and prepare the report about properties and uses.
ii. Prepare chart showing different types of liquid fuels their calorific values and uses.
iii. Prepare a chart differentiating proximate and ultimate analysis of Coal.
iv. Find out the flash and fire point, cloud point, pour point and viscosity of the same. Compare the properties and justify their use in relevant applications.

***c.** Other Activities (Specify):*

i. Visit the paint industry.
ii. Conduct Quiz on lubricants, paints and varnishes.

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

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	Atomic Structure and Solution	**8**	**7**	**5**	**20**
ii	Water Treatment and Chemical bonding	**5**	**6**	**9**	**20**
iii	Electrochemistry and Batteries	**5**	**8**	**7**	**20**
iv	Metallurgy and Metal Alloys	**4**	**9**	**7**	**20**
v	Lubricants, Paints & Varnishes, Fuels	**8**	**7**	**5**	**20**
Total		**30**	**37**	**33**	**100**

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

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

Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
		Performance		Viva-Voce
		PRA	PDA	
LE1.1	Titration	10	10	5
LE1.2	Alkalinity	10	10	5
LE2.1	Complexometric Titration (EDTA)	10	10	5
LE2.2	BOD	15	05	5
LE2.3	TDS	15	05	5
LE3.1	Conductometric Titration	10	10	5
LE3.2	Conductometer	10	10	5
LE3.3	pH meter	10	10	5
LE4.1	E.M.F. (Daniel cell)	10	10	5
LE4.2	Brass Titration	10	10	5
LE5.1	Bomb calorimeter	15	05	5

LE5.2	Proximate analysis	10	10	5
LE5.3	Redwood viscometer-I	10	10	5
LE5.4	Cleaveland open cup	10	10	5
LE5.5	Cloud and pore point	10	10	5
LE5.6	Fractional distillation	15	05	5

* 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

Note: Only one experiment has to be performed at the end semester examination of **25 Marks** as per assessment scheme

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**:

S. No.	Titles	Author	Publisher	Edition & Year
1	Engineering Chemistry	Agarwal, Shikha	Cambridge university press ; New Delhi,	2015
2	Engineering Chemistry	Dara, S. S. and Dr.S.S.Umare	S.Chand. Publication, New Delhi,	2015
3	Engineering Chemistry	Jain & Jain	Dhanpat Rai and sons; New Delhi	2015
4	Engineering Chemistry	Dr.Vairam, S.	Wiley India Pvt.Ltd., New Delhi\	2013
5	Chemistry for engineers	Agnihotri, Rajesh	Wiley India Pvt.Ltd.	2014
6	अनुप्रयुक्त रसायन विज्ञान	डा. हेमलता पाण्डेय	दीपक प्रकाशन	
7	अनुप्रयुक्त रसायन विज्ञान	डा. एसबी सक्सेना	दीपक प्रकाशन	
8	रसायन विज्ञान	केके पाण्डेय	दीपक प्रकाशन	
9	रसायन	डा. हेमलता पाण्डेय	दीपक प्रकाशन	

(b) Open-source software and website address:

1. www.chem1.com/acad/webtext/elchem/ec6.html (Electrochemistry and batteries)
2. www.em-ea.org/guide%20books/book 2/2.1%20fuels%20and%20combustion.pdf (Fuel and Combustion)
3. www.chemcollective.org (Metals, Alloys)

(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 Equipments	Broad Specifications	Relevant Experiment Number
1	Electronic balance	Scale range of 0.001g to 500g. pan size 100 mm; response time 3-5 sec.; power requirement 90-250 V, 10 watts.	All
2	Incubator	Temperature 5^0C to 6^0C, air circulation motorized blower, standard fittings main ON/OFF switch load indicator Fan ON/OFF switch, Power supply 220 volts 50 Hz	LE 5.2
3	Distillation unit	Capacity 1.5 lt.	All
4	Electric Oven	inner size 18''x18''x18''; temperature range 100 to 250^0 C. with the capacity of 40lt.	All
5	Electronic balance	scale range of 0.001g to 500g. pan size 100 mm; response time 3-5 sec.; power requirement 90-250 V, 10 watts.	All
6	Conductometer	Range 0-199.9ms; resolution 0.1ms/0.01ms/0.001ms/0.1µs/0.01µs; accuracy ±0.5% ±2 digits	LE1.1
7	pH meter	Working range 0-14; resolution 0.1/0.01 pH; temperature compensation 0-100^0 C	LE1.2
8	Redwood viscometer	Suitable to operate at 220 volts AC mains with tap ; stainless steel jet; cup cover; thermometer ; electronic digital indicator; controller etc	LE 3.1
9	Cleavland open cup apparatus	Energy regulator-to regulate the rate of rise in temperature; 220V; 50 Hz; single phase; AC supply	LE 3.2
10	Cloud and Pour point apparatus	Energy regulator, to regulate the rate of rise in temperature,200V,50Hz, single phase, AC supply etc.	LE3.3
11	Bomb Calorimeter	Measurement unit J/kg, cal/gm, BTU/Ib; temp. resolution 0.0001^{0}C or better; combustion bomb-halogen and acid resistant stabilized stainless steel; resolution 0.001kcal/gm; measurement range up to 40,000 J/gm	LE3.4
8	Muffle furnace	Temperature up to 900^{0}C, digital temperature controller with an accuracy of +/- 3^{0}C	LE3.5

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-I

A) Course Code : 2000A02AT014

B) Course Title : Basic Mathematics

C) Pre-requisite Course Code and Title :

D) Rationale :

Mathematics has the potential to understand the core technological studies. This course of Applied Mathematics-I is being introduced as a foundation, which will help in developing the requisite course outcomes to most of the Diploma programs, and hence caters to the needs of the industry enhancing the employability. It will help the students to apply the principles of the fundamental engineering mathematics to solve related technology problems. The course will give the students an insight to apply and analyze the Engineering problems scientifically based on Determinants, Matrices, Differential Calculus, Co-ordinate Geometry and Fundamentals of the Statistics.

E) Course Outcomes:

CO-1 Solve engineering related problems based on concepts of Algebra.

CO-2 Use basic concepts of Differential Calculus to solve engineering related problems.

CO-3 Compute maxima, minima, tangent and normal for engineering related problems.

CO-4 Solve engineering problems under given conditions of straight lines and conic sections.

CO-5 Use basic concepts of Statistics to solve 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	2000A02AT014	Basic 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	CourseTitle	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Applied Mathematics	2000A02AT014	Basic 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 SessionalWork (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 engineering related problems based on concepts of Algebra.

(Approx.Hrs:08)

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction (L)	Self-Learning (SL)
SO1.1 Calculate the area of the given triangle by determinant method. SO1.2 Solve given system of linear equations using Cramer's rule. Solve given system of linear equations using matrix Inversion method.		**Unit-1.0 Algebra** 1.1 Determinants 1.11 Concept and properties of determinants 1.12 Solution of simultaneous equations in three unknowns by Cramer's rule 1.2 Matrices 1.21 Algebra of Matrices 1.22 Inverse of Matrices 1.23 Solution of Simultaneous equations by matrix inversion method of Order 3x3	• Solution of simultaneous equations by determinants • Solution of simultaneous equations by matrix

SW-1 Suggested Sessional Work (SW):

a. Assignments:

i. Expound examples of determinant in day today life.
ii. Explore the use of simultaneous equations by matrix method in daily life.
iii. Expound examples of inverse of matrix for real world problems.

b. Mini Project:

i. Prepare charts using determinants to find the area of triangle.
ii. Prepare flowcharts for solutions of system of equations by matrix method.
iii. Prepare models using matrices to solve simple problems based on Cryptography.

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 MATH-CAD as mathematical tool to solve the problems of differential calculus.
IV. Seminar on basic applications of matrices
V. Seminar on application of algebra to engineering related problems.

CO-2 Use basic concepts of Differential Calculus to solve engineering related problems.

(Approx.Hrs.:08)

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction(L)	Self-Learning (SL)
SO2.1Utilize basic concepts of trigonometry to solve given elementary engineering problems. SO2.2 Calculate limit of given functions. SO2.3Obtain derivatives of given function of functions.	--	**Unit-2.0 Differential Calculus** 2.1 Basic Trigonometry 2.11 Multiple and sub multiple angles 2.2 Functions and Limits 2.21 Independent and dependent variables 2.22 Different types of functions 2.23 Concept of Limit and its evaluation 2.3 Differentiation of elementary functions 2.31 Differentiation of Algebraic, Trigonometric, Exponential and Logarithmic functions 2.32 Differentiation of sum, product, quotient of two functions 2.33 Differentiation of function of a function	● Limit for given function of one variable ● Derivatives of given Algebraic, Trigonometric, Exponential and Logarithmic functions

SW-2 Suggested Sessional Work (SW):

a. Assignments:

I. Enumerate the value of the limit for given function of one variable.
II. Explore the applications of derivative of given Algebraic, Trigonometric, Exponential and Logarithmic functions in engineering.

b. Mini Project:

i. Prepare charts showing formulas of multiple and sub multiple trigonometric functions.
ii. Prepare graphical representation for the existence of limits of given functions.

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 calculus.
III. Use MATH-CAD as mathematical tool to solve the problems of differential calculus.
IV. Seminar on engineering applications of derivatives of functions.

CO-3 Compute maxima, minima, tangent and normal for engineering related problems.

(Approx.Hrs:11)

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction (L)	Self-Learning(SL)
SO3.1 Calculate second order derivatives of given functions. SO3.2 Apply the concepts of differentiation to find the equation of tangent and normal for given problem. SO3.3 Utilize the concepts of differentiation to calculate maxima and minima for given function under certain conditions.	--	**Unit-3.0 Applications of Differential Calculus** 3.1 Second order derivatives-Second order derivatives(without examples) 3.2 Equation of Tangent and Normal 3.21 Equation of Tangent and Normal for functions of one variable only 3.3 Maxima and minima 3.31 Maxima and minima for functions of one variable only	● Applications of derivatives ● Maximum and minimum value of given Functions

SW-3 Suggested Sessional Work (SW):

a. Assignments:

i. Explore the role of differentiation to second order derivatives.
ii. Analyze the equation of tangent and normal for given function and expound what it reflects.
iii. Calculate the maximum and minimum value of given function for engineering related problems.

b. Mini Project:

I. Prepare flow charts showing method of getting maximum and minimum value of given function.
II. Prepare graph for tangent and normal for given function.
III. Prepare model showing the application of tangent and normal to bending of roads in case of sliding of vehicle.

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 calculus and related topics.
III. Use MATH-CAD as mathematical tool to solve the problems of applications of differential calculus.
IV. Seminar on the engineering applications of maxima and minima.
V. Seminar on applications of tangent and normal for engineering related problems.

CO-4 Solve engineering problems under given conditions of straight lines and conic sections.

(Approx.Hrs.:10)

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction(L)	Self-Learning(SL)
SO4.1 Calculate angle between given two straight lines. SO4.2 Obtain parallel distance between the given two Parallel lines. SO4.3 Form the equation of circle under given conditions. SO4.4 Calculate the parameters of given parabola and ellipse.		**Unit-4.0. Co-ordinate Geometry** 4.1 Various forms of straight lines 4.11 Co-ordinate systems, slope point form, two-point form 4.12 Distance between two points, division of a line segment Two points intercepts form, General form 4.13 Two points intercepts form, General form 4.14 Perpendicular distance from a point on the line, perpendicular distance between two parallel lines 4.2 Conicsections 4.21 Definition, standard forms 4.22 General equation 4.23 Center and radius of a circle 4.24 Focus, axis, directrix, latus rectum and vertex of Parabola and ellipse	● Co-ordinate geometry of straight lines and given conic sections ● Parameters of focus, axis, directrix, vertex and latus rectum of ellipse and parabola

SW-4 Suggested Sessional Work (SW):

□ **Assignments:**

i. Enumerate the angle and distance between two lines.
ii. Prepare a model showing various forms of equation of circle under given conditions.
iii. Write the specific features of the parameters like focus, axis, directrix, vertex and latus rectum of ellipse and parabola.

□ **Mini Project:**

i. Prepare flow charts showing different forms of straight lines.
ii. Prepare graph for plotting ellipse and parabola.

□ **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 MATH-CAD as mathematical tool to solve the problems of differential calculus.
iv. Seminar on the conversion of different forms of straight lines.
v. Seminar on charts showing method of getting maximum and minimum value of given function.

CO5 Use Basic Concepts of Statistics to solve engineering related problems.

(Approx.Hrs:08)

Session Outcomes (SOs)	Laboratory Instruction (P)	ClassroomInstruction(L)	Self-Learning(SL)
SO5.1 Draw the graph for given frequency distribution (distributions). SO5.2 Calculate mean, median and mode for the given set of observations. SO5.3 Calculate standard deviation for given set of engineering problems. SO5.4 Determine the variance and coefficient of variance of grouped and ungrouped data.	--	**UNIT 5.Fundamentals of Statistics** 5.1 Frequency distribution and central tendency 5.11 Introduction, graphical representation of frequency distribution 5.12 Central tendency, mean, median, frequency distribution and mode 5.2 Dispersion and deviation 5.21 Measure of dispersion. 5.22 Range,quartile deviation. 5.23 Standard deviation, root mean square deviation 5.3 Variance and coefficient of variance 5.31 Variance and coefficient of variance	● Frequency distribution and central tendency ● Standard Deviation for the given frequency distribution

SW-5 Suggested Sessional Work (SW):

□ **Assignments:**

i. Prepare detail report on frequency distribution for the given data.
ii. Represent the given frequency distribution in graphical form.
iii. Enumerate the mean, median and mode of the given data.
iv. Write the importance of calculating standard deviation for the given frequency distribution to engineering applications.
v. Analyze variance and coefficient of variance of the given data to industry specific problems.

□ **Mini Project:**

i. Prepare charts for grouped and ungrouped data.
ii. Prepare chart showing mean, median and mode values of given data.
iii. Prepare frequency curves like histogram, frequency polygon and o give by graphical method.

□ **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 MATH-CAD as mathematical tool to solve the problems of differential calculus.
iv. Seminar on different types of dispersion and deviations.
v. Seminar on applications of central tendencies likes mean, median and mode for engineering related problems.

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	Algebra	2	6	12	20
II	Differential Calculus	2	6	12	20
III	Applications of Differential Calculus	2	6	12	20
IV	Co-ordinate Geometry	2	6	12	20
V	Fundamentals o fStatistics	2	6	12	20
Total		**10**	**30**	**60**	**100**

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

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. 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	अन्‌प्रय्‌क्त गणित प्रथम	विकास 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	Fundamentals of Mathematical Statistics	S. C. Gupta	S. Chand & Sons	2014

b) O**pen 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
1. www.easycalculation.com

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Manufacturers' Manual
4. Users' Guide
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) List of Major Laboratory Equipment and Tools: NA

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

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 engineering related problems based on concepts of Algebra.	SO1.1 SO1.2		Unit-1.0 Algebra 1.1,1.2	As mentioned in relevant pages
PO-1, 2,3,8,9,10 PO-10 PSO------	CO-2 Use basic concepts of Differential Calculus to solve engineering related problems.	SO2.1 SO2.2 SO2.3		Unit-2.0 Differential Calculus 2.1,2.2,2.3	
PO-1, 2,3,8,9,10 PSO---------	CO-3 Compute maxima, minima, tangent and normal for engineering related problems.	SO3.1 SO3.2 SO3.3		Unit-3.0 Applications of Differential Calculus 3.1,3.2,3.3	
PO-1, 2,3,8,9,10 PO-10 PSO------	CO-4 Solve engineering problems under given conditions of straight lines and conic sections.	SO4.1 SO4.2 SO4.3 SO4.4		Unit-4.0Co-ordinate Geometry 4.1,4.2	
PO-1,2,3,8,9,10 PSO------	CO-5 Use basic concepts of Statistics to solve engineering related problems.	SO5.1 SO5.2 SO5.3 SO5.4		Unit-5.0 Fundamentals of Statistics 5.1,5.2,5.3	

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma in Engineering (Common to all branches)
Semester-I

A) Course Code : 2000A03CT022
B) Course Title : Fundamentals of Computer & Information Technology
C) Pre- requisite Course Code and Title :
D) Rationale :

This course is designed to provide a comprehensive understanding of computer systems, their components, and their role in modern technology. It aims to build foundational knowledge of hardware, software, and networking, enabling students to operate and manage computer systems effectively. By the end of the course, students will be able to understand the evolution of computers, identify and configure hardware peripherals, manage files and directories using popular operating systems, and troubleshoot basic networking issues. The course also introduces emerging technologies, fostering an awareness of their social impact. This knowledge will prepare students to confidently work in IT environments and adopt best practices for system maintenance and data security.

E) Course Outcomes:

CO-1 Understand the evolution of computer systems and identify various components of a computer.

CO-2 Demonstrate the installation and management of hardware devices and peripheral components.

CO-3 Apply file and folder management techniques using operating systems.

CO-4 Explain basic networking concepts and troubleshoot connectivity issues.

CO-5 Explore emerging technologies and understand their societal impact.

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 Engg.	2000A03CT022 2000A02CL022	Fundamentals of Computer & Information Technology	2	2	-	2+2	3

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 Engg.	2000A03CT022 2000A02CL022	Fundamentals of Computer & Information Technology	100	20	20	40	20	200

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 **Understand the evolution of computer systems and identify various components of a computer.**

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO1.1 Define and explain the generations of computers and their evolution. SO1.2 Identify and describe the components of a computer's block diagram (CPU, VDU, keyboard, mouse). SO1.3 Explain the memory hierarchy and differentiate between primary and secondary memory. SO1.4 Understand the concept of	LE1.1 Identify and explain the purpose of each component in the block diagram of a computer system. LE1.2 Assemble a basic computer system using provided hardware parts and verify its functionality. LE1.3 Create, save, and retrieve data files in a text editor.	**Unit 1: Introduction to Computer Systems** 1.1 **Generations of Computers and Their Evolution:** computer generations (First to Fifth), key technological advancements in each generation, evolution of hardware, software,and storage. 1.2 **Block Diagram and Components of a Computer**: block diagram of a computer system, function of each component-CPU: Control Unit, ALU,	1. Research advancements in computer architecture from first-generation to current trends. 2. Watch tutorials on computer assembly and troubleshooting. 3. Create and edit sample data files to understand basic

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
data vs. information and classify numeric and alphanumeric data.		Registers, Input devices: Keyboard, mouse – types and functionalities, Output devices: Monitor – CRT, LCD, LED, Printers – Dot Matrix, Inkjet, Laser. 1.3 **Memory Systems**: Primary memory: RAM, ROM – characteristics and uses, Secondary memory: Hard drives, SSDs, and external drives, Cache and Virtual Memory: Role and significance in performance, memory hierarchy (Registers, Cache, Main Memory, Secondary Storage). 1.4 **Basics of Data and Information**: data and its types: Numeric (integers, floats), Alphanumeric(characters, symbols), distinction between data and information, binary data representation.	file handling.

SW-1 Suggested Sessional Work (SW):

a. Assignments:

i. Compare and contrast the five generations of computers focusing on hardware and software advancements.

ii. Draw and label the block diagram of a computer system with detailed descriptions of each component.

b. Mini Project:

i. Create a presentation explaining the evolution of input and output devices with examples (e.g., CRT to LED monitors, dot matrix to laser printers).

c. Other Activities (Specify):

i. Create flashcards on memory types and hierarchy for peer learning.
ii. Hands-on session to identify primary and secondary memory in a PC.

CO-2 Demonstrate the installation and management of hardware devices and peripheral components.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO2.1 Describe the functionality of various peripherals such as keyboards, scanners, printers, and webcams. SO2.2 Demonstrate the installation and usage of plug-and-play devices. SO2.3 Explain the purpose of device drivers and identify different cable types. SO2.4 Access BIOS settings and modify configurations as needed.	LE2.1 Connect and configure peripherals like a scanner, printer, and webcam to a computer. LE2.2 Install drivers for a new input/output device and verify its operation. LE2.3 Access and navigate BIOS settings to modify boot order or enable/disable hardware components. LE2.4 Reset BIOS settings to default and document the process.	**Unit 2: Hardware and Peripheral Devices** 2.1 **Overview of Peripheral Devices**: various peripherals: Keyboards, scanners, printers, web cameras, speakers, input and output devices based on functionality. 2.2 **Plug-and-Play Devices and Drivers**: concept of plug-and-play, purpose of device drivers and demonstrate installation, common cable types used in peripherals (USB, HDMI, Ethernet), types of expansion slots: PCI, Pie, and AGP. 2.3 **BIOS and System Utilities**: BIOS and its role in booting, navigating BIOS to modify basic settings (boot order, enabling/disabling devices), system utilities like disk cleanup, defragmentation, and system restore.	1. Research different types of peripherals and their usage scenarios. 2. Practice connecting peripherals to a personal computer or simulator. 3. Watch videos on BIOS configuration and system utilities.

SW-2 Suggested Sessional Work (SW) :

a. Assignments:

i. Research and document the latest plug-and-play devices and their advantages.
ii. Write a report on the role of device drivers and their importance in modern computing.

b. Mini Project:

i. Build a diagram showcasing the components and connections of a motherboard, including slots and chips.

c. Other Activities (Specify):

i. Demonstrate BIOS setup and settings in a lab.
ii. Install and test plug-and-play devices like USB drives and webcam.

CO- 3 Apply file and folder management techniques using operating systems.

Session Outcomes (SOs)	**Laboratory Instruction (LI)**	**Class room Instruction (CI)**	**Self-Learning (SL)**
SO3.1 Understand the basics of popular operating systems like Windows and Linux. SO3.2 Perform basic file and folder operations using both GUI and CLI. SO3.3 Configure system settings and understand the role of antivirus software. SO3.4 Navigate and manage directory structures efficiently.	LE3.1 Perform file operations: create, copy, move, rename, and delete files and folders using GUI and CLI. LE3.2 Search for specific files using filters like date, size, or type and create shortcuts for quick access. LE3.3 Install and configure a dual-boot system with Windows and Linux. LE3.4 Install antivirus software, scan a system for threats, and quarantine or delete infected files.	**Unit 3:Operating Systems and File Management** 3.1 **Basics of Popular Operating Systems**: features of Windows and Linux, role of an operating system in resource management. 3.2 **File and Folder Management**: creating, renaming, and deleting files and folders using Windows GUI, directory structures and absolute vs. relative paths in CLI. 3.3 **Configuring System Settings**: desktop management: Setting themes, changing desktop icons, creating and managing user accounts. **3.4 Introduction to**	1. Practice using command-line tools for file management. 2. Research the latest antivirus software and their features. 3. Explore different desktop environments of Windows and Linux.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
		Virus & Antivirus: Virus & its type, Antivirus Firewall.	

SW-3 Suggested Sessional Work (SW) :

a. Assignments:

i. Compare Windows and Linux in terms of user interface, security, and customization.

ii. Perform basic file operations using both Windows GUI and Linux CLI and submit a detailed comparison report.

b. Mini Project:

i. Develop a guide for beginners on configuring desktop settings and managing user accounts.

c. Other Activities (Specify):

i. Install and configure antivirus software; schedule scans.

ii. Debate on the merits of open-source vs proprietary operating systems.

CO-4 Explain basic networking concepts and troubleshoot connectivity issues.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO4.1 Explain basic networking concepts like LAN, WAN, MAN, and WLAN. SO4.2 Identify and describe the purpose of networking devices like hubs, switches, routers, and modems. SO4.3 Troubleshoot common internet connectivity issues.	LE4.1Identify and explain the function of switches, routers, and modems. LE4.2Use command-line tools like ping, tracert, and ipconfig to analyze network performance. LE4.3 Explore browser settings such as bookmarks, history, extensions, and default search engines. LE4.4 Create a new email account, organize emails using folders, and set up automatic filters.	**Unit 4: Networking Fundamentals** 4.1 **Introduction to Computer Networks**: concepts of networks, types (LAN, WAN, MAN),advantages and applications of networking. 4.2 **Networking Devices:**routers, switches, hubs its function, network topologies: Star, Ring, Bus, etc.	1. Practice basic troubleshooting of network devices and connectivity issues. 2. Research privacy settings on social networking platforms. 3. Experiment with collaborative tools like

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO4.4 Understand browser settings, advanced search techniques, and email management.		4.3 **Internet Basics and Connectivity**: URL, domain names, IP addresses, and ISPs, Wi-Fi and Bluetooth functionality, common internet connectivity issue and its troubleshooting. 4.4 **Using Web Browsers and Search Engines**: browser settings: Bookmarks, history, and security configurations, advanced Google searches (e.g., file type, site-specific). **4.5 Email and Collaborative Tools:** email account setup and organizing emails into folders, netiquette for professional email communication, video conferencing tools like Zoom or Microsoft Teams.	Google Meet and Zoom.

SW-4 Suggested Sessional Work (SW) :

a. Assignments:

i. Illustrate a small LAN setup including devices like routers and switches.
ii. Explain the differences between LAN, WAN, and WLAN with real-world examples.

b. Micro Project:

i. Configure a small network in the lab and demonstrate troubleshooting connectivity issues.

c. Other Activities (Specify):

i. Advanced search techniques using Google (file types, site-specific searches).
ii. Create and organize email accounts, set up folders, and learn professional email communication.

CO-5 Explore emerging technologies and understand their societal impact.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO5.1 Understand the basics of IoT, AI, and machine learning. SO5.2 Explain the concept and applications of cloud computing. SO5.3 Explore the societal impact of computers through case studies. SO5.4 Understand initiatives like Cyber security and Mission Digital India.	LE5.1 Upload, share, and retrieve files using a cloud storage service (e.g., Google Drive or One Drive). LE5.2 Explore online tools for secure browsing, like VPNs and multi-factor authentication.	**Unit 5: Emerging Technologies and Applications** 5.1 **Overview of Iota, AI, and Machine Learning**: IoT and examples like smart homes and wearable devices, basics of AI and its applications (e.g., chatbots, recommendation systems), machine learning concepts and discuss its role in predictive analytics. 5.2 **Basics of Cloud Computing**: cloud computing and its service models (SaaS, IaaS, PaaS), cloud storage (Google Drive, OneDrive) for file sharing. 5.3 **Impact of Computers in Society**: applications in book publishing, data analysis, and multimedia production, role of computers in various industries (education,	2. Research real-life applications of IoT and AI in industry. 3. Explore cyber security tools and methods for secure browsing. 4. Read articles and watch videos on Mission Digital India and its impact.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
		healthcare, entertainment). 5.4 **Case Studies**: a. Cyber security: Discuss common threats (phishing, ransom ware) and preventive measures. b. Mission Digital India: Objectives and achievements of the initiative.	

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. Write a report on the societal impact of IoT and AI, citing current trends.
ii. Compare cloud storage services (e.g., Google Drive vs OneDrive) based on features and usability.

b. Micro Project:

i. Develop a mini-case study on cyber security threats (e.g., ransom ware) and propose preventive measures.

c. Other Activities (Specify):

i. Discuss the "Mission Digital India" initiative and its implications.

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	UnitTitles	Marks Distribution			Total Marks
			R	U	A	
CO-1	**I**	Introduction to Computer Systems	8	6	6	20
CO-2	**II**	Hardware and Peripheral Devices	6	8	6	20
CO-3	**III**	Operating Systems and File Management	8	6	6	20

CO-4	**IV**	Networking Fundamentals	6	6	8	20
CO-5	**V**	Emerging Technologies and Applications	8	6	6	20
	Total		**36**	**32**	**32**	**100**

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

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

Course Outcomes Number	Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
			Performance		Viva-Voce
			PRA	PDA	
CO-1	1	Identify and explain the purpose of each component in the block diagram of a computer system	15	15	10
CO-1	2	Assemble a basic computer system using provided hardware parts and verify its functionality	15	15	10
CO-1	3	Create, save, and retrieve data files in a text editor	15	15	10
CO-2	4	Connect and configure peripherals like a scanner, printer, and webcam to a computer	15	15	10
CO-2	5	Install drivers for a new input/output device (e.g., printer, scanner) and test the device's operation	15	15	10
CO-2	6	Access and navigate BIOS settings to modify boot order or enable/disable hardware components	15	15	10
CO-2	7	Reset BIOS settings to default and document the process.	15	15	10
CO-3	8	Perform file operations: create, copy, move, rename, and delete files and folders using GUI and CLI	15	15	10
CO-3	9	Search for specific files using filters like date, size, or type and create shortcuts for quick access	15	15	10
CO-3	10	Install and configure a dual-boot system with Windows and Linux	15	15	10
CO-3	11	Explore and modify system settings such as themes, user accounts, and desktop icons	15	15	10
CO-3	12	Install antivirus software, scan a system for threats, and quarantine or delete infected files	15	15	10
CO-4	13	Identify and explain the function of switches, routers, and modems.	15	15	10
CO-4	14	Use command-line tools like ping, tracert, and ipconfig to analyze network performance.	15	15	10
CO-4	15	Test internet speed and document the results for different network types (LAN, WLAN).	15	15	10
CO-4	16		15	15	10

Course Outcomes Number	Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
			Performance		Viva-Voce
			PRA	PDA	
		Explore browser settings such as bookmarks, history, extensions, and default search engines.			
CO-4	17	Perform advanced search operations on Google (e.g., using filters like date, file type, and site-specific searches).	15	15	10
CO-4	18	Create a new email account, organize emails using folders, and set up automatic filters.	15	15	10
CO-4	19	Practice email netiquettes: sending professional emails, using CC/BCC, and avoiding spam.	15	15	10
CO-4	20	Set up a video conferencing session using tools like Zoom, Google Meet, or Microsoft Teams.	15	15	10
CO-4	21	Explore privacy settings on popular social networking platforms and configure security measures.	15	15	10
CO-5	22	Upload, share, and retrieve files using a cloud storage service (e.g., Google Drive or OneDrive).	15	15	10
CO-5	23	Explore online tools for secure browsing, like VPNs and multi-factor authentication.	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 /practicals ,**

Legend: PRA: Process Assessment, PDA : Product Assessment

K) Suggested Instructional/Implementation Strategies:

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

L) Suggested Learning Resources:

(a) **Books** :

S. No.	Titles	Author	Publisher	Edition & Year
1.	Computer Fundamentals	Goel, Anita	Pearson Education, New Delhi,	2014, ISBN-13: 978-8131733097
2.	Computer Course	Ravi Kant Taxali	Tata McGraw Hills. New Delhi.	Year 2014 or latest
3.	Fundamentals of computers	V. Rajaraman, NeehariKaAdabal a	PHI	6 th Edition 2014 or latest
4.	Computer Basics Absolute Beginner's Guide, Windows 10	Miller, Michael	QUE Publishing;	8th edition August 2015, ISBN: 978-0789754516 or latest
5.	The Internet Book	Douglas Comer	Prentice Hall	Year 2007 or latest
6.	Computer Fundamentals	Pradeep K Sinha	BPB Publication	Year 2004 or latest
7.	कंप्युटर फन्डामेंटल्स संकल्पनाएँ, प्राणालियां एवं ऐप्लकैशन (थिओरी/लैब)	प्रदीप के सिन्हा प्रीति सिन्हा	बीपीबी पब्लिकेशन	Year 2004 or latest
8.	मूलभूत कंप्यूटर तथा उपयोजन	संकल्प गुप्ता, नूरेश कुमार देवांगन	दीपक पब्लिकेशन	Year 2025 or Latest

*Latest edition of all above books should be referred

(b) Open source software and website address:

a. Fundamentals of computers- V. Rajaraman,NeeharikaAdabala https://books.google.co.in/books?id=rGjkBQAAQBAJ&dq=Fundamentals+of++computers&source=gbs_navlinks_s

b. Computer course, Ravi Kant Taxali https://books.google.co.in/books/about/COMPUTER_COURSE.html?id=PfHftdSmNBkC&redir_esc=y

c. Computer Fundamentals Tutorials- https://www.arstecb.com/book_argment/com_fun.pdf

d. Computer fundamentals, P.K. Sinha http://www.edutechlearners.com/computerfundamentals-p-k- sinha-free-pdf/

e. yping Master 10 in English for Windows: http://www.typingmaster.com/typingtutor/free- download.html

f. 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	Desktop Computer System	Intel i5 Processor, 8GB RAM, 256GB SSD, 1TB HDD	1, 2, 3, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23
2	Maintenance Tool Kit	Screwdrivers, anti-static wrist straps, pliers, air blower	2, 3
3	Diagnostic Software	Open-source tools like HWiNFO, Speccy, HWMonitor	12, 13
4	BIOS/UEFI Configuration Tool	Pre-installed BIOS/UEFI in desktop systems	6, 7
5	Hard Drives (HDD and SSD)	SATA 1TB HDD, 256GB SSD	10
6	Peripherals (Printer, Scanner, Webcam, etc.)	Inkjet Printer, Flatbed Scanner, USB Webcam	4, 5
7	Networking Tools	LAN cables (Cat5e/Cat6), RJ45 connectors, crimping tools	13, 14, 15
8	Wireless Peripherals	Bluetooth mouse, keyboards	16
9	Antivirus Software	Open-source or proprietary antivirus software	12
10	Video Conferencing Tools	Zoom, Google Meet, Microsoft Teams (software-based setup)	20
11	Cloud Storage Tools	Cloud accounts like Google Drive or OneDrive	22
12	External Storage Devices	USB Drives, External HDDs	10, 22
13	VPN Tools	Open-source or proprietary VPN software	23
14	Networking Devices	Switches, routers, modems	13
15	Browser Software	Popular browsers like Google Chrome, Firefox, Microsoft Edge	16, 17

N) Mapping of POs and PSOs with COs:

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	2	1	2	1	0	0	2	2
CO-2	Demonstrate the installation and management of hardware devices and peripheral components.	3	3	2	3	2	0	0	3	2
CO-3	Apply file and folder management techniques using operating systems.	2	2	3	3	2	1	0	3	3
CO-4	Explain basic networking concepts and troubleshoot connectivity issues	3	3	3	3	2	2	1	3	3
CO-5	Explore emerging technologies and understand their societal impact.	3	2	2	2	3	1	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)
PO-1,2,4,7 PSO---1,2	**CO1: Understand the evolution of computer systems and identify various components of a computer.**	SO1.1, SO1.2, SO1.3, SO1.4	LI1.1, LI1.2, LI1.3	CI1.1, CI1.2, CI1.3, CI1.4	As mentioned in relevant page number
PO-1,2,3,4,7 PSO---1,2	**CO2: Demonstrate the installation and management of hardware devices and peripheral components.**	SO2.1, SO2.2, SO2.3, SO2.4	LI2.1, LI2.2, LI2.3, L2.4	CI2.1, CI2.2, CI2.3	
PO-1,2,3, 4,7 PSO---1,2	**CO3: Apply file and folder management techniques using operating systems.**	SO3.1, SO3.2, SO3.3, SO3.4	LI3.1, LI3.2, LI3.3, LI3.4	CI3.1, CI3.2, CI3.3, CI3.4	
PO-1,2,3, 4,7 PSO---1,2	**CO4: Explain basic networking concepts and troubleshoot connectivity issues**	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	
PO-1,2,3,4,7 PSO---1,2	**CO5: Explore emerging technologies and understand their societal impact.**	SO5.1, SO5.2, SO5.3, SO5.4	LI5.1, LI5.2	CI5.1, CI5.2, CI5.3, CI5.4	

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-I

A) Course Code : 2000A05DT046

B) Course Title : Communication Skills

C) Pre- requisite Course Code and Title :

D) Rationale :

Communication Skills in English is one of the core skills to be developed in Diploma graduates as students exchange information and convey their ideas and opinions with different stakeholders. In recent years English has emerged as a language of communication to exchange ideas, information and views amongst top and middle level management in organizations/institutions. It is now imperative to be proficient in communication skills to perform effectively at these platforms. Students in technical institutes need to be trained to be proficient in these skills. Many industrial surveys have indicated that most of the pass outs from educational institutions are found to be lacking in soft skills especially in Communication Skills, thus adversely affecting their efficiency and effectiveness at work.

The present curriculum focuses on the attainment of course outcomes related to Speaking, Reading, Writing and listening, so that the students become confident, self-reliant and capable of communicating in varied situations.

E) Course Outcomes:

CO-1 Use elementary grammar to form correct sentences in communication.

CO-2 Demonstrate LSRW Skills using professional and technical words from the prescribed Passages.

CO-3 Develop Creative Writing Skills using learnt words from the prescribed stories.

CO-4 Demonstrate a clear understanding of the principles and models of effective communication in personal, academic and professional contexts

CO-5 Apply appropriate Verbal and Non-verbal communication skills while communicating with others and use active listening skill as effective tool of interpersonal communication.

F) Scheme of Studies: Scheme of Studies:

Teaching Hours: 60

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	2000A05DT046	Communication Skills	3	1	-	10	4

Legend: CL-Lecture, PL-Practical, TL-Tutorial

Legend:CL: Classroom Instruction (Includes different instructional strategies i.e. Lecture and other), 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 & SL has to be planned and performed under the continuous guidance and feedback of 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	2000A05DT046	Communication Skills	50	10	10	-		-	-	70

Legend:ESE: End Semester Exam, CT: Class Test, TA: Teacher 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 (L), Laboratory Instruction (P), T- Tutorial and it also 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 Use elementary grammar to form correct sentences in communication.

Hours -12

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction (L)	Self Learning (SL)
SO1.1 Make grammatically correct sentences SO1.2 Distinguish and use various determiners SO1.3 Use the correct form of voice in sentences. SO1.4 Match suitably the verb with its subject So1.6 Supply correct prepositions in Sentences.	Practice on Language Lab Software	**Unit 1: English Grammar** Hours: 12, 1.1 Determiners 1.2. Tenses 1.3. The Passive 1.4. Subject-Verb Agreement. 1.5. Prepositions	Developing compositions using learnt grammar

SW-1 Suggested Sessional Work (SW):

a. Assignments:

i. Fill in the blanks, Multiple-choice Questions on Determiners, Tenses, Passive Voice, Subject-verb agreement etc.

b. Mini Project:

i. Express views by describing an incident using proper grammar.
ii. Select a topic and share views on the same with the audience. (2-3 min.)

c. Other Activities (Specify):

i. Practice speaking skills in front of a mirror for self-feedback.

CO-2 Demonstrate LSRW Skills using professional and technical words from the prescribed Passages.

Hours -12

Session Outcomes (SOs)	**Laboratory Instruction (P)**	**Classroom Instruction (L)**	**Self Learning (SL)**
SO2.1 Improve LSRW Skills SO2.2 Improve Vocabulary SO2.3 Develop Awareness about Advancements in the Society.	Practice on Language Lab Software	**Unit 2: Passages for Comprehension** Hours: 12, 2.1. The Language of Science 2.2. Entrepreneurship 2.3. Our Environment.	**Summarize the passages as mentioned in Classroom Instructions**

SW-2 Suggested Sessional Work (SW):

a. Assignments:

i.Loud reading of the given passages one by one in the class; Students will listen to the passages carefully and use the newly learnt words.

i. Answer questions from the prescribed chapters.

Mini Project:

Study and interpret documents, newspapers etc. for understanding the prescribed content.

c. Other Activities (Specify):

Group discussion, Debate and Extempore on current topics.

CO-3 Develop Creative Writing Skills using the learnt words from the prescribed stories.

Hours -12

Session Outcomes (SOs)	**Laboratory Instruction (P)**	**Classroom Instruction (L)**	**Self Learning (SL)**
SO3.1 Express Views in Written and Oral Forms after Reading the Prescribed Stories. SO3.2 Comprehend the Stories to Appreciate Literature. SO3.3 Exhibit the Procedure of Summarizing SO3.4 Write Short as well as Long Answers to the Given Questions.		**Unit 3: Short Stories** Hours: 12, 3.1. An Astrologer's Day 3.2. The Selfish Giant 3.3. A Letter to God	Summarize the stories as mentioned in Classroom Instruction.

SW-3 Suggested Sessional Work (SW):

a. Assignments:

i. Loud reading of given stories by each student in the class. Students will listen to the story carefully and summarize the moral of the story.
ii. Answer questions from the prescribed chapters.

b. Mini Project:

A group of students will select some short stories from Panchtantra or another interesting source. Each student will read a different story loudly. It will be reproduced/narrated by another student turn wise which will be audio recorded through mobile etc. The Teacher will act as a facilitator.

c. Other Activities (Specify):

Discussion on the stories using learnt words and literary techniques.

CO-4 Demonstrate a clear understanding of the principles and models of effective communication in personal, academic and professional contexts. Hours:12

Session Outcomes (SOs)	**Laboratory Instruction (P)**	**Classroom Instruction (L)**	**Self Learning (SL)**
SO 4.1 Understand the Principles of Communication SO 4.2 Use different Skills for effective Communication SO 4.3 Understanding the Barriers in Communication and Overcoming them	4.1 Interpret & communicate instructions to others in Oral and Written Form. 4.2 Demonstrate appropriate etiquettes while working in team.	**Unit-4.Effective Communication** Hours: 12, 4.1 Communication: and it's Objectives 4.2 Elements of Communication Process. 4.3 Seven Cs of Communication 4.4 Different Communication Skills: ● Listening, ● Speaking, ● Reading ● Writing 4.5 Barriers in Communication and Overcoming them	1.Exchange opinion on the 7 Cs of Communication 2.Role-play to identify Communication Barriers among classmates

SW- 4 Suggested Sessional Work (SW):

a. Assignments:

i. Understanding the role of Effective Communication in the Work place.
ii. Explain the statement: “In today’s competitive world LSRW Skills provide key to success in career”.
iii. Prepare for an participate in a mock job interview with a peer or instructor.

b. Mini Project

Recorded Lecture, Presentation, Discourse from different channels like Peace of Mind/Astha, may be recorded and played in the class. Students may be asked to listen and answer the questions.

c. Other Activities (Specify):

Group discussion on different topics can be arranged by the teacher like Skills Development & Youth, PM Skill Development Mission, Importance of Soft Skills, Professional Ethics & Values, Being Human, Environmental Protection, Gender Bias, Improving Presentation Skills etc.

CO-5 Apply appropriate Non-verbal communication skills while communicating with others and Use active listening skill as effective tool of interpersonal communication.

Hours: 12

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction (L)	Self Learning (SL)
SO 5.1 Express Views using Verbal and Non- verbal Skills SO 5.2 Use Effective Techniques for Active Listening	1.Deliver extempore speech of short duration (2 min) using appropriate Verbal & Non-verbal Communication.	**Unit 5: Non Verbal Communication** Hours: 12, Unit 5.0 **Non-verbal Communication** 5.1 Static Features of Non Verbal Communication ● Distance ● Posture ● Physical Contact Body Language, Signs, Symbols, Gesture etc. 5.2 Dynamic Features of Non Verbal Communication: ● Head & Hand movement ● Eye Contact ● Facial Expression ● Gestures ● Mannerism etc. 5.3 Listening versus Hearing	● Use Non Verbal features to communicate ● Identify the merits of effective listening

SW- 5 Suggested Sessional Work (SW):

a. Assignments:

i. Discuss various factors affecting Listening.

ii. Collection of pictures and visuals with static and dynamic feature of non-verbal communication.List down the dos & don'ts to be taken care of for attending counseling.

iii. Interpretation of gestures, posture and facial expression in given photograph and visual.

b. Mini Project

i. Seminar on topics related to "Role of Non-Verbal communication for developing effective communication in technical education."

c. Other Activities (Specify):

Recognize and express emotions through facial expressions and postures.

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 Titles	Marks Distribution			Total Marks
		R	U	A	
I	English Grammar I	3	3	4	10
II	Passages for Comprehension	2	4	4	10
III	Short Stories	2	4	4	10
iv	Effective Communication	3	3	4	10
v	Non Verbal Communication	3	3	4	10
Total		**13**	**17**	**20**	**50**

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

J) Note: There will be no end semester examination (ESE) for laboratory instructions and the practical activity will be assessed for term work.

K) 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, Facebook, Twitter, Whatsapp, Mobile, Online sources)
8. Brainstorming

L) Suggested Learning Resources:

(a) Books :

1. ***Communication Skills for Technical Students, Book I***; Somaiya Publications Pvt Ltd, Bhopal
2. ***A Course in Technical English, Book II***; Somaiya Publications Pvt Ltd, Bhopal
3. Gopalaswamy 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. Dr.Sumi Guha & Dr.Shameena Bano ***A Study Guide on Communication Skills for Technical Students,*** Vaibhav Prakashan.

(b) Reference Books in Hindi:

1. **वाक् प्रौद्योगिकी के मूलभूत सिद्धांत; *Dr Harshlata Petkar*, Haryana Granth Akadami**
2. **पॉली. कम्युनिकेशन स्किल ; *Sanjeev Khanna*, Shreeram Prakashan**
3. **कम्युनिकेशन इन इंग्लिश ; *Bhadoriya*, *Shah*, Deepak Prakashan**
4. **अ कंप्लीट कोर्स ऑफ कम्युनिकेशन स्किल्स ; *Ravi S Sharma*, Sheel**
5. **कम्युनिकेशन स्किल फॉर टेक्निकल स्टूडेंट्स ; *Dr C S Varde,* University Book House**
6. **कम्युनिकेशन स्किल; *Shammi Bhatnagar, K K Gupta*, Deepak Prakashan**
7. **कम्युनिकेशन स्किल्स I ; *Indian Association of Technical Writers,* Deepak Prakashan**

(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. https://www.britishcouncil.in/english/learn-online
10. http://learnenglish.britishcouncil.org/en/content
11. http://www.talkenglish.com/
12. lhttp://languagelabsystem.com
13. www.wordsworthelt.com

(d) Others:

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

M) 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 Software – ETNL, Biyani, Globarina, A-One Solutions, Wordsworth, Spears	All
3.	**Computer Tables & Chairs**	Depending upon the size of the Language Lab	All
4.	**Smart Board**	As per capacity of the classroom	All
5.	**Projector**	As per capacity of the classroom	All

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
CO1	3	1	2	1	2	-	1	2	3	3		
CO2	3	1	2	1	2	-	1	2	3	3		
CO3	3	2	1	1	2	1	2	3	3	2		
CO4	3	2	1	1	2	1	2	3	3	2		
CO5	3	2	2	2	2	1	2	3	3	3		

Legend:1 – Low, 2 – Medium, 3 – High

O) Course Curriculum Map:

POs	COs No.& Titles	Laboratory Instruction(P)	Classroom Instruction (L)	Self Learning (SL)
PO1,2,3,4,5,7,8,9,10	**CO-1 Use elementary grammar to form correct sentences in communication.**	As mentioned in Col. 2	1.1 1.2 1.3 1.4 1.5	As mentioned in relevant page number
PO1,2,3,4,5,7,8,9,10	**CO-2 Demonstrate LSRW Skills using professional and technical words from the prescribed Passages.**	As mentioned in Col. 2	2.1 2.2 2.3	
PO1,2,3,4,5,6,7,8,9,10	**CO-3 Develop Creative Writing Skills using learnt words from the prescribed stories.**	As mentioned in Col. 2	3.1 3.2 3.3	
PO1,2,3,4,5,6,7,8,9,10	**CO-4 Demonstrate a clear understanding of the principles and models of effective communication in personal, academic and professional contexts**		4.1 4.2 4.3 4.4 4.5	

PO1,2,3,4,5,6,7,8,9,10	**CO-5 Apply appropriate Non-verbal communication skills while communicating with others and use active listening skill as effective tool of interpersonal communication.**		5.1 5.2	

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)
Semester-I

A) Course Code : 2000A03AL037
B) Course Title : Engineering Drawing
C) Pre-requisite Course Code and Title :
D) Rationale :

Engineering Drawing is a language of engineers that enables them to visualize the ideas converting to realization by drawing them. It helps in communicating the shape, size, finish, color and construction of any object and aids in improving the concepts, imagination and visualization power of an engineer. It is a graphical language that communicates all the information about an object from an engineer, who designed it, to an art is an who will make it. This course aims at developing the ability to draw and read various scales, engineering curves, projection of line point and plane, isometric projection and introduces the application of Computer aided drafting software like Auto CAD software for drafting of engineering drawings thereby building the foundation for digital drawing environment for further courses related engineering drawing.

E) Course Outcomes:

CO-1 Use drawing instruments, scales, and standard norms to create drawings.

CO-2 Draw the projection of points, lines and planes with different conditions.

CO-3 Interpret and draw the orthographic and sectional views of an object.

CO-4 Develop isometric view from orthographic views of objects.

CO-5 Use computer aided drafting software to draw 2D geometric entities.

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	Mechanical Engineering	2000A03AL037	Engineering Drawing	2	-	-	2
2	Mechanical Engineering	2000A03AL037	Engineering Drawing (Lab)	-	2	-	1

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

Note: SW& 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	Mechanical Engineering	**2000A04AT037**	Engineering Drawing	100	20	20	-	-	140
2	Mechanical Engineering	**2000A03AL037**	Engineering Drawing (Lab)	-	-	-	40	20	60

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 Use drawing instruments, scales, and standard norms to create drawings.

(Approx. Hrs:L+P+T=08)

Session Outcomes (SOs)	Laboratory Instruction(P)	Classroom Instruction (L)	Self-Learning(SL)
SO1.1 Select and use the drawing instruments. SO1.2 Write an notations in drawing. SO1.3Choose Appropriate line for a given geometrical entity. SO1.4Choose Appropriate scale factor for the drawing as per given situation. SO1.5Choose dimensioning style for a given geometrical entity.	LE 1.1 Draw Lettering, types of lines, methods of dimensioning and one problem from Plain scale & Diagonal scale each on a single drawing sheet.	**Unit-1.0 Basics of Engineering Drawing** 1.1 Importance of engineering drawing. 1.2 Drawing instruments: Use of drawing board, mini drafter, compass, divider, protractor, drawing pencils, setsquares etc., drawing sheets, sheet layout, title block, folding of drawing sheets. 1.3 Lettering and numbering as per BIS 9609, importance, single stroke letters, slanting letters, upper case and lower case letters, general procedure for lettering and numbering, height of letters. 1.4 Lines- Different types of lines. Scales - full scale, reduced scale and enlarged scale. 1.5Dimensioning – terms and notations as per BIS, requirement of dimensioning - Dimension line, Extension lines and Leader lines, Dimensioning systems, Methods of dimensioning, important dimensioning rules.	• Different type of drawing and instruments

Session Outcomes (SOs)	Laboratory Instruction(P)	Classroom Instruction (L)	Self Learning(SL)
SO 1.6 Write Symbols used in Mechanical & Electrical Drawings. SO 1.7 Write Symbols of building elements, materials and sanitary fittings .		1.6 Identification and representation of various symbols used in Mechanical and Electrical Drawings 1.7 Drawing Identification and representation of various symbols of building elements, materials and sanitary fittings	

SW-1 Suggested Sessional Work(SW):

a. Assignments:

i. Draw triangles, without using a protractor, having base angles of 75^{o} and 15^{o} & 105^{o} and 45^{o} on a 75 mm long line as base.
ii. Prepare a neat sketch of 'title block' giving all details in a given drawing sheet.
iii. Write freehand with single stroke, vertical capital letters of 3 mm height.
iv. Sketch the difference between progressive and parallel dimensioning.
v. Draw a simple scale for a given set of data.

Mini Project:

i. Collect production and construction drawings from nearby industries/shop and builders respectively and prepare a list of types of letters, scales and dimensioning used.

CO-2 Draw the projection of points, lines and planes with different conditions.

(Approx.Hrs:L+P+T=12)

Session Outcomes (SOs)	Laboratory Instruction(P)	Classroom Instruction(L)	Self-Learning(SL)
SO2.1 Draw the Projection of points for a given set of conditions. SO2.2 Draw the projection of line for a given set of conditions. SO2.3 Draw the Projection of planes for a given set of conditions.	LE 2.1 Draw the problems on projection of points and lines on a drawing sheet. LE2.2Draw the projection of given Planes on a drawing sheet	**Unit-2.0 Projections of points, lines and planes** 2.1 Projection of points: Concept of quadrant, first angle and third angle projection. Projection of points – points on different quadrants and on the reference planes. 2.2 Projection of straight lines: Projection of straight lines – Line in the first quadrant and on the reference Planes, perpendicular to one plane and parallel to other plane, inclined to one plane and parallel to the other plane, parallel to both the planes and inclined to both the planes. 2.3 Projection of Planes: Concept of planes, a) Projection of planes parallel to one of the reference plane. b) Projection of plane inclined to one reference plane and perpendicular to another. Note: Triangle, Square/ rectangle and circle shape should be included in Various plane problems.	● Projections on auxiliary planes

SW-2 Suggested Sessional Work(SW):

a. Assignments:

i. Draw the projection of points for a given set of conditions.
ii. Draw the projection of lines for a given set of conditions.
iii. Draw the projection of planes for a given set of conditions.

b. Mini Project:

i. Cut triangular, square, rectangular and circular shaped cardboard /thermocol pieces and observe them by placing in different positions as specified in 3.3.
ii. Cut a cardboard/thermocole cone with various section planes to get circle, ellipse, parabola and hyperbola.

c. Other Activities (Specify):

i. Collect production and construction drawings from nearby industries/shop and builders respectively and observe projection of various shaped planes.

CO-3 Interpret and draw the orthographic and sectional views of an object.

(Approx.Hrs:L+P+T=**12**)

Session Outcomes (SOs)	Laboratory Instruction(P)	Classroom Instruction (L)	Self-Learning(SL)
SO3.1 Draw Orthographic views of a given object. SO3.2 Draw Sectional views of a given object.	LE 3.1 Draw the Orthographic projections of a given object with and without section on a drawing sheet. LE 3.2 Draw the projections of a solids and section of given solids on a drawing sheet.	**Unit-3.0. Orthographic projection and Section of solids** 3.1 Introduction, First angle projection, Third angle projection, Symbols and comparison of first and third angle projections. 3.2 Projection of simple objects – front view/ top view/ right/ left side view. 3.3 Concept of sectioning planes, Auxiliary planes, types of sections and true shape of section. 3.4 Projections of Solids: Types of solids, projections of solids in simple position, 3.5 Section of solids, Practice problems for Drawing projections and section of solids. like Prism & Pyramids	• View video programmes related to orthographic projection.

SW-4 Suggested Sessional Work (SW) :

a. Assignments:

i. Draw minimum three drawing sheets on orthographic views of simple machine parts.

ii. Draw minimum three drawing sheets on sectional views of objects.

b. Mini Project

i. Visit your institute's workshop and draw top, front and side views of single point cutting tool.

ii. Take a medium sized hexagonal nut and draw its top and front view.

c. Other Activities (Specify):

i. Collect production and construction drawings from nearby industries/shop and builders respectively and observe the type of orthographic projection, symbol of projection and various views used.

CO-4 Develop isometric view from orthographic views of objects.

(Approx.Hrs:L+P+T)= 12)

Session Outcomes (SOs)	Laboratory Instruction (P)	Classroom Instruction(L)	Self-Learning (SL)
SO4.1SO5.1Draw Isometric view from orthographic views of given objects	LE 4.1 Draw isometric views of simple machine elements	**Unit-4.0 Isometric Projection** 4.1 Isometric axis, lines, and planes, isometric scale, isometric projection, isometric drawing. 4.2 Isometric projection of Simple objects containing rectangular, circular, cylindrical shapes.	● View video programmes related to this outcome.

SW-4 Suggested Sessional Work (SW):

a. Assignments:

i. Draw minimum two sheets on isometric views.

b. Mini Project:

i. Take a medium sized hexagonal nut and draw its isometric projection

c. Other Activities (Specify):

i. Collect production and construction drawings/photographs in which isometric, oblique and perspective projections are used.

CO-5 Use Computer aided Drafting software like Auto CAD to draw 2D geometric entities.

(Approx.Hrs:L+P+T= 16)

Session Outcomes (SOs)	Laboratory Instruction(P)	Classroom Instruction(L)	Self-Learning (SL)
SO5.1Usecomputer aided drafting software like Auto CAD **for** creating simple drawings.	LE5.1 Drawminimum two drawings using Auto CAD software.	**Unit-5.0 Computer aided Drafting** 5.1 Basics of AutoCAD, AutoCAD interface, screen layout, starting commands from menus, Coordinate system, Angular measurements, Point specification, Drawing aids - Grid, Snap, Ortho, Osnap, Units, Limits, Layers, Linetype. 5.2 Creating basic 2D drawings Drawing objects - lines, arc, circles, ellipses, polyline and polygons. 5.3 Modify commands - erase, copy, move, rotate, scale, stretch, array. 5.4 Printing and plotting of drawings.	● View video programmes related to Auto Cad to draw 2D geometric entities.

SW-5 Suggested Sessional Work (SW):

a. Assignments:

i. Draw minimum five drawings using AutoCAD software.

b. Mini Project:

i. Prepare an A4 template of your institute with title block and institute logo.

ii. Prepare a circular array using array command.

c. Other Activities (Specify):

i. Collect at least two AutoCAD tutorial videos from web and submit them to your teacher.

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

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

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	Basics of Engineering Drawing	4	6	10	20
II	Projections of point, line and planes	4	9	12	25
III	Orthographic Projection and Section of solids	4	9	12	25
IV	Isometric Projection	2	4	9	15
V	Computer aided Drafting	2	4	9	15
Total		**16**	**32**	**52**	**100**

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

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

Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)			Marks are allocated for performance under ESE based on following performance parameters:
		Performance		Viva-Voce	
		PRA	PDA		
LE1.1	Draw Lettering, types of lines, methods of dimensioning and one problem from Plain scale & Diagonal scale each on a single Drawing sheet.	25	15	10	• Submission of drawings as per schedule • Neatness, Cleanliness on all prepared drawing sheets • Uniformity in drawing and line work • Dimensioning the given drawing and writing text • Visualization and drawing ability
LE2.1	Draw the problems on projection of points And lines on a drawing sheet.	25	15	10	
LE2.2	Draw the projection of given Planes on a drawing sheet.	25	15	10	
LE3.1	Draw the Orthographic projections of a given Simple object with and without section on a drawing sheet.	25	15	10	
LE3.2	Draw the projections of a solids and section of given Simple solids on a drawing sheet.	25	15	10	
LE4.1	Draw isometric views of simple machine elements.	25	15	10	
LE5.1	Draw minimum two 2D drawings using AutoCAD software.	25	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/practicals,

Legend: PRA: Process Assessment, PDA: Product Assessment

Note: Only one experiment has to be performed at the end semester examination of **30 Marks** as per assessment scheme

F) Suggested Instructional/ Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Industrial visits
4. Industrial Training
5. Field Trips
6. Portfolio Based Learning
7. Demonstration
8. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)

G) Suggested Learning Resources:

(a) Books:

S.No.	Titles	Author	Publisher and Edition*
1	Engineering Drawing	N.D. Bhatt	Charotar Publisher
2	Engineering Drawing	R.B. Gupta	Satya Prakashan
3	Engineering Drawing	Gujral &Shende	Khanna Publisher
4	Engineering Drawing	R.K. Dhawan	S.Chand
5	Engineering Drawing	P.J. Shah	S.Chand
6	Engineering Drawing	M.B. Shah, B.C. Rana	Pearsons
7	Engineering Graphics with AutoCAD	A.K. Sarkar, A.P. Rastogi, D.M. Kulkarni	PHI
8	Engineering Drawing and Graphics using AutoCAD	T.Jeyapoovan	Vikas
9.	इंजीनियरिंग ग्राफ़िक्स	शरद कुमार प्रधान, के के जैन	Khanna Publishers
10.	इंजीनियरिंग ड्राइंग	योगेंद्र वार्ष्णेय	Deepak Prakashan

*Latest edition of all above books should be referred

(b) Open source software and website address:

1. Introduction : https://www.youtube.com/watch?v=z4xZmBpXIzQ
2. dimensioning system: https://www.youtube.com/watch?v=OF3S6BjMKsI
3. Basic of engineering drawing :https://www.youtube.com/watch?v=FEju-hA5Peo
4. Engineering scales :https://www.youtube.com/watch?v=n9iQcttWHAo
5. Engineering curves : https://www.youtube.com/watch?v=8sZkhL64-Qw&list=PLeFT-Ztj-s49OnKf3zO10MhVBH16GvZLn
6. Conicsection : https://www.youtube.com/watch?v=1AMyZ-WzPB0
7. 1st and 3rd angle projection:https://www.youtube.com/watch?v=mcxUTNkSyp4
8. Orthographic projection: https://www.youtube.com/watch?v=nDmwL1IWoIc
9. Projection of point: https://www.youtube.com/watch?v=Wy10RORC0s8
10. Projection of line: https://www.youtube.com/watch?v=UewSQ061MzM
11. Projection of plane: https://www.youtube.com/watch?v=KWuW5VZf9a0

12. Basic of isometric projection: https://www.youtube.com/watch?v=p7Tz17Af-zE
13. Isometric projection: https://www.youtube.com/watch?v=k2frX4CXJ_Y
14. Auto cad : https://www.youtube.com/results?search_query=autocad+for+beginners+in+hindi+
15. Auto cad : https://www.youtube.com/watch?v=ohjh0JjQHnY
16. Auto cad: https://www.youtube.com/watch?v=ZugYdLxsg0E
17. Nptel reference: http://nptel.ac.in/courses/112103019/15

(c) Others:

1. Learning Packages.
2. Manufacturers' Manual

H) List of Major Classroom Instruction Aid Equipment's and Tools:

S.No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1	Computer aided drafting software like AutoCAD	Latest educational licensed network version	LE5.1
2	CAD workstations	latest configuration	LE5.1
3	Drawing boards	A1size	LE1.1,LE2.1,LE3.1,LE3.2, LE4.1,LE4.2,LE5.1
4	Interactive board (165 x 130 cm)	Supports dual touch, dual write and intuitive gestures, such as toss, rotate and zoom, available with multi touch operating systems, such as Windows®	All
5	Printer/plotter	A3size	LE5.1
6	Models for projection and demonstration	Wooden models	LE2.1,LE3.1,LE3.2,LE4.1, LE4.2, LE5.1

I) Mapping of POs &

J) PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)		
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 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	PSO-3
CO-1Usedrawing instruments, scales, and standard norms to create drawings.	3	3	2	3	1	1	1	1	1	3	-	-	-
CO-2 Draw the projection of points, lines and planes with different conditions.	2	2	2	2	1	1	1	1	3	3	-	-	--
CO-3 Interpret and draw the orthographic &sectional views of an object.	2	3	2	2	1	1	1	1	3	3	-	-	-
CO-4 Develop isometric view from orthographic views of objects.	3	3	3	2	1	1	2	1	3	3	-	-	-
CO-5 Use computer aided drafting software like Auto CAD to draw 2D geometric entities.	3	3	3	2	1	1	2	1	3	3	3	-	-

Legend:1–Low,2–Medium,3–High

K) Course Curriculum Map:

POs &PSOs No.	COs No. &Titles	SOs No.	Laboratory Instruction (P)	Classroom Instruction (L)	Self Learning (SL)
PO-1,2,3,4,5,6, 7,8,9,10	CO-1 Use drawing instruments, scales, and standard norms to create drawings.	SO1.1 SO1.2 SO1.3 SO1.4 SO1.5	LE1.1	Unit-1.0BasicsofEngineering Drawing 1.1,1.2,1.3,1.4, 1.5	As mentioned in relevant pages
PO-1,2,3,4,5,6, 7,8,9,10	CO-2 Draw the projection of points, lines and planes with different conditions.	SO.2.1 SO2.2 SO3.3	LE2.1, LE2.2	Unit-2.0 Projection of points, lines and planes 2.1,2.2,2.3	
PO-1,2,3,4,5,6, 7,8,9,10	CO-3 Interpret and draw the orthographic and sectional views of an object	SO3.1 SO3.2 SO3.3	LE3.1, LE3.2	Unit-3.0 Orthographic projection and Section of solids 3.1,3.2	
PO-1,2,3,4,5,6, 7,8,9,10	CO-4 Develop isometric view from orthographic views of objects.	SO4.1 SO4.2	LE4.1	Unit-4.0Isometric Projection 4.1,4.2	
PO-1,2,3,4,5,6, 7,8,9,10	CO-5 Use computer aided Drafting software like Auto CAD to draw 2D geometric entities.	SO5.1 SO5.2 SO5.3 SO5.4	LE5.1	Unit-5.0 Computer aided Drafting	

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma Engineering Common to all Branches

Semester-I

A) Course Code : 2000A06FT033

B) Course Title : Cyber Threats and Awareness

C) Pre- requisite Course Code and Title :

D) Rationale: In today's digital era, the rapid growth of online services has also led to a significant rise in cyber threats, scams, and frauds. Lack of awareness makes individuals and organizations vulnerable to identity theft, financial loss, and misuse of personal information. This basic course on *Cyber Threats and Awareness* aims to educate students about common cyber risks, preventive measures, and safe online practices. By promoting digital vigilance, the course empowers learners to protect themselves and their data in the ever-evolving cyber space.

E) Course Outcomes :

CO-1 Introduce basic cyber security concepts and common digital threats.

CO-2 To teach safe practices for using the internet, devices, and social media.

CO-3 To help identify and avoid common online scams and financial frauds.

CO-4 To create awareness about basic cyber laws and promote ethical online behaviour.

CO-5 To encourage good cyber habits and participation in awareness initiatives.

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	Information Technology	2000A06FT033	Cyber Threats and Awareness	1	-	-	1

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	Information Technology	2000A06FT033	Cyber Threats and Awareness	50	10	10	-	-	70

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:

Unit 1: Introduction to Cyber Security and Threats (7 Hours)

Basics of cyber security and its relevance in everyday digital life. Common cyber threats: malware, phishing, ransomware, and hacking. Overview of cybercrime vs cyberattacks. Real-life examples of data breaches. Importance of awareness and alertness. Basic cyber safety tips.

Unit 2: Safe Use of Internet and Devices (7 Hours)

Safe internet practices: strong passwords, two-factor authentication, avoiding suspicious links. Concept of secure browsing (HTTPS). Essential mobile/computer safety: antivirus, updates, app permissions, and locking devices. Social media safety and avoiding public Wi-Fi.

Unit 3: Online Scams and Frauds (7 Hours)

Introduction to Online Scams and Cyber Frauds, Types of Common Online Scams, Tricks used by fraudsters, Identify and Avoid Online Scams**.**

Unit 4: Cyber Laws and Ethics (7 Hours)

Overview of Indian Cyber Laws (IT Act 2000). Offences like cyberbullying, identity theft, data breaches. Importance of ethical online behavior, privacy, and digital footprints.

Unit 5: Cyber Hygiene and Awareness Programs (7 Hours)

Good cyber habits: regular updates, virus scanning, data backup, link safety. Concept of digital cleanliness. Cyber Swachhta Kendra, and Cyber Surakshit Bharat. Promoting cyber safety among peers and families.

I) Course Outcomes

1. **Understand the basics of cyber security and common cyber threats.**
2. **Apply safe practices for internet and device usage.**
3. **Identify and avoid online scams and frauds.**
4. **Follow cyber laws and demonstrate ethical online behavior.**
5. **Maintain cyber hygiene and promote cyber safety awareness.**

Textbook:

1. **Cyber Security Essentials** – Rajesh Kumar *Publisher: Wiley India*
2. **Cyber Security Essentials**–James Graham, Richard Howard, Ryan Olson, CRC Press
3. **Fundamentals of Cyber Security**–Bhushan Trivedi *Publisher,* Oxford University Press

Reference Books:

1. **Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives** – Nina Godbole, Sunit Belapure, *Publisher: Wiley India*
2. **Computer Security: Principles and Practice**– William Stallings and Lawrie Brown *Publisher:* Pearson Education

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma in Engineering (common to all branch)
Semester-I

A) Course Code : **2000A01AL037**

B) Course Title : **Engineering Workshop Lab**

C) Rationale: Mechanical Workshop practice is an essential requirement to understand the working and execution of jobs in industrial environment. This course intends to impart basic know-how of various tools, methods and their use at different stages of manufacturing. This course will develop skills in handling tools, instruments, equipments used in the workshop and perform operations in various shops and enhance relevant technical skills required to work in an industry along with the understanding of the complexity of the industrial job.

D) Course Outcomes:

CO-1 Use measuring devices and hand tools effectively.
CO-2 Perform wood working and pattern making operations economically and safely.
CO-3 Perform various joining operations using welding, brazing and soldering methods.
CO-4 Perform different types of fitting, plumbing and sheet metal operations.
CO-5 Prepare simple jobs using lathe and drilling machine.
CO-6 Perform different types of smithy operations
CO-7 Prepare a green sand mould and cast a product.

E) Scheme of Studies:

S.N.	Board of study	Course code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Total Credits (C)
1.	Mechanical Engineering	2000A01AL037	Engineering Workshop	-	4	-	2

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

F) Scheme of Assessment:

S.N.	Board of study	Course code	Course Title	Scheme of Assessment (LAB)			
				ESE	CT	TA	Total Marks
1.	Mechanical Engineering	2000A01AL037	Engineering Workshop	40	-	20	60

G) 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 Use measuring devices and hand tools effectively.

(Approx. Hrs: L+P+T = 10)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO1.1 Identify various measuring tools and instrument. SO1.2 Describe measuring units and its conversion. SO1.3 Select suitable measuring devices in a given situation. SO1.4 Identify workshop hand tools. SO1.5 Describe Safety procedure in different workshops.	LE1.1 Identify different type of measuring tools available in workshop. LE1.2 Use suitable Marking and hand tools in a given situation. . LE1.3 Perform mock drill session in group of minimum 15 students for extinguishing fire.	**Unit- 1.0 Measurement, Types of Hand tools and workshop safety.** 1.1 Engineering Measurement: definition, importance and Types of measurements. 1.2 Measuring instruments: linear measurement and angular measurement instruments. 1.3 Measuring devices: Linear measurement and angular measurement devices. 1.4 Workshop hand tools: List the various hand tools used in workshops. 1.5 Workshop Safety –Hazards, Safety Practices, Causes of accidents, General safety rules, Safety signs and symbols. Firefighting equipment, fire extinguishers, and their types and First Aid	· Collect the information related to various hand tools listed.

SW-1 Suggested Sessional Work (SW):

Assignments: Select any engineering object / part / drawing and perform the measurement using suitable measuring device.

Mini Project: Visit nearby mechanical workshop and collect information about operation performed and prepare the list of tools and equipment along with specification.

CO-2 Perform wood working and pattern making operations economically and safely.

(Approx. Hrs: L+P+T = 10)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO2.1 Identify various wood working tools with major specifications. SO2.2 Select wood working tools as per given job. SO2.3 Demonstrate various wood working operations. SO2.4 Explain procedure to prepare given type of joint. SO2.5 Explain procedure to prepare given type of pattern.	LE2.1 Prepare one simple job of wood working comprising of marking, cutting, plaining and finishing as per given drawing/sketch. LE2.2 Prepare any two wooden joints safely as per given drawing. LE2.3 Prepare a job using Wood Turning Lathe machine. LE2.4 Prepare any two types of patterns as per drawing.	**Unit- 2.0 Wood Working and Pattern making** 2.1 Types of woods and artificial woods and their applications. 2.2 wood working tools –bench vice, hammers, chisel, files, hacksaw, wood saw, surface planer, punch, v block, try square , steel rule , twist drill, marking block, reamers, tap set, mallet and their Specification. 2.3 Wood working operations – Marking ,Cutting , reaming , filing, drilling, joining, 2.4 Types of wood working joint – Butt joint , lap joint, Bridle joint , Dowel joint, Mitre joint , finger joint , dovetail joint , Dado joint, Groove joint, Cross lap, splice joint. 2.5 Wood Turning Lathe Machine, various types of curving chisels used in wood turning lathe. 2.6 Pattern: single piece, split pattern, loose piece etc.	Collect the information on various types and appearance of wood being used in packaging of industrial products using internet facility.

SW-2 Suggested Sessional Work (SW):

Assignments: Select (Minimum 3 finished jobs) different wood working / carpentry jobs and prepare list of different types of woods and joints used in selected objects.

Mini Project: Make a wooden job as per given drawing and specifications of material

CO-3 Perform various joining operations using welding, brazing and soldering methods.

(Approx. Hrs: L+P+T =10)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO3.1 Identify different types of welding machine, tools and personal protective equipments. SO3.2 Select suitable welding method as per job requirement. SO3.3 Explain arc welding and gas welding procedure. SO3.4 Explain soldering and Brazing process.	LE3.1 Operate gas welding apparatus to generate different types of flames. LE3.2 Prepare lap joint using gas welding as per given drawing safely. LE3.3 Prepare butt joint using arc welding as per given drawing safely. LE3.4 Join the given aluminum sheet by using brazing	**Unit- 3.0 Joining Methods** 3.1 Joining methods- Various types of Joining Methods and their field of applications and types of welding joint. 3.2 Arc welding: Arc welding process, equipment with necessary accessories, Welding electrode, tools and consumables 3.3 Personal protective equipment like safety glasses, welding gloves etc and safe practices in welding shop. 3.4 Gas welding: Gas welding process, Equipment with necessary accessories, Types like Carburizing, oxidizing and neutral flame. 3.5 Soldering and brazing: specification, filler material, flux, heating methods, temperature range, advantages, and comparison.	Collect the information on various types of welding electrodes and their industrial applications.

SW-3 Suggested Sessional Work (SW):

Assignments: Select any two joining method and write their engineering field of application.

Mini Project: Prepare any utility job like lab stool structure by using suitable welding process with list of tools and equipment along with specifications.

CO-4 Perform different type of fitting, plumbing and sheet metal operation.

(Approx. Hrs: L+P+T =10)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO4.1 Identify various tools used in fitting, plumbing and sheet metal shop. SO4.2 Select relevant tools as per given job in fitting, plumbing and sheet metal shop. SO4.3 Perform various fitting operations. SO4.4 Perform various sheet metal operations. SO4.5 Perform various plumbing operations.	LE4.1 Prepare one simple Job of fitting shop as per given drawing and instruction. LE4.2 Prepare one male – female type Fitting Job as per given Drawing. LE4.3 Prepare one sheet metal job using cutting, bending, edging and joining operations as per given drawing. LE4.4 Prepare an elbow joint and T joint in plumbing shop as per drawing.	**Unit- 4.0 Fitting, Plumbing and Sheet metal Shop**. 4.1 Fitting tools – Hand tools used in fitting shop, holding tools, Marking and measuring tools, cutting tools. 4.2 Fitting Operation –Sawing, Chipping, Filling, Taping, Reaming and Drilling. 4.3 Sheet metal tools-Types of sheet metal tools. 4.4 Sheet metal operation- Shearing, Bending, Drawing, Hemming Squeezing, Snipping, riveting, Grooving. 4.5 Plumbing- types of pipe, types of pipe joint, plumbing hand tools, pipe vice, pipe bending tools, pipe wrenches, dies. 4.6 Pipe fitting- bends, elbows, tees, cross, coupler, socket, reducer, cap, plug, nipple.	Using internet facility and collect the information related to field applications of sheet metal.

SW-4 Suggested Sessional Work (SW):

Assignments: Collect the information from nearby sheet metal shop regarding manufacturing of cooler, trunk etc.

Mini Project: Prepare file stand by using by suitable material and sheet metal operation.

CO-5 Prepare jobs using lathe and drilling machine.

(Approx. Hrs: L+P+T = 10)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO5.1 Explain various components of lathe machine. SO5.2 Describe job and tool holding devices. SO5.3Calculate speed, feed, depth of cut of lathe machine. SO5.4 Perform simple lathe operations. SO5.5 Perform Drilling, reaming and boring operation.	LE5.1 Prepare one simple turning job as per given drawing. LE5.2 Perform step turning, threading operation to prepare job as per given drawing. LE5.3 Perform drilling, reaming and boring operation on pillar drill machine as per drawing.	**Unit- 5.0 Lathe Machine and Drilling machine** 5.1 Concept, Working principle, constructional details and major components of lathe machine with their functions. 5.2 Job and tool holding devices and lathe attachment – head stock, tail stock, tool post, Lathe tools, chucks(3 and 4 Jaw), name and advantages of lathe attachment. 5.3 Lathe operations – Plain turning, Facing, taper turning, Knurling, stepturning Threading etc. 5.4 Drilling machine- classification, specification, constructional features. 5.5 Drilling machine operations- Drilling, reaming, boring, counter sinking, counter boring.	Collect data on various applications of lathe machine for engineering applications.

SW-5 Suggested Sessional Work (SW):

Assignments: . Visit the institute workshop and prepare a report comprises of names of different machine tools / tools their specifications and manufacturer's name.

Mini Project: Visit the nearby workshop /machine shop and prepare the field report comprises of the following

a. Product(s) name
b. List of machine tools with associated accessories,
c. List of lathe tools with relevant accessories
d. List major clients.

CO-6 Perform different types of smithy operations.

(Approx. Hrs: L+P+T = 10)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO6.1 Identify various holding, striking, cutting, forming tools used in smithy shop. SO6.2 Perform various forming operations as per drawing.	LE6.1 Perform Upsetting, drawing out, fullering, Bending operation. LE6.2 Perform forge welding operation.	**Unit 6 Smithy shop** 6.1 Safety measures, Heating and fuel handling tools: black smith forges blower, shovel, and poker. 6.2 Holding and supporting tools: tongs, anvil, swage block. 6.3 Striking tools: Ball peen, cross peen, straight peen, sledge hammer. 6.4 Cutting tools: Hot and cold chisel, shear set. 6.5 Punching, Bending and forming tools. 6.6 Forging operations: upsetting, drawing out, fullering, swaging, bending, punching, bending, forge welding.	Collect the information about power press used in forging.

SW-6 Suggested Sessional Work (SW):

Assignments: Identify various house hold tools and articles made from smithy operations.

Mini Project: Prepare a fan hook from given mild steel piece.

CO-7 Prepare a green sand mould and cast a product.

(Approx. Hrs: L+P+T = 08)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self-Learning (SL)
SO7.1 Identify various tools used in foundry shop. SO7.2 Explain the properties of moulding sand. SO7.3 Explain the purpose of core, riser and gate. SO7.4 Identify Casting defects and explain their causes.	LE7.1 Prepare green sand for making a mould. LE7.2 Prepare a green sand mould using single piece pattern. LE7.3 Prepare a green sand mould using split pattern. LE7.4 Prepare a non ferrous casting product using previously prepared mould.	**Unit 7 Foundry shop** 7.1 Safety measures, foundry tools, handling of molten metal. 7.2 Pattern allowances, color code. 7.3 Moulding sand: properties, types, binders, additives, mixing. 7.4Types of mould, mould making. 7.5 Metal and non metals. 7.6 Melting of metals: pit furnace, cupola furnace. 7.7 pouring of metals: gate, riser. 7.8 Casting and casting defects.	Collect the information about various casting process.

SW-7 Suggested Sessional Work (SW):

Assignments: Identify various house hold tools and articles made from casting process.

Mini Project: prepare a simple casting product.

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

Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
		Performance		Viva voice
		PRA	PDA	
LE1.1	Identify different types of Measuring tools available in workshop.	50	25	25
LE1.2	Measuring and Marking in a given situation.	40	40	20
LE1.3	Mock drill session for extinguishing fire.	40	40	20
LE2.1	Preparation of two wooden joints.	50	30	20
LE2.2	Prepare a job using wood turning machine.	50	30	20
LE2.3	Prepare a split pattern as per drawing.	50	30	20
LE3.1	Preparation of lap joint using gas welding.	50	30	20
LE3.2	Preparation of butt joint using arc welding.	50	30	20
LE3.3	Joining of aluminum sheet by using brazing.	50	30	20
LE4.1	Preparation of simple fitting job.	50	30	20
LE4.2	Preparation of 'T' fit or 'V' fit job.	50	30	20
LE4.3	Preparation of sheet metal job.	50	30	20
LE4.4	Preparation of pipe joints.	50	30	20
LE5.1	Perform turning, facing and taper turning operation on lathe machine.	50	30	20
LE5.2	Perform step turning and thread cutting operation on lathe machine.	50	30	20
LE5.3	Perform drilling, boring and reaming operation on pillar drill machine.	50	30	20
LE6.1	Preparation of a simple job in smithy shop.	50	30	20
LE6.2	Perform forged welding operation in smithy shop.	50	30	20
LE7.1	Prepare a green sand mould using single piece pattern.	40	40	20
LE7.2	Prepare a green sand mould using split pattern.	40	40	20
LE7.3	Prepare a non ferrous casting product using previously prepared mould.	50	30	20

PRA: Process Assessment**, PDA**: Product Assessment

Note: Only one experiment has to be performed at the end semester examination of 50 Marks as per assessment scheme.

I) 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. Real Model
10. Charts
11. Demonstration
12. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile) can be integrated with many method.

J) Suggested Learning Resources:

(a) Books :

S. No.	Titles	Author	Publisher	Edition & Year
1	Workshop Practice	Bawa, H.S.	McGraw Hill Education, Noida; ISBN: 978-0070671195	Latest
2	A Textbook of Manufacturing Process (Workshop Tech.)	Gupta, J.K.; Khurmi, R.S.	S.Chand and Co. New Delhi ISBN:81-219-3092-8	Latest
3	Introduction to Basic Manufacturing Process & Workshop Technology	Singh, Rajender	New Age International, New Delhi; 2014, ISBN: 978-81-224-3070-7	Latest
4	Elements of Workshop Technology	Hajra; Choudhary;	Media Promoters and Publishers Mumbai, 2009, ISBN: 10-8185099146	Latest
5	प्रारम्भिक कार्यशाला तकनीकी	K.K. Gupta	Asian publishers	Latest
6	वर्कशॉप टेक्नोलॉजी	शिवदत्त उपाध्याय	स्टैंडर्ड पब्लिशर्स	
7	इंजीनियरिंग वर्कशॉप प्रैक्टिस (प्रैक्टिकल)	अजय कुमार सरथे	खन्ना पब्लिशर्स	
8	वर्कशॉप / मैन्युफैक्चरिंग प्रैक्टिसेज (प्रैक्टिकल)	वी. डी. कैंचक्कनावर	खन्ना पब्लिशर्स	

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

1. Measuring device : https://www.youtube.com/watch?v=3M4rsWBYaIA
2. Precision measuring device : https://www.youtube.com/watch?v=JX8gHdNpamk
3. Angular measuring device : https://www.youtube.com/watch?v=dgkLbX4cqr4
4. Workshop hand tools: https://www.youtube.com/watch?v=4o0tqF0jDdo
5. Woodworking joint:https://www.youtube.com/watch?v=UDQ_aS8qvaU
6. Woodworkingtools:https://www.youtube.com/watch?v=aCe9dNzCVQU
7. Joining method : https://www.youtube.com/watch?v=rFKtP_6w4B0
8. Arc welding: https://www.youtube.com/watch?v=ZQ7vdwjmX80
9. Gas welding process: https://www.youtube.com/results?search_query=gas+welding+process+animation
10. Types of flame: https://www.youtube.com/watch?v=1OLppHw6GRE
11. Types of welding process: https://www.youtube.com/watch?v=CCzhT81GrBo
12. Soldering and brazing : https://www.youtube.com/watch?v=BplzRtQAMw0

13. Welding safety equipment : https://www.youtube.com/watch?v=S1H_mV3Webo
14. Fitting shop : https://www.youtube.com/watch?v=dVxjT5kkhFc
15. Sheet metal operation : https://www.youtube.com/watch?v=95rgHM58dgw
16. Drilling operation : https://www.youtube.com/watch?v=zf9rgvzjkpY
17. Shearing operation : https://www.youtube.com/watch?v=VMu7_W0QE3Y
18. Drawing operation : https://www.youtube.com/watch?v=MQwHMebFuZM
19. Lathe component: https://www.youtube.com/watch?v=YQznrRi3heQ
20. Lathe Machine operation : https://www.youtube.com/watch?v=OgqsjZJwce8
21. Work holding devices : https://www.youtube.com/watch?v=jP1-IzLtXRw
22. Working principle of lathe : https://www.youtube.com/watch?v=NgbbB1tdmo4
23. sand moulding : https://youtu.be/mS-YwaGgNqw?si=a4h3LY3eXlHXVQbS
24. sand casting: https://youtu.be/EIBDp6U8bHo?si=Lym5MvH5OIWsP5Eb

(c) Others:

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)
Semester-I

A) Course Code : 2000A05FL046
B) Course Title : Yoga and Meditation
C) Pre- requisite Course Code and Title :
D) Rationale :

E) This course aims to promote holistic well-being by introducing participants to the ancient practices of yoga and meditation. Through simple postures, breathing techniques, and mindfulness exercises, learners will enhance physical health, mental clarity, and emotional balance. It encourages the adoption of sustainable daily wellness habits for a healthier and more focused lifestyle.

F) Course Outcomes: Students will be able to:

1. **Understand the fundamentals of yoga and meditation.**
2. **Learn basic yoga postures for flexibility, balance, and strength.**
3. **Practice breathing techniques (Pranayama) for mental calmness.**
4. **Experience guided meditation for stress relief and focus.**
5. **Build a personal routine for physical and mental well-being.**

G) Scheme of Studies:

Teaching Hrs: 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	2000A05FL046	Yoga and Meditation	-	-		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.

H) 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	2000A05FL046	Yoga and Meditation	-	-	20	-	-	-	-	20

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

I) Course-Curriculum Detailing:

Yoga

Yoga is an ancient discipline that harmonizes the body, mind, and spirit through physical postures (asanas), breathing techniques (pranayama), and relaxation practices. This course introduces learners to the basic principles of yoga, its health benefits, and simple yet effective postures for improving flexibility, strength, and balance. Sessions include warm-up exercises, foundational asanas, and cool-down stretches designed for beginners as well as those with prior experience. Emphasis is placed on correct posture, breath control, and mindful movement to promote physical well-being and inner calm.

Meditation

Meditation is the practice of focused awareness that helps calm the mind, reduce stress, and improve concentration. In this course, participants will explore various beginner-friendly meditation techniques such as breath awareness, mantra chanting, and guided visualization. The sessions aim to cultivate mindfulness, emotional balance, and mental clarity. Learners will be encouraged to integrate short meditation practices into their daily routines to experience its long-term benefits, such as enhanced focus, better stress management, and a deeper sense of peace.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Diploma (Common to All Branches)

Semester-I

A) Course Code : 2000A07FT020

B) Course Title : Civil Engg- Societal and Global Impact

C) Pre- requisite Course Code and Title :

D) **Course Objective**: The course is designed to provide a better understanding of the impact which Civil Engineer- ing has on the Society at large and on the global arena. Civil Engineering projects have an impact on the Infrastructure, Energy consumption and generation, Sustainability of the Envi- ronment, Aesthetics of the environment, Employment creation, Contribution to the GDP, and on a more perceptible level, the Quality of Life. It is important for the civil engineers to realise the impact which this field has and take appropriate precautions to ensure that the impact is not adverse but beneficial.

E) Course Outcomes :

CO-1 Describe about recent civil engineering breakthroughs & innovates

CO-2 Explain the awareness of various codes & standards governing infrastructure development

CO-3 Describe about environmental metrics & monitoring

CO-4 Explain the sustainability of structure and environment

CO-5 Explain the innovations and methodologies for ensuring sustainability during project development

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 Engg	2000A07FT020	Civil Engg- Societal and Global Impact	1	-	-	1

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 Engg	2000A07FT020	Civil Engg- Societal and Global Impact	-	-	40	-	-	40

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:

UNIT I **L-6**

INTRODUCTION TO COURSE AND OVERVIEW; Understanding the past to look into the future: Preindustrial revolution days, Agricultural revolution, first and second industrial revolutions, IT revolution; Recent major Civil Engineering breakthroughs and innovations; Present day world and future projections, Ecosystems in Society and in Nature; the steady erosion in Sustainability; Global warming, its impact and possible causes; Evaluating future requirements for various resources; GIS and applications for monitoring systems; Human Development Index and Ecological Footprint of India Vs other countries and analysis; Understanding the importance of Civil Engineering in shaping and impacting the world; The ancient and modern Marvels and Wonders in the field of Civil Engineering; Future Vision for Civil Engineering.

UNIT II **L-6**

INFRASTRUCTURE - HABITATS, MEGACITIES, SMART CITIES, FUTURISTIC VISIONS;
Transportation(Roads, Railways & Metros, Airports, Seaports, River ways, Sea canals, Tunnels (below ground, under water); Futuristic systems (ex, Hyper Loop)); Energy generation (Hydro, Solar (Photovoltaic, Solar Chimney), Wind, Wave, Tidal, Geothermal, Thermal energy); Water provisioning; Telecommunication needs (towers, above-ground and underground cabling); Awareness of various Codes & Standards governing Infrastructure development; Innovations and methodologies for ensuring Sustainability;

UNIT III **L-6**

ENVIRONMENT-TRADITIONAL & FUTURISTIC METHODS; Solid waste management, Water purification, Wastewater treatment & Recycling, Hazardous waste treatment; Flood control (Dams, Canals, River interlinking), Multi-purpose water projects, Atmospheric pollution; Global warming phenomena and Pollution Mitigation measures, Stationarity and non -stationarity; Environmental Metrics & Monitoring; Other Sustainability measures; Innovations and methodologies for ensuring

Sustainability.

UNIT IV **L-6**

BUILT ENVIRONMENT–FACILITIES MANAGEMENT, CLIMATE CONTROL; Energy efficient built environments and LEED ratings, Recycling, Temperature/ Sound control in built environment, Security systems; Intelligent/ Smart Buildings; Aesthetics of built environment, Role of Urban Arts Commis- sions; Conservation, Repairs & Rehabilitation of Structures & Heritage structures; Innovations and methodologies for ensuring Sustainability

UNIT V **L-6**

CIVIL ENGINEERING PROJECTS – ENVIRONMENTAL IMPACT ANALYSIS PROCEDURES; Waste (materials, manpower, equipment) avoidance/ Efficiency increase; Advanced construction techniques for better sustainability; Techniques for reduction of Green House Gas emissions in various aspects of Civil Engineering Projects; New Project Management paradigms & Systems (Ex. Lean Construc- tion), contribution of Civil Engineering to GDP, Contribution to employment(projects, facilities management), Quality of products, Health & Safety aspects for stakeholders; Innovations and method- ologies for ensuring Sustainability during Project development.

TEXT BOOKS:

1. Resilient Society. Geotechnical, Geological and Earthquake Engineering, Vol. 32. Springer, Dordrecht
2. Brito, Ciampi, Vasconcelos, Amarol, Barros (2013) Engineering impacting Social, Economical and Working Environment, 120th ASEE Annual Conference and Exposition

REFERENCES:

1. Ziga Turk (2014), Global Challenges and the Role of Civil Engineering, Chapter 3 in: Fischinger M. (eds) Performance-Based Seismic Engineering: Vision for an Earthquake
2. NAE Grand Challenges for Engineering (2006), Engineering for the Developing World, The Bridge, Vol 34, No.2, Summer 2004.
3. Allen M. (2008) Cleansing the city. Ohio University Press. Athens Ohio.