DR. VIRENDRA SWARUP INSTITUTE OF VOCATIONAL STUDIES

SYLLABUS

(CYBER CECURITY)

COURSE CODE: COE38

COURSE NAME: CVESD CYBER SECURITY

COURSE DURATION: SIX MONTHS

SESSION: 2024-25

DEPARTMENT OF COMPUTER APPLICATION

DR. VIRENDRA SWARUP INSTITUTE OF VOCATIONAL STUDIES, MC ROBERT GANJ, CIVIL LINES, KANPUR (UP) 208001

CourseCode CourseName

COE38-01 Technical English

CO1	Inculcate Process of Communication and identify barriers in communication.
CO2	Develop skills for working in team and individually.
CO3	Inculcate soft skills and develop personality through participation in group discussion, mock interview, group and individual presentation.
CO4	Describe the usage of computers and why computers are essential components in business andsociety.
CO5	Understanding the concept of Computer memory and input/output devices of Computers and howit works and recognize the basic terminology used in computer programming.

Course Outcomes: At the end of the course, the student will be able to,

UNIT-I

The Process of Communication:

Communication, the Process of Communication, Barriers of Communication, Different Types of Communication, Characteristics and Conventions of Conversation, Conversational Problems of Second/Foreign Language Users, Difference Between Conversation and Other Speech Events.

UNIT- II

Soft Skills Training:

Soft Skills Practice, Personality Development, Participating in Group Discussion and JobInterviews, Time Management Presentation Skills, Leadership Skills, LateralThinking, Team Work and Interpersonal Skills, Emotional Intelligence, Self-Confidence and Attitude.

UNIT- III

Speaking Skills and Presentation:

Presentation Design and Delivery. Monologue Dialogue, Group Discussion. Effective Communication/ Mis-Communication. Interview. Effective Writing, Report Writing, Resumeand letter Writing.

UNIT-4

Introduction to Computer: Definition - History & Generation of Computer (From First to 5^{th}) - Applications of Computer – Advantages of Computer – Terms related to Computer - Characteristics of Computer: Speed, Storage, Versatility and Diligence – Hardware &

Software. Block Diagram and Working Principle of Computer - Types of Computer: On the Basis of Working - Analog, Digital & Hybrid, On the Basis of Size - Main frame, Mini Computer, Super Computer, Work station, Micro Computer, Desktop Computer, Laptop Computer

UNIT-5

Memory: Units, Representation, Types - Primary memory: RAM, ROM, PROM, EPROM, EEPROM, DDR Secondary memory: Hard disk, CD, DVD, Blue ray Disc, Pen Drive Magnetic tape & Zip disk – **CPU:** Components of CPU - Mother board, Hard disk, RAM, ROM, Processor, SMPS & Connecting wire - Graphics Card, Sound Card, Network Card – Modem; **Input, Output devices**: Keyboard, Mouse, Scanner, Digital Camera, Joystick, Pen drive, Monitor, Printer, Plotter – Connecting port – Serial, parallel – USB port.

Referential Books:

1. Wren and Martin -English Grammar and Composition
2. B. K. Das- an Introduction to Professional English and Soft Skills
3. Barun K. Mitra- Personality Development and Soft Skills

Course Code	Course Name	L	T	P
		3	0	0
COE38-02	Engineering Mathematics -I			

CO1	Algebraic operations proficiently to solve mathematical problems encountered in engineering.
CO2	Demonstrate a deep understanding of limits, continuity, and differentiation techniques.
CO3	Understand the principles of analytical geometry and apply them to solve problems involving lines, planes, and curves in both two and three dimensions.
CO4	Manipulate vectors and vector operations adeptly in engineering contexts.
CO5	Understand matrices, determinants, and their applications in solving systems of linear equations and transformations.

UNIT-1

Differential Calculus-I

Introduction , nth Derivative of Some Elementary Functions, Leibnitz's Theorem, Partial Differentiation, Function of Two Variables, Partial Differential Coefficients, Homogeneous Function, Euler's Theorem on Homogeneous Functions, Total Differential Coefficient, Curve Tracing, Procedure for Tracing Curves in Cartesian Form, Polar Curves, Parametric Curves, Expansion of Function of Several Variables,Taylor's Theorem for Functions of Two Variables Exercise

UNIT 2:

Differential Calculus-II

Jacobian,Approximation of Errors,Extrema of Function of Several Variables,Lagrange's Method of Undetermined

UNIT-3

MatricesIntroduction, Definition of Matrix, Types of Matrices, Operations on Matrices, Trace of Matrix, Properties of Transpose, Properties of Conjugate Matrices, Singular and Non-Singular, Matrices, Adjoint of a Square Matrix

UNIT-4

Multiple Integrals, Multiple Integrals, Double Integrals, Working Rule, Double Integration for Polar Curves, Change of the Order of Integration, Change of Variables in a Multiple Integral
Beta and Gamma Functions, Transformations of Gamma Function, Transformations of Beta Function, Relation between Beta and Gamma Functions

UNIT-5

Vector Calculus, Vector Differential Calculus, Vector Function, Vector Differentiation

Referential Books :

1. A Textbook of SECOND EDITION ENGINEERING MATHEMATICS-I- Prabhakar Gupta
2. ENGINEERING MATHEMATICS - H.K DASS

Course Code	Course Name	L	T	P
COE-38-03	Engineering Physics / Engineering Chemistry	3	0	0

CO1	Students should demonstrate a comprehensive understanding of classical mechanics, electromagnetism, thermodynamics, quantum mechanics, and other foundational physics concepts.
CO2	Ability to apply advanced mathematical techniques such as calculus, differential equations, linear algebra, and vector calculus to solve complex physics problems.
CO3	Proficiency in analyzing and solving engineering problems using principles from physics, including the ability to formulate mathematical models for physical systems.
CO4	Familiarity with experimental methods and laboratory equipment used in physics and engineering, including data collection, analysis, and interpretation.
CO5	Capability to apply physics principles to design and optimize engineering systems and devices, considering factors such as efficiency, cost, and environmental impact.

UNIT-1

Inertial & non-inertial frames, Galilean transformations, Michelson-Morley experiment, Einstein's postulates, Lorentz transformation equations, Length contraction & Time dilation, Relativistic addition of velocities; Variation of mass with velocity, Mass energy equivalence, Concept of rest mass of photon.

UNIT-2

Black body radiation spectrum, Weins law and Rayleigh-Jeans law, Assumption of quantum theory of radiation, Planck's law. Wave-particle duality, de-Broglie matter waves, Bohr's quantization rule, Phase and Group velocities, Davisson-Germer experiment, Heisenberg uncertainty principle and its applications, Wave function and its significance, Schrödinger's wave equation (Time dependent and time independent) – particle in one dimensional potential box, Eigen values and Eigen function.

UNIT-3

Interference: Coherent sources, Interference in thin films (parallel and wedge shaped film), Newton's rings and its applications.. Diffraction: Single, double and N- Slit Diffraction, Diffraction grating, Grating spectra, dispersive power, Rayleigh's criterion and resolving power of grating.

UNIT-4

Polarization: Phenomena of double refraction, Nicol prism, Production and analysis of plane, circular and elliptical polarized light, Retardation Plate, Optical Activity, Fresnel's theory, Specific

rotation. Laser: Spontaneous and stimulated emission of radiation, population inversion, Einstein's Coefficients, Concept of 3 and 4 level Laser, Construction and working of Ruby, He-Ne lasers and laser applications.

UNIT-5

Fiber Optics: Fundamental ideas about optical fiber, Propagation mechanism, Acceptance angle and cone, Numerical aperture, Single and Multi Mode Fibers, Dispersion and Attenuation. Holography Basic Principle of Holography, Construction and reconstruction of Image on hologram and applications of holography.

Referential Books :

1) Concepts of Modern Physics - Aurthur Beiser (Mc-Graw Hill)
2) Introduction to Special Theory of Relativity- Robert Resnick (Wielly)

Course Code	Course Name	L	T	P
COE-38-03	Engineering Physics / Engineering Chemistry	3	0	0

CO1	Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
CO2	The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
CO3	They can learn the fundamentals and general properties of polymers and other engineering materials.
CO4	They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

UNIT-1

Introduction to hardness of water – Estimation of hardness of water by complexometric method and related numerical problems. Potable water and its specifications - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and break - point chlorination. Defluoridation - Determination of F- ion by ion- selective electrode method. Boiler troubles: Sludges, Scales and Caustic embrittlement. Internal treatment of Boiler feed water - Calgon conditioning - Phosphate conditioning - Colloidal conditioning, External treatment methods - Softening of water by ion- exchange processes. Desalination of water – Reverse osmosis.

UNIT – II

Introduction - Classification of batteries- primary, secondary and reserve batteries with examples. Basic requirements for commercial batteries. Construction, working and applications of: Zn-air and Lithium ion battery, Applications of Li-ion battery to electrical vehicles. Fuel Cells- Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell and Solid oxide fuel cell. Solar cells - Introduction and applications of Solar cells. Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current methods.

UNIT - III:

Definition – Classification of polymers with examples – Types of polymerization – addition (free radical addition) and condensation polymerization with examples – Nylon 6:6, Terylene Plastics: Definition and characteristics- thermoplastic and thermosetting plastics, Preparation, Properties and engineering applications of PVC and Bakelite, Teflon, Fiber reinforced plastics (FRP). Rubbers: Natural rubber and its vulcanization. Elastomers: Characteristics –preparation – properties and applications of Buna-S, Butyl and Thiokol rubber. Conducting polymers: Characteristics and Classification with examples-mechanism of conduction in trans-polyacetylene and applications of

conducting polymers. Biodegradable polymers: Concept and advantages - Polylactic acid and poly vinyl alcohol and their applications.

UNIT - IV:

Energy Sources : Introduction, Calorific value of fuel – HCV, LCV- Dulongs formula. Classification- solid fuels: coal – analysis of coal – proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining, cracking types – moving bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol - Fischer-Trops ch's process; Gaseous fuels – composition and uses of natural gas, LPG and CNG, Biodiesel – Transesterification, advantages.

UNIT - V:

Cement: Portland cement, its composition, setting and hardening. Smart materials and their engineering applications Shape memory materials- Poly L- Lactic acid. Thermoresponse materials- Polyacryl amides, Poly vinyl amides Lubricants: Classification of lubricants with examples- characteristics of a good lubricants – mechanism of lubrication (thick film, thin film and extreme pressure) properties of lubricants: viscosity, cloud point, pour point, flash point and fire point.

Referential Books :

1) Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010
2) Engineering Chemistry by Rama Devi, Venkata Ramana Reddy and Rath, Cengage learning, 2016

Course Code	Course Name	L	T	P
COE-38-04	Engineering Graphics	3	0	0

CO1	Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
CO2	Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
CO3	Use of geometric transformations on graphics objects and their application in composite form.
CO4	Extract scene with different clipping methods and its transformation to graphics display device.
CO5	Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

UNIT-I

Introduction: Interactive Computer Graphics, Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Conceptual Framework for Interactive Graphics, Classification of Application Development of Hardware and software for computer Graphics.

UNIT-II

Scan Conversion: Scan Converting Lines, Scan Converting Circles, Scan Converting Ellipses.
Clipping: point clipping, Cohen-Sutherland line clipping Algorithm, Midpoint Subdivision Algorithm, polygon clipping (Sutherland-Hodgeman)

UNIT-III

Geometrical Transformation: 2D Transformation (translation, rotation, scaling, reflection and shearing), Homogeneous Coordinates and Matrix Representation of 2D Transformations, Successive and composite 2D Transformations, the Window-to-Viewport Transformations, Introduction to 3D Transformations Matrix.

UNIT-IV

Curves & Surfaces: Polygon Surfaces and polygon meshes, Quadratic and super quadrics surfaces, Spline curve and representation.

UNIT-V

Computer Animation: introduction, Application of animation, Morphing, Keyframe system, Motion specifications in Animation, Types of animation, Sequencing of Animation Design and Fundamental principles of animation.

Referential Books:

1. Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles& practice,2000.
2. D.J. Gibbs & D.C. Tsichritzs: Multimedia programming Object Environment& Frame work, 2000

Course Code	Course Name	L	T	P
		3	0	0
COE-38-05	Computer Programming			

CO1	Able to understand the basic knowledge of Computer fundamental and its application in computers.
CO2	Able to understand the basic knowledge of Computer fundamental and its application in computers.
CO3	Able to design and develop various programming problems using C programming concepts.
CO4	Able to Implement advance C programming concepts like function, pointer, structure and Union
CO5	Able to understand the file handling using C Programming language.

UNIT-I

Fundamentals of C programming and Control Structures: History, Structure of a C program, C Conventions, Character Set, Identifiers, Keywords, Simple Data types, Modifiers, Variables, Constants, Operators, Operator precedence. Input and Output operation: Single character input and output, formatted input and output.Control Structures, Conditional statementand switch statement. Goto statement. Looping statement,break and continue, nested for statement.

UNIT-II

Arrays and Functions: Introduction (One and multi-dimensional), Declaration of arrays, Initialization of arrays, processing with arrays. String manipulation, declaration of string arrays, string operations. Functions: Introduction, advantages of functions, Function definition, function call, Actual and formal arguments, local and global variables, function prototypes, types of functions, recursive functions, arrays and functions.

UNIT-III

Searching and Sorting:selection sort, bubble sort, insertion sort, quick sort, merge sortSearching: linear and binary search methods, comparison of sorting and searching methods.

UNIT-IV

Structures and Pointers: Introduction to structures, Advantages of structures, accessing elements of a structure, nested structures, array of structures, functions and structures, Pointers: Introduction, pointer variable, pointer operator, pointer arithmetic, pointers and arrays, pointers and strings, array pointers, dynamic allocation.

UNIT-V

Files, Preprocessor, standard library and header files: Files: Introduction, File data type, opening and closing a file, file functions (getc, putc, getw, putw, fscanf, fprintf, fread, fwrite, fgets, fputs, feof). Preprocessor: #define, #include, #undef, Conditional compilation directives, C standard library and header files: Header files, string functions, mathematical functions, Date and Time functions

Referential Books :

1. Let us C-Yashwant Kanetkar.
2. Programming inC-Balguruswamy

Course Code	Course Name	L	T	P

		L	T	P
COE38-07	**PRACTICAL-I**	**0**	**0**	**3**

(COMPUTER PROGRAMMING LABORATORY)

Course Code	Course Name	L	T	P
COE38-08	**PRACTICAL-II**	**0**	**0**	**3**

(ENGINEERING PRACTICES LABORATORY –I)

Course Code	Course Name	L	T	P
COE38-09	**PRACTICAL-III**	**0**	**0**	**3**

(COMMUNICATION SKILL LABORATORY –I)

Course Code	Course Name	L	T	P
COE38-10	**PRACTICAL-III**	**0**	**0**	**3**

(PHYSICS LABORATORY / CHEMISRTY LABORATORY)