Shri Rawatpura Sarkar University, Raipur
Faculty of Engineering
Three Year Diploma Programme
DIPLOMA IN ENGINEERING, SECOND SEMESTER SCHEME
(COMMON TO ALL BRANCHES OF ENGINEERING)
Outcomes Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2022-2023)

S.N	Course Code	Course Title	L	T	P	Credits	Continuous Evaluation	End Sem Exam	Total	ESE Duration (Hrs)
1	DP201T	Applied Mathematics-II	2	1	-	3	30	70	100	3
2	DP202T	Engineering Mechanics	2	1	-	3	30	70	100	3
3	DP202P	Engineering Mechanics	-	-	2	1	15	35	50	-
4	DP203T	Fundamental of Computer Application	2	1	-	3	30	70	100	3
5	DP203P	Fundamental of Computer Application	-	-	2	1	15	35	50	-
6	DP204T	Applied Chemistry	2	1	-	3	30	70	100	3
7	DP204P	Applied Chemistry	-	-	2	1	15	35	50	-
8	DP205T	Basics of Civil & Mechanical Engineering	2	1	-	3	30	70	100	3
9	DP206P	Workshop Practices	-	-	2	1	15	35	50	-
10	DP207T	Indian Culture & Constitution (audit)	2	-	-	-	-	-	-	-
						19			700	

Course Title	**APPLIED MATHEMATICS-II**				
Course Code	**DP201T**				
Course Credits	**L**	**T**	**P**	**TC**	
	2	1	-	3	
Prerequisites	**NIL**				
Course objectives	**This course will enable students-** 1. To acquire a basic body of mathematical knowledge that will provide the student with a strong foundation for further study and/or for a career in mathematics or in other technical or scientific fields. 2. To develop fundamental mathematical skills and the ability for independent mathematical learning and reasoning. 3. To become aware of the applications of mathematics across science and technology. 4. To learn how to use mathematical ideas and techniques to solve real life problems.				
Course Contents	**UNIT- I** **NUMERICAL ANALYSIS:** Bisection Method, False Position Method, Newton-Raphson Method **UNIT-II** **FINITE DIFFERENCES:** Interpolation forward differences, Backward differences, Factorial Polynomial, Newton's Forward interpolation, formula for equal intervals, Sterling Formula (Central Difference), Newton's Backward Formula, Lagrange's interpolation formula for unequal intervals. **NUMERICAL DIFFERENTIATION & INTEGRATION:** Numerical Differentiation (Forward & Backward Difference formula), Numerical Integration by Trapezoidal & Simpon's Rule **DIFFERENCE EQUATION:** Order of a difference equation, Solution of Difference equation, Complementary Section, Particular Integral. **UNIT- III** **MATRICS:** Introduction, Definition, Special Matrices, Addition and Subtraction of Matrices, Multiplication of Matrices, Transpose of a Matrix, Symmetric & Skew Symmetric Matrix, Ad-joint of a Square Matrix, Inverse of Matrix, Solution of simultaneous Linear equations, Rank of Matrix, Consistency of Linear System of Equations				

	UNIT-IV
	FORMATION OF DIFFERENTIAL EQUATION:
	Differential Equations. Definition, Order and Degree of Differential Equations, Formation of Differential Equations, Solution of a Differential Equation, Differential Equation of the first order and first degree, Variable Separable, Homogeneous Differential Equations, Equations Reducible to Homogeneous form, Linear Differential Equations, Equations Reducible to the Linear Form, Exact Differential Equations, Equation Reducible to the Exact Equations, Second order Linear Differential Equation with constant coefficient – Complementary function particular integral.
	UNIT-V
	LAP LACE TRANSFORMATION:
	Definition, Transforms of Elementary functions, Properties of Lap lace transforms, Transform of Derivatives.
Course outcomes	**At the end of this course students will be able to-**
	1. After completion of this course, students will have the knowledge and skills to: Explain Bisection Method, False Position Method, Newton-Raphson Method
	2.Demonstrate accurate and efficient use of Interpolation forward differences, Backward differences, Factorial Polynomial, Newton's Forward interpolation, formula for equal intervals, Sterling Formula (Central Difference, Newton's Backward Formula, Lagrange's interpolation formula for unequal intervals.
	3. Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concepts from Introduction, Definition, Special Matrices, Addition and Subtraction of Matrices, Multiplication of Matrices, Transpose of a Matrix, Symmetric & Skew Symmetric Matrix, Ad-joint of a Square Matrix, Inverse of Matrix
	4. Apply problem-solving Differential Equations, Definition, Order and Degree of Differential Equations, Formation of Differential Equations, Solution of a Differential Equation.
	5. Understand the concept of Transforms of Elementary functions, Properties of Lap lace transforms, Transform of Derivatives. Chalk and talk method to explain various laws, theorems etc, Expert Lecture, Demonstration and use of log tables, Classroom practices for different typical exercises, Use of derivation and formulas.
Text Books	1. Introductory Method of Numerical Analysis
	2. Mathematical Statistics
	3. Discrete Mathematics
	4. Linear Programming
	5. Set Theory and Related Topics Schum's Out Line Series

Reference Books	1. Finite Differences and Numerical Analysis
	2. Modern Algebra
	3. Computer Oriented Numerical Methods, PHI

Course Title	**ENGINEERING MECHANICS**
Course Code	**DP202T**

Course Credits	**L**	**T**	**P**	**TC**	
	2	1	-	3	

Prerequisites	**NIL**

Course objectives	**This course will enable students-**
	1. To provide a thorough education in the fundamentals of Mechanical engineering.
	2. Understand the vectorial and scalar representation of forces and moments.
	3. Describe static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions.
	4. Illustrate the laws of motion, kinematics of motion and their interrelationship.
	5. Comprehend the effect of Friction on general plan motion.

Course Contents	**UNIT- I**
	FUNDAMENTAL CONCEPTS
	Resultant and Equilibrium Analysis: Basic concepts and laws of mechanics, system of forces, fundamental units, Lami's theorem and free body diagram, Resultant and equilibrium of concurrent, parallel and non-concurrent co-planar force system. General numerical applications
	UNIT-II
	ANALYSIS OF PLANE TRUSSES
	Perfect truss, basic assumptions for perfect truss, analysis of axial forces in the members by method of joint and method of sections. General numerical applications.
	FRICTION
	Static, dynamic and limiting friction, Law of limiting friction, Angle of friction, friction, angle of repose, Cone of Friction, Wedge friction, Friction on inclined plane General numerical applications
	UNIT- III

	PROPERTIES OF SURFACES
	Centre of Gravity, Second moment of area, Centroid of regular plane and compound areas, Location of centroid and center of gravity polar moment of inertia, radius of gyration of area, Parallel axis theorem, Moment of inertia of composite areas, and determination of Product of inertia by integration **UNIT-IV** **KINETICS OF PARTICLES** D Alembert's principle applied to bodies having rectilinear motion, Principle of work and Energy: General numerical applications, Principle of Impulse and momentum: General numerical applications, simple lifting machines Load, Effort, study about Bevel gear, Rack and Pinion gear. Gear Trains- Simple, Compound. **UNIT-V** **FIRST LAW OF THERMODYNAMICS** Thermodynamic System, properties, process, cycle, thermodynamic equilibrium, Quasi-static Process, Zeroth Law of thermodynamics, Work and Heat transfer, flow work, general numerical application. First Law of thermodynamics, Newtons law of motion, internal energy, proof of internal energy as a point function, general numerical application of first law to non-flow process and steady flow process
Course outcomes	**At the end of this course student will be able to:** 1. Apply knowledge to real engineering application and prevent their effect. 2. Analyze various thermodynamic process involved in engineering practice. 3. Implement truss problem in realistic works. 4. Analysis the unbalance forces involved in the frame 5. Getting a knowledge of heat and mass transfer.
Text Books	**Name of the Text Books:** 1. Engineering Mechanics (Statics and Dynamics) ; A. K. Tayal ,Umesh Pub., Delhi 2. Engineering Mechanics : S. Timoshenko and D.H. Young,TMH 3. Engineering Thermodynamics: P.K.Nag, TMH 4. Engineering Thermodynamics: C.P.Arora, TMH 5. Engineering Mechanics (Statics and Dynamics): R.C.Hibbeler, Pearson 6. Engineering Mechanics:Meriam and Kreige ,John Wiley and sons
Reference Books	1. Thermodynamics: Cengel and Boles, TMH 2. Essentials of Engg Mechanics: S.Rajasekharan& G.Shankara Subramaniyam, Vikas Publications. 3. Engineering Mechanics: Basudeb Bhatytacharya , Oxford.

Course Title	**ENGINEERING MECHANICS**
Course Code	**DP202P**
Course Credits	**L | T | P | TC** **- | - | 2 | 2**
Prerequisites	**NIL**
Course objectives	1. To develop the capacity to predict the effects of force and motion while carrying out the creative design functions of engineering. 2. Get the practical knowledge and application of law of forces.
Course Contents	**LIST OF EXPERIMENTS** 1. To verify law of triangle of forces. 2. To verify the Lami's theorem. 3. To verify the law of polygon of forces. 4. To verify the law of lever. 5. To determine the support reactions of a simply supported beam subjected to point loads. 6. To draw the variation of bending moment at a given section in a simply supported beam under a moving point load. 7. To find the coefficient of friction between surfaces of wooden plane and following blocks: 8. Aluminum (ii) Tin (iii) Glass (iv) Asbestos (v) Teak ply (vi) Sand paper (vii) card board . 9. To determine the coefficient of friction between (i) Belt and pulley (ii) Rope and pulley. 10. To study simple jib crane and to determine the internal forces in members of jib crane. 11. To determine the stiffness of helical compression spring. 12. To study the lifting machine "second order pulley system" and to draw the following characteristic diagram: . (i) Load-effort diagram (ii) Load- ideal effort diagram (iii) Load-efficiency diagram Also, to determine the law of machine and the maximum efficiency of machine. 13. To study the lifting machine "Worm and worm wheel" and to draw the following characteristic diagram: . (i) Load-effort diagram (ii) Load- ideal effort diagram (iii) Load-efficiency diagram Also, to determine the law of machine and the maximum efficiency of machine.

	14. To study the lifting machine "Geared Jib crane" and to draw the following characteristic diagrams. (i) Load-effort diagram (ii) Load- ideal effort diagram (iii) Load-efficiency diagram Also, to determine the law of machine and the maximum efficiency of machine. 15. To study the lifting machine "Single Purchase Winch crab" and to draw The following characteristic diagrams (i) Load-effort diagram (ii) Load- ideal effort diagram (iii) Load-efficiency diagram Also, to determine the law of machine and the maximum efficiency of machine. 16. To study the lifting machine "Double Purchase Winch crab" and to draw the following characteristic. (i) Load-effort diagram (ii) Load- ideal effort diagram (iii) Load-efficiency diagram Also, to determine the law of machine and the maximum efficiency of machine. 17. Study of Thermodynamics Law's and their applications.
Course outcomes	**At the end of this course student will be able to:** 1. Visualize physical configurations in terms of real materials, actual constraints, and the practical limitations which govern the behavior of machines and structures. 2. The principles and their limitations are learned together within the context of engineering application.
Text and References	**Name of the Text Books:** 1. Engineering Mechanics (Statics and Dynamics) ; A. K. Tayal ,Umesh Pub., Delhi 2. Engineering Mechanics: S. Timoshenko and D.H. Young,TMH 3. Engineering Thermodynamics: P.K.Nag, TMH 4. Engineering Thermodynamics: C.P.Arora, TMH 5. Engineering Mechanics (Statics and Dynamics): R.C.Hibbeler, Pearson 6. Engineering Mechanics:Meriam and Kreige ,John Wiley and sons 7. Thermodynamics: Cengel and Boles, TMH 8. Essentials of Engg Mechanics: S.Rajasekharan& G.Shankara Subramaniyam, Vikas Publications. 9. Engineering Mechanics: Basudeb Bhatytacharya, Oxford

Course Title	**FUNDAMENTAL OF COMPUTER APPLICATION**				
Course Code	**DP203T**				
Course Credits	**L**	**T**	**P**	**TC**	
	2	1	-	3	
Prerequisites	To know about fundamental knowledge of Computer system and Internet.				
Course objectives	**This course will enable students-** 1. To understand basics of computer and working with OS. 2. To develop working skills with productivity tools, graphics designing and Internet. 3. To acquire basic programming skills. 4. To apply computing in problem solving.				
Course Contents	**UNIT- I** **INTRODUCTION TO COMPUTERS & MICROCOMPUTER:** Generations of Computer. First, Second, Third and Fourth generation Hardware, Software, Firm Ware with Examples, Classification & Applications of Computers. Micro, Mini, Mainframes and Super-Computers Applications of computers. **UNIT-II** **DATA REPRESENTATION & NUMBER SYSTEM CONVERSION & ITS OPERATIONS:** Number Systems, Types of number systems - Binary, Octal, Decimal, Hexadecimal Bit, Byte, Nibble, ASCII code, BCD Code, Gray, Excess3, EBCDIC. Binary addition, subtraction, BCD addition, subtraction, 1's complement and 2's complement methods. **UNIT- III** **COMPUTER LANGUAGES & INTRODUCTION TO OPERATING SYSTEMS:** Classification and characteristics of languages : Machine language, Assembly language, High level language, Computer Hardware, Classification of Software, and firmware, System software : Operating, System, Loader, Linker, Interpreter, Compiler and Assembler, Application Software, Micro-Soft Disk Operating System(MSDOS), System files: BIOS, COMMAND.COM, CONFIG.SYS, Autoexec.bat file, MS-DOS Commands : Internal Commands- dir, cd, md, rd, del, ren, date, time, vol. and copy, External commands : attrib, format, edit, find, disk copy, backup & Restore. **UNIT-IV** **WINDOWS:** Introduction to Windows, Starting Windows, Desk Top, Task Bar, Start Up Menu Working with programs and icons-Adding, removing, starting and quitting programs and icon. Working with files and folders-creating, deleting, opening, finding,				

copying, moving and renaming files and folders. Control Panel, setting, My Computer, Recycle bin, My documents, drives. Windows notepad, Accessories and windows Explorer.

MS-WORD:

Overview of Word Processing, Parts of word window, Types of Menus, Opening, creating saving, cut, copy and paste, print and print preview. Find and Replace, Header& Footer, save & save as, Borders and shading, Bullets & Numbering, spelling and Grammar, Word count, Mail Merge, Table handling and important shortcut keys, Macros.

MS-POWER POINT:

Overview of MS-PowerPoint, Slides, PowerPoint views, Auto content wizard, Custom Animation, Transition and build effects, Printing slides and important shortcut keys.

UNIT-V

INTERNET TECHNOLOGY & INTERNET CONNECTIVITY:

Introduction To Internet, Different Services Of Internet, WWW, Email, Chat (textual/voice), Bulletin Boards, Video conferencing, FTP (uploading and downloading files), Internet Service Provider(ISP), Internet accounts : Shell account, TCP/IP ISDN and Leased Line, account and its features, Hardware Required, MODEM and Terminal Adapters.

Course outcomes	**At the end of this course student will be able to:** 1. Understanding the concept of input and output devices of Computers. 2. Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices. 3. Understand an operating system and its working, and solve common problems related to operating systems 4. Learn basic word processing, Spreadsheet and Presentation Graphics Software skills. 5. Study to use the Internet safely, legally, and responsibly.
Text Books	1. Introduction to Computers - Peter Norton's, Tata McGraw Hills Publishing Co.l Ltd.N. Delhi, IInd Edition, 1998 2. The Internet Book - Douglas E., Prentice Hall of India Pvt.Ltd, N.Delhi, II – Edition, 2000 3. Floyd, Thomas L, "Digital Computer Fundamentals", 10 th Edition, University Book Stall, 1997.
Reference Books	1. Fundamentals of Computers, V Rajaraman 6th edition PHI Learning Private Limited 2014. 2. Peter Norton: Computing Fundamentals. 6th Edition, McGraw Hill-Osborne,2007. 3. Alexis Leon and Marthews Leon: Introduction to Computers, Leon Vikas,1999.

Course Title	**FUNDAMENTAL OF COMPUTER APPLICATION**			
Course Code	**DP203P**			
Course Credits	**L**	**T**	**P**	**TC**
	-	**-**	**2**	**2**
Prerequisites	To Know about MS-Word, MS-Excel, MS-Power point and Internet Services.			
Course objectives	1. Get basic knowledge of computer and its functioning. 2. Able to work on MS Word and Excel sheet and other function of computer. 3. Knowledge of various operating systems.			
Course Contents	**LIST OF EXPERIMENTS** 1. Study of input and output devices 2. Study of storage devices 3. Practice on internal and external MS-DOS commands 4. Practice on Windows95/98/2000 • Starting Windows, Exploring the desktop, Arranging windows, My Computer, The start button, Creating Shortcuts, Practice on moving and sizing of windows • Study of file organization: creating, copying, moving, renaming and deleting • Practice on Windows Accessories- Notepad, Word Pad and Paint • Editing document & formatting text, Previewing and printing document/Image file • Practice on Windows Explorer • Recycle bin • Shutting down windows 5. Practice on MS-Word • Create and format document • Edit and Modify text- changing font size type and style • AutoText, AutoComplete, AutoCorrect, grammar and spellchecker, Find and replace of text • Open save and print a document • Insert, modify table 6. Practice on Microsoft Excel • Create, save &format worksheet, Open and save worksheet file • edit &modify data, use formula and functions • split windows and freeze pans			

	• Create, edit, modify, print worksheet/charts.
	
	 7. Practice on PowerPoint
	
	    • Create, edit, insert, move, slides, Open and save presentation
	
	    • Insert picture, slide layout, action button, Present slide show
	
	 8. Practice on:
	
	    • Identification of type of Account.
	
	    • Connecting to internet, Dial up access
	
	    • Web browsing Searching websites Information searching, Email services.
	
	    • Creating email accounts & Receiving and sending mails.

Course outcomes	**At the end of this course student will be able to:** 1. Work on word and excel sheet and make reports. 2. Access an account and create new web account. 3. They will be able to make PPT and similar work. 4. Understand the working with Internet services. 5. They will be able to work with Paint brush.
Text and References	**Name of the Text Books:** 1. Introduction to Computers - Peter Norton's, Tata McGraw Hills Publishing Co.lLtd.N. Delhi, IInd Edition, 1998 2. The ABCs of Ms- Office 97 - Gay Hart Davis, BPB Publications N. Delhi, Ist Edition 1996 3. Computer Organization and Architecture - William Stalling, Prentice Hall of India Pvt.Ltd ,N.Delhi, IV th - Edition, 1999 4. Structured computer Organization - Andrews Tanenbaum, Prentice Hall of India Pvt.Ltd,N.Delhi, III rd- Edition, 1997

Course Title	**APPLIED CHEMISTRY**				
Course Code	**DP204T**				
Course Credits	**L**	**T**	**P**	**TC**	
	2	1	-	3	
Prerequisites	**NIL**				
Course objectives	**This course will enable students-** 1. Understand the basic sciences before trying to learn their application in various branches. 2. Learn chemistry behind various materials metals and non-metals. 3. Get knowledge about various fuels and lubricant available and useful in practice.				
Course Contents	**UNIT- I** **Atomic Structure:** Electronic structure of atoms, Discovery of electrons, protons and neutrons. Rutherford, model and Bohr's, Bohr's – Burry scheme of distributions of electrons. Dual nature of matter and Radiations, De-Broglie's Equation, Heisenber's uncertainty principle, quantum numbers, sub energy level and distribution of electrons in sub-shells and concept of electronic configuration of atoms, Auffbaus's rule, Pauli's exclusion principle. Hund's rule of maximum multiplicity. **Periodic Table and Periodic properties:** Introduction, modern Periodic law classification of elements In to s-, p, d & f-block elements Periodic properties of elements, Periodicity atomic and ionic radii, ionization potential, electron affinity, Electronegativity. **Chemical Bonding:** Theory of Chemical Bonding, Types of Bonds, Ionic or electrovalent bonds, Covalent bond, coordination bond, Hydrogen bonding concept of resonance. **UNIT-II** **Electro Chemistry:** Electrolytes and conductors, strong and weak electrolyte, conductivity, Arrhinius theory of electrolysis, Kohlrausch law, Ostwald dilution laws, Transport no. Faraday's Law of Electrolysis Electrochemical equivalent, Definition of pH, Law of mass action, Buffer solutions, calculation of Ph. Value of a Buffer solution, Acid Base Concept. **Colloids:** Types of colloidal solution, preparation of colloids, properties of colloidal solutions, Origin of change on colloidal particles, precipitation of Coagulation of colloidal solution. Protective colloids and gold number, Emulsions cleansing action of soaps, Detergents, Gels.				

UNIT- III

Metal and metallurgy:

Occurrence, extraction, properties and engineering uses of heavy metals with special reference to Cu, Fe, Zn, Al, Si, Ge, C Electromagnetic properties of Fe, Ni, Co, Cr.

Metal & Its Alloys:

Properties, constitution and Engineering uses of common alloys like Brass, Bronze, German Silver, Duralumin, Solder, stainless steel pressure and die casting alloy, Bearing alloys.

Corrosion and protection:

Corrosion of metals, Types of corrosion, Galvanic Series, corrosion control, protective coatings. Coating processes with special emphasis on electroplating and electro typing.

UNIT-IV

Polymers & Polymerization:

Physical properties of the polymer's condensation and addition polymerization. Copolymers, effect of structure of polymer on properties, classification of polymers, Rubber –Vulcanization and compounding reclaimed rubber, Bunas SBR Neoprene ,Poly urethanes silicons, Fibers- Nylon, Dacron, orlon, polyester,

Fuels and Explosives:

Classification of fuels, solid fuels, liquid fuels, gaseous fuels, characteristics of a good fuel, calorific value, Determination of calorific value by Bomb calorimeter, Explosives- classification and application.

Lubricants, Paints and Varnishes:

Lubricant- meaning types, theory of lubrication, properties of a good lubricants with special emphasis on Flash, Fire point, pour paint and cloud point. Specification number and viscosity, Paints and Varnish – Constituents, properties and uses.

UNIT-V

Water Treatment:

Water hardness, types and units, Determination of hardness of water by E.D.T.A. method and O Hehners method. Softening of hard water, lime soda process and Permutit process.

Pollution:

Pollution – meaning, causes of Pollution, air pollution, pollutants, causes of depletion of ozone layer, influence of ozone layer depletion. Acid rain, Water pollution, sources of Water pollution BOD, COD, Soil pollution, Greenhouse effect, Radioactive Pollution, Effects and preventive measures of pollution.

Course outcomes	**At the end of this course student will be able to:** 1. Understand the structure of atom and nuclear chemistry.

	2. Application of knowledge of electrolysis in engineering applications.
	3. Understand the formation process/reactions of various molecules.
	4. Learn about fuels and its uses.
	5. Understand the knowledge about water treatment and pollution.
Text Books	**Name of the Text Books:** 1. Engineering Chemistry by O. P. Agrawal. 2. Engineeraing Chemistry by Jain and Jain. 3. Physical Chemistry by Glosstone.
Reference Books	1. Organic Chemistry by Sarkar and Rakshit. 2. Engineering Chemistry by M. M. Uppal Revised by S. C. Bhatia. 3. Modern Text Book of Applied Chemistry by P.C. Jain, Dr. G. C. Saxena and Dr.A. K. Goswami.

Course Title	**APPLIED CHEMISTRY**				
Course Code	**DP204P**				
Course Credits	**L**	**T**	**P**	**TC**	
	-	**-**	**2**	**2**	
Prerequisites	**NIL**				
Course objectives	Upon completion of the course the student shall be able to: 1. Understand the basic sciences before trying to learn their application in various branches. 2. Learn chemistry behind various materials metals and nonmetals.				
Course Contents	**LIST OF EXPERIMENTS** 1. Identification of two cations and two anions in a given sample of ore/powder/mixture. 2. To determine percentage of copper in a given sample by Brass titration. 3. To determine percentage of Iron in a iron salt by redox titration. 4. Calorimetric estimation of metals in a given sample of a alloy. 5. Measurement of Ph of different solutions. 6. To find out the hardness of water by EDTA method. 7. Proximate analysis of a sample of coal. 8. To find out the Flash point/Fire point of dry/nondrying oils. 9. Determination of Viscosity by Red wood Viscometer. 10. Determination of Calorific value (C.V.) of solid fuel by Bomb Calorimeter.				
Course outcomes	**At the end of this course student will be able to:**				

	1. Dual nature of matter and Radiations, De-Broglie's Equation, Heisenber's uncertainty principle, quantum numbers, sub energy level and distribution of electrons in sub-shells and concept of electronic configuration of atoms. 2. Properties, constitution and Engineering uses of common alloys like Brass, Bronze.
Text and References	**Name of the Text Books:** 1. Organic Chemistry by Sarkar and Rakshit. 2. Engineering Chemistry by M. M. Uppal Revised by S. C. Bhatia. 3.Modern Text Book of Applied Chemistry by P.C. Jain, Dr. G. C. Saxena and Dr.A. K. Goswami.

Course Title	**BASICS OF CIVIL & MECHANICAL ENGINEERING**			
Course Code	**DP205T**			
Course Credits	**L**	**T**	**P**	**TC**
	2	1	-	3
Prerequisites	**NIL**			
Course objectives	**This course will enable students-** 1. To make students learn the scope of various fields of civil engineering. 2. To introduce students to basic concepts and first laws of thermodynamics. 3. To impart knowledge of mechanical properties of materials &theories of deformation. 4. To study about various engineering materials.			
Course Contents	**UNIT- I** **INTRODUCTION OF CIVIL ENGINEERING** Introduction and scope of civil engineering. Role of engineers in the infrastructure development. **GENERAL CONCEPT RELATED TO BUILDING** Selection of site. Basic functions of buildings. Types of buildings-Residential, Public, Commercial and Industrial. Principles of planning, orientation of buildings, introduction to bye –laws regarding Building line, Height of building, open space requirement, F.S.I., Carpet area, build up area, setbacks, ventilation. **COMPONENTS OF BUILDINGS** Introduction to types of loads on buildings.			

Substructure- Types of soil, rocks, foundations strata, concept of bearing capacity, types of foundation and their suitability.

Super structure- Types of construction, load bearing, framed and composite.

UNIT-II

BUILDING MATERIALS & SURVEYING

Introduction to basic construction materials: cement, bricks, stones, aggregates, reinforcing steels, structural glazing, And structural steel: concrete types: PCC, RCC, Pre-stressed, Precast, and Ready mix concrete. Use of various eco-friendly materials in construction.

SURVEYING: Object, Principles & Types of Surveying; Site Plans, Plans& Maps; Scales & Unit of different Measurements. Linear Measurements: Instruments used. Linear Measurement by Tape, ranging out Survey Lines and overcoming Obstructions; Measurements on sloping ground; Tape corrections, conventional symbols

UNIT- III

THERMODYNAMIC SYSTEM: Thermodynamic System and Control Volume Thermodynamic property. Zeroth Law of thermodynamics.

WORK AND HEAT: Work and Heat as Path function, Flow work, non-flow process versus flow process, work done in frictionless Quasi-Equilibrium process, First Law of thermodynamics: - 1st law of thermodynamics and its application.

UNIT-IV

MECHANICAL PROPERTIES OF MATERIALS: Stress-strain diagrams for engineering materials, young's modulus, Yield strength, Tensile strength, Elasticity, Plasticity, Ductility, Malleability, Brittleness, Toughness, Stiffness, Hardness, Hardenability, Fatigue and Creep.

UNIT-V

DEFORMATION OF METALS: Elastic deformation: Elastic after effect, Plastic deformation: deformation by slip (shear deformation), Dislocation theory - edge dislocation, screw dislocation. Strain hardening, Seasons cracking, Bauschinger effect, Yield point phenomena and related effects, Cold and hot working processes, Effect of cold work, recovery, recrystallization, grain growth on properties of crystalline materials.

Course outcomes	**At the end of this course students will be able to-** 1. Introduction to what constitutes Civil Engineering. 2. Identifying the various areas available to pursue and specialize within the overall field of Civil Engineering. 3. Apply basic concepts and first laws of thermodynamics to analyze thermodynamics system.

	4. Apply the concepts of second law of thermodynamics and entropy to analyze thermodynamics system 5. Define basic mechanical properties of materials & explain the theories of deformation.
Text Books	1. Elements of Civil Engineering: By S.S. Bhavikatti 2. Concrete Technology: By M.S. Shetty 3. Surveying and Levelling: By Kanetkar and Kulkarni 4. Building Construction: By Sushil Kumar 5. Engineering Thermodynamics – P.K. Nag – TMH. 6. Thermodynamics- An Engineering Approach – Cengal & Boles – McGraw Hill. 7. Elements of Strength of Material – Timoshenko & Young- EWP press. 8. Manufacturing Engineering and Technology – S. Kalpakjian & S.R. Schmid – Addision Wesley Longman, New Delhi.
Reference Books	1. Basic Civil Engineering: By Dr. B.C. Punamia, Ashok Kumar Jain, Arun Kumar Jain. 2. G K Hiraskar, (1st Edition, 2004), "Basic Civil Engineering", Dhanpat Rai Publication 3. Surveying Vol .I & II by Dr. B. C. Punamia Publication Laxmi Publication Delhi 4. Title: Surveying Vol. I and II, Author : S. K. Duggal, Publisher : Tata Macgraw hill Publication New Delhi. 5. Title: Building Construction, Author: Dr. B. C. Punamia, Publisher: Laxmi Pub. Delhi. 6. Fundamental of engineering thermodynamics- R.Yadav-CPH. 7. Strength of Materials – R.K. Rajput – Dhanpat Rai & Sons.

Course Title	**WORKSHOP PRACTICES**			
Course Code	**DP206P**			
Course Credits	**L**	**T**	**P**	**TC**
	-	**-**	**2**	**2**
Prerequisites	**NIL**			
Course objectives	1. To generalize the theories of workshop by identical methods. 2. To Develop ability to perform various engineering works in practice. 3. To implement new pattern technic for the Advance workshop process.			

Course Contents	**LIST OF EXPERIMENTS**
	1. **Measurement Identification and use of the various measuring tools & instruments.**
	2. **Wood working (carpentry shop)**
	   a. Identification of carpentry tools and their uses.
	   b. Perform various wood working operations.
	3. **Fitting Shop**.
	   a. Identification of various tools used and the operations performed in fitting shop.
	   b. Perform various fitting operations.
	   c. Marking of job as per dimension.
	   d. Sawing.
	   e. Chipping.
	   f. Filling.
	   g. Taping.
	   h. Reaming.
	   i. Drilling.
	4. **Welding Shop**
	   a. Identification and use of the various tools and equipment.
	   b. Perform the Electric arc welding and gas welding operations.
	   c. Perform the soldering and Brazing operations.
	5. **Machine Shop**
	 a. Lathe Machine operations.
	 b. Shaper Machine operations.			

Course outcomes	**At the end of this course student will be able to:** 1. After completion of this course, students will be able to set the methods by technical and methodological ways. 2. All the students will learn the welding practices successfully. 3. Students Know about the various machine tools and operations.			

	Name of the Text Books:
Text and References	1. Workshop Technology (Vol-1) Hazra & choudhary.
	2. Workshop Technology – (Vol-1 & 2) Chapnan
	3. Manufacturing process (Vol-1 Delela
	4. Materials and Manufacturing Lindberg processes.

Course Title	**INDIAN CULTURE & CONSTITUTION (AUDIT)**			
Course Code	**DP207T**			
Course Credits	**L**	**T**	**P**	**TC**
	2	-	-	2
Prerequisites	**NIL**			
Course objectives	1. The objects of civilization after some time acquire a cultural aspect. 2. The main objective of fatigue study is to determine the amount and frequency of the break time or rest intervals in order to complete a task or the job. 3. It is mainly done in order to improve and boost the efficiency level of the staff or the employees**.** 4. To focus on the physical condition of the slum scenario and many problems of the slum related to this location.			
Course Contents	**UNIT- I** Concept of culture and civilization, Vedic civilization and Indus valley civilization, introduction to Vedas, ashram system, Varna system, concept of social engineering. **UNIT-II** Meaning and scope of industrial psychology and industrial sociology, recruitment, selection and training of workers, fatigue in industry, motive for work in industry. **UNIT- III** Sustainable development, social charge, professional ethics, concept and styles of leadership in industry. **UNIT-IV** Indian constitution and federal system, fundamental rights and directive principles of state policy, role of bureaucracy in modern society, socio-legal awareness: right to information, public interest ligation (PIL). **UNIT-V** Industrial democracy, work organization: formal and informal organization, concept of power, authority and status system, industrialization, urbanization and study of slums in India.			

Course outcomes	**At the end of this course student will be able to:** After successful completion of this course, the students should be able to: 1. Students will become aware of Indian culture and civilization and their role in development of society. 2. Student will understand industrial work culture. 3. Students will be sensitized towards professional ethics. 4. Student will understand Indian constitution and governance of the country. 5. Students will be able to understand the structure and system of work organizations.
Text Books	1. A new look into social science- Shabbie, Sheik and dwadashiwar 2. An introduction to sociology-Vidya bhushan and sachdeva 3. Social science: the Indian scene-Yogesh atal 4. A histry of world civiliazation-J. E. Swain
Reference Books	1. Human Resouce Development and management-Dr. A. M. Sheikh 2. The economics of sustainable development- Surender Kumar 3. Applied humanities-Rajni Tandon 4. Introduction to constitution of India-Durga das basu.