

Faculty of Engineering and Technology

P.K.University

Shivpuri (MP)



**Evaluation Scheme & Syllabus for
Department of Computer Science Engineering & IT**

Diploma CS I Year

(I & II Semester)

(Effective from session 2019-20)

Department of Computer Science Engineering &IT
(Faculty of Engineering and Technology)
P.K. University, Shivpuri (MP)

EVALUATION SCHEME

SEMESTER I						
		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DCS-101	Foundation Communication	30	70	NA	NA	150
DCS-102	Applied Mathematics-I(A)	30	70	25	25	100
DCS-103	Applied Physics	30	70	25	25	150
DCS-104	Applied Chemistry	30	70	25	25	150
DCS-105	Elements of Electrical Engg. & Engg Mechanics	30	70	25	25	150
SEMESTER II						
		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DCS-201	Applied Mathematics-I(B)	30	70	NA	NA	100
DCS-202	Applied Physics-II	30	70	25	25	150
DCS-203	Fundamental of Electronic Devices	30	70	25	25	150
DCS-204	Concept of Programming using C	30	70	25	25	150
DCS-205	Basics of Information Technology	30	70	25	25	150

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I Year I Semester

DCS-101: FOUNDATIONAL COMMUNICATION

SECTION "A" (ENGLISH)

DETAILED CONTENTS

1. PARTS OF SPEECH :

- a. Noun
- b. The pronoun: Kinds and Usage
- c. The adjective: Kinds and Degree
- d. Determiner: Articles
- e. The verb: Kinds
- f. The Adverb: Kinds, Degree and Usage
- g. Prepositions
- h. Conjunctions
- i. The Interjections
- j. Subject: Verb Agreement (Concord)

2. VOCABULARY BUILDING :

- a. Antonyms and Synonyms
- b. Homophones
- c. One word substitutions
- d. Idioms and Phrases
- e. Abbreviations

3. Grammar

- a. Sentence & its types
- a. Tenses
- b. Punctuations
- c. Active and Passive voice
- d. Transformation of Sentences
- e. Synthesis of Sentences
- f. Direct and Indirect Narrations

4. DEVELOPMENT OF EXPRESSION (Composition) :

- a. Paragraph Writing
- b. Essay Writing
- c. Proposal Writing
- d. Letter Writing (Formal, Informal, Business, official etc.)
- f. Report Writing
- g. Note Making
- h. News Making

- i. Application Writing
- j. Minute Writing
- k. Invitation Letter Writing

SECTION "B" (Hindi)

- 5- संज्ञा, सर्वनाम, विशेषण, क्रियाविशेषण, वर्णसमास, संधि, अलंकार, रस, उपसर्गप्रत्यय।
- 6- पत्र लेखन, निविदासंविदा, दरआमंत्रण (कोटेशन)अपील, स्वतन्त्र अभिव्यक्ति, प्रतिवेदनलेखन, प्रेसविज्ञप्ति।
- 7- वाक्य/वाक्यांश के लिए ाब्द, पर्यायवाची या समानार्थी ाब्द, विलोम ाब्द, अनेकार्थी ाब्द, ाब्दयुग्म या समुच्चरित ाब्दसमूह, वाक्य शुद्धि (शुद्ध अशुद्ध वाक्य), मुहावरे एवंलोकोक्तियाँ ।

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DCS-102: APPLIED MATHEMATICS I(A)

1. ALGEBRA-I:

1.1 Series : AP and GP; Sum, nth term, Mean

1.2 Binomial theorem for positive, negative and fractional index (without proof). Application of Binomial theorem.

1.3 Determinants : Elementary properties of determinant of order 2 and 3, Multiplication system of algebraic equation, Consistency of equation, Cramer's rule

2. ALGEBRA-II:

2.1 Vector algebra : Dot and Cross product, Scaler and vector, triple product.

2.2 Complex number : Complex numbers, Representation, Modulus and amplitude, Demoivre theorem, its application in solving algebraic equations, Mod. function and its properties..

3. TRIGONOMETRY :

3.1 Relation between sides and angles of a triangle : Statement of various formulae showing relationship between sides and angle of a triangle.

3.2 Inverse circular functions : Simple case only

4. DIFFERENTIAL CALCULUS - I :

4.1 Functions, limits, continuity, - functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability.

4.2 Methods of finding derivative, - Function of a function, Logarithmic differentiation, Differentiation of implicit functions.

5. DIFFERENTIAL CALCULUS -II :

5.1 Higher order derivatives, Leibnitz theorem.

5.2 Special functions (Exponential, Logarithmic, Inverse circular and function), Definition, Graphs, range and Domain and Derivations of each of these functions.

5.3 Application - Finding Tangents, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, velocity, Acceleration, Errors and approximation.

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DCS-103: APPLIED PHYSICS-I

1. UNITS AND DIMENSIONS (4 MARKS)

S.I. Units & Dimensions of physical quantities, Dimensional formula and dimensional equation. Principle of homogeneity of dimensions and applications of homogeneity principle to: (i) Checking the correctness of physical equations, (ii) Deriving relations among various physical quantities, (iii) Conversion of numerical values of physical quantities From one system of units into another. Limitations of dimensional analysis.

2. ERRORS AND MEASUREMENT (4 Marks)

Errors in measurements, accuracy and precision, random and systematic errors, estimation of probable errors in the results of measurement (Combination of errors in addition, subtraction, multiplication and powers). Significant figures, and order of accuracy in respect to instruments,

3. CIRCULAR MOTION (5 MARKS)

Central forces. Uniform Circular motion (Horizontal and Vertical cases), angular velocity, angular acceleration and centripetal acceleration. Relationship between linear and angular velocity and acceleration. Centripetal and centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge.

4. MOTION OF PLANETS AND SATELLITES :(5 Marks)

Gravitational force, Acceleration due to gravity and its variation w.r. to height and depth from earth, Kepler's Law, Escape and orbital velocity, Time period of satellite, Geo- stationary, Polar satellites.

5. DYNAMICS OF RIGID BODY (ROTATIONAL MOTION) (6 MARKS)

Rigid body, Rotational motion, Moment of inertia, Theorems (Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies (Lamina, Sphere, Disc, Cylindrical), Concept of Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling of sphere on the slant plane. Concept of Fly wheel.

6. FLUID MECHANICS :(5 MARKS)

Surface tension, Capillary action and determination of surface tension from capillary rise method, Equation of continuity ($A_1V_1=A_2V_2$), Bernoulli's theorem, and its application stream line and Turbulent flow, Reynold's number.

7. FRICTION :(4 MARKS)

Introduction, Physical significance of friction, Advantage and disadvantage of friction and its role in every day life. Coefficients of static and dynamic friction and their measurements. viscosity, coeff. of viscosity, & its determination by stoke's method.

8. HARMONIC MOTION (6 MARKS)

Periodic Motion ,characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of its periodic time. Energy conservation in S.H.M.. Concept of phase, phase difference, Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

9. HEAT & THERMODYNAMICS: (6 MARKS)

Modes of heat transfer (Conduction, Convection and Radiation), coefficient of thermal conductivity Isothermal and adiabatic process. Zeroth First, Second Law of Thermodynamics and Carnot cycle, Heat Engine (Concept Only).

10. ACOUSTICS (5 MARKS)

Definition of pitch, loudness, quality and intensity of sound waves. Echo, reverberation and reverberation time. Sabine's formula without Derivation. Control of reverberation time (problems on reverberation time). Acoustics of building defects and remedy.

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DCS-104:APPLIED CHEMISTRY

1. ATOMIC STRUCTURE :

Basic concept of atomic structure, Matter wave concept, Quantum number, Heisenberg's Uncertainty Principle, Shapes of orbitals.

2. CHEMICAL BONDING :

Covalent bond, Ionic & Co-ordinate, Hydrogen bonding, Valence bond theory, Hybridisation, VSEPR theory, Molecular orbital theory.

3. CLASSIFICATION OF ELEMENTS :

Modern classification of elements (s,p,d and f block elements), Periodic properties : Ionisation potential, electronegativity, Electron affinity.

4. ELECTRO CHEMISTRY-I:

Arrhenius Theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of Acid and bases : Bronsted, Arrhenius and Lewis theory. Concept of pH and numericals. Buffer solutions, Indicators, Solubility product, Common ion effect with their application,

5. ELECTRO CHEMISTRY-II:

Redox reactions, Electrode potential(Nernst Equation), Electro-chemical cell (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electrochemical series and its application. Chemical and Electrochemical theory of corrosion, Galvanic Series. Prevention of corrosion by various method.

6. CHEMICAL KINETICS :

Law of mass action, order and molecularity of reaction. Activation energy, rate constants, 1st order reactions and 2nd order reactions.

7. CATALYSIS :

Definition Characteristics of catalytic reactions, Catalytic promoters and poison, Autocatalysis and Negative catalysis, Theory of catalysis, Application.

8. SOLID STATE :

Types of solids (Amorphous and Crystalline), Classification (Molecular, Ionic, Covalent, Metallic), Band theory of solids (Conductors, Semiconductors and Insulators), types of Crystals, FCC, BCC, Crystal imperfection.

9. **FUELS :**

Definition, its classification, high & low Calorific value. Determination of calorific value of solid and liquid fuels by Bomb calorimeter.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Diesel and Petrol), Benzol and Power alcohol. Knocking, Anti-knocking agents, Octane number and Cetane number. Cracking and its type, Gasoling from hydrogenation of coal (Bergius process and Fischer tropesch's process)

Gaseous Fuel - Coal gas, Oil gas, Water gas, Producer gas, Bio gas, LPG and CNG.

Numerical Problems based on topics

10. **WATER TREATMENT :**

Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sods lime, Zeolote and Ion exchange resin process). Disadvantage of hard water in different industries, scale and sludge formation, Corrosion, Caustic embrittlement, primming and foarming in biolers.

Disinfecting of Water By Chloramine-T, Ozone and Chlorine. Advantage and disadvantage of chlorinational, Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Numerical Problems based on topics.

11. **COLLOIDAL STATE OF MATTER :**

Concept of collidal and its types, Different system of colloids, Dispersed phase and dispersion medium. Methods of preparation of colloidal solutions, Dialysis andelectrodialysis. Properties of colloidal solution with special reference to absorption, Brownian Movement, tyndal effect, Electro phoresis and coagulation. relative stability of hydrophillic and hydrophobie colloids. Protection andprotective colloids. Emulsion, Types, preparation,properties and uses. Application of colloids chemistry in different industries.

12. **LUBRICANTS :**

Definition, classification, Necessasity and various kinds of lubricants. Function and mechanism of action of lubricants and examples. Properties of lubricants, Importance of additive compunds in lubricants, Synthetic lubricants and cutting fluids. Industrial application, its function in bearing.

13. **HYDROCARBONS:**

A. Classification andIUPACnomeuclature of organic compounds hamologous series (Functional Group)

B. Preparation, properties and uses of Ethane, Ethene, Ethyne (Acetylene), Benzene and Toluene.

14. **ORGANIC REACTIONS & MECHANISM:**

1. Fundamental auspects -

A. Electrophiles and nucleophiles, Reaction Intermediates, Free radical, Carbocation, Carbanion

B. Inductive effect, Mesomeric effect, Electromeric effect.

- 2.A. Mechanism of addition reaction (Markonicove's Rule, Cyanohydrin and Peroxide effect),
B. Mechanism of Substitution reactions; (Nucleophilic) hydrolysis of alkyl halide, electrophilic substitution halogenation, Sulphonation, Nitration and Friedel-Craft reaction.
C. Mechanism of Elimination reaction - Dehydration of primary alcohol, Dehydrohalogenation of primary alkyl halide.

15. POLYMERS :

1. Polymers and their classification. Average degree of polymerisation, Average molecular weight, Free radical polymerisation (Mechanisms)
2. Thermosetting and Thermoplastic resin -

A. Addition polymers and their industrial application- Polystyrene, PVA, PVC, PAN, PMMA, Buna-S, Buna-N, Teflon.

B. Condensation polymer and their industrial application :
Nylon 6, Nylon 6,6, Bakelite, Melamine formaldehyde, Urea formaldehyde, Terylene or Decron, Polyurethanes.

3. General concept of Bio polymers, Biodegradable polymers and inorganic polymers(Silicon)

16. SYNTHETIC MATERIALS :

- A. Introduction - Fats and Oils
B. Saponification of fats and oils , Manufacturing of soap.
C. Synthetic detergents, types of detergents and its manufacturing.
3. EXPLOSIVES: TNT, RDX, Dynamite.
4. Paint and Varnish

LIST OF PRACTICALS

1. To analyse inorganic mixture for two acid and basic radicals from following radicals

A. Basic Radicals :

NH_4^+ , Pb^{2+} , Cu^{2+} , Bi^{3+} , Cd^{2+} , As^{3+} , Sb^{3+} ,

Sn^{2+} , Al^{3+} , Fe^{3+} , Cr^{3+} , Mn^{2+} , Zn^{2+} , Co^{2+}

Ni^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+}

B. Acid Radicals :

CO_3^{2-} , S^{2-} , SO_3^{2-} , CH_3COO^- , NO_2^- ,

NO_3^- , Cl^- , Br^- , I^- , SO_4^{2-}

2. To determine the percentage of available Chlorine in the supplied sample of Bleaching powder.

3. To determine the total hardness of water sample in terms of CaCO_3 by EDTA titration method using Eriochroma black-T indicator.
4. To determine the strength of given HCl solution by titration against NaOH solution using Phenolphthalein as indicator.
5. To determine the Chloride content in supplied water sample by using Mohr's methods.
6. Determination of temporary hardness of water sample by O-Henry's method.

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I Year I Semester

DCS- 105 ELEMENT OF ELECTRICAL ENGG. & ENGG MECHANICS

1. Classification

Classification of materials into conducting, Semiconducting and insulating materials with reference to their atomic structure.

2. Conducting Materials

- (i) Resistivity and factors affecting resistivity, such as temperature, alloying and Electrical stressing.
- (ii) Super conductivity and super conducting material.
- (iii) Low resistivity materials e.g. Copper, aluminum and steel, their general Properties as conductor e.g. resistivity, temperature co-efficient, mechanical Properties, corrosion, solar ability, contact resistance and practical Application Uses of mercury as conducting material.
- (iv) Comparison of copper, aluminums and steel for various applications as Electrical conductor.
- (v) Low resistivity copper alloys: brass, bronze (cadmium and beryllium), their Practical application.
- (vi) High resistivity materials: managanese, constantan nichrome, carbon, tungsten, Their practical applications.
- (vii) Electric lamp materials.
- (viii) Brush contact materials.
- (ix) Soldering materials.
- (x) Thermocouple materials, Fuse materials.

3. Insulating Materials

- (i) Introduction.
- (ii) Properties of insulating material.
 - **Electrical properties:** Volume resistivity, Surface resistivity, Dielectric Loss, Dielectric Constant, Dielectric strength.
 - **Mechanical properties:-** Mechanical strength
 - **Physical properties :-** Hygroscopicity tensile and compressive strength, Abrasive resistance brittleness.

- **Thermal properties** - Heat resistance, Classification according to high permissible temperature rise, Effect of over loading on the life of an electrical appliances, Increase in rating with the use of insulating materials having higher thermal stability, Thermal conductivity.
- **Chemical properties**- Solubility, Chemical resistance, Weather ability.

(iii) Insulating materials and their application-

- Definition and classification
- Thermo setting materials e.g. Phenol Formaldehyde, Resins (i.e. Bakelite), Amino resins (Urea Formaldehyde and Melamine formaldehyde), Epoxy resins their properties, Applications and Commercial names.
- Thermo Plastic materials e.g. Polyvinyl Chloride (P.V.C.), Polyethylene Silicons their properties application and commercial names. Brief description of extrusion and moulding process of using plastic materials in electrical engineering.
- Natural Insulating Materials- Mica and Mica products, Asbestos and Asbestos products, Ceramic materials (Porcelain and Stealite), Glass and glass products, Cotton, Silk, Jute, Paper (Dry and impregnated), Rubber Butuman, Mineral and insulating oil for transformer, switch gear, capacitors, high voltage cables, insulating varnishes for coating and impregnation, Enamels for winding wires, Glass fibre sleeves
- Gasous Materials e.g. Air, Hydrogen, Nitrogen and SF6

4. **Magnetic Materials :**

- (i) Classification of magnetic materials into soft and hard magnetic materials.
- (ii) Soft magnetic materials - high silicon alloy steel for transformers and low silicon alloy steel, for electric rotating machine cold rolled grain oriented and non-oriented steel, Nickel iron alloy, soft ferrites, their properties and uses.
- (iii) Hard magnetic materials - tungsten steel, chrome steel, cobalt steel, alnico, hard ferrites, their properties and applications.

5. **Semiconductor Materials**

Introduction, semiconductor and their applications, Different semiconductor materials used in manufacturing various semiconductor (Si & Ge), Material used for electronic components like resistor, capacitor, diode, transistors and inductors.

6. **Special Purpose Materials :**

Materials used in transistor and IC manufacturing, PC BS, computer memory devices (name of such materials to be added)
Ferrous and non ferrous materials.
Thermistor, Sensistor, Varistor and their practical Application.

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I Year II Semester

DCS-201 APPLIED MATHEMATICS II

1. INTEGRAL CALCULUS - I:

Methods of Indefinite Integration :-

- 1.1 Integration by substitution.
- 1.2 Integration by rational function.
- 1.3 Integration by partial fraction.
- 1.4 Integration by parts.

2. INTEGRAL CALCULUS -II :

- 2.1 Meaning and properties of definite integrals, Evaluation of definite integrals. Integration of special function.
- 2.2 Application : Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution, centre of mean of plane areas.
- 2.3 Simposns 1/3rd and Simposns3/8th rule and Trapezoidal Rule : their application in simple cases.

3. CO-ORDINATE GEOMETRY (2 DIMENSION):

- 3.1 CIRCLE : Equation of circle in standard form. Centre - Radius form, Diameter form, Two intercept form.
- 3.2 Standard form and simple properties
Parabola $x^2=4ay, y^2=4ax,$
Ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
Hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

4. CO-ORDINATE GEOMETRY (3 DIMENSION):

- 4.1 Straight lines and planes in space -
Distance between two points in space, direction cosine and direction ratios, Finding equation of a straight line and Plane (Different Forms),
- 4.2 Sphere $x^2 + y^2 + z^2 + 2gx + 2fy + 2wz = d$ (Radius, Centre and General Equation)

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I Year II Semester

DCS-202 APPLIED PHYSICS-II

1. Optics :

Nature of light, Laws of Reflection and Refraction, Snell's Law, Interference (Constructive and Destructive), Diffraction and Polarization (Concept Only), Law of Malus and Polaroid's.

1. Introduction To Fibre Optics :

Critical angle, Total internal reflection, Principle of fiber optics, Optical fiber, Pulse dispersion in step-index fibers, Graded index fiber, Single mode fiber, Optical sensor.

3. Lasers and its Applications :

Absorption and Emission of energy by atom, Spontaneous and Stimulated Emission, Population inversion, Main component of laser and types of laser- Ruby Laser, He-Ne laser and their applications. Introduction to MASER.

4. Electrostatics :

Coulomb's Law, Electric field, Electric potential, Potential energy, Capacitor, Energy of a charged capacitor, Effect of dielectric on capacitors.

5. D.C. Circuits :

Ohm's Law, Kirchoff's Law and their simple application, Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); Carey Foster's bridge, potentiometer.

6. Magnetic Materials and Their Properties:

Dia, Para and Ferro-magnetism, Ferrites, Magnetic Hysteresis Curve and its utility. Basic idea of super conductivity, Meissner's effect.

7. Semiconductor Physics :

Concept of Energy bands in solids, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semi conductors, Electrons and holes as charge carriers in semiconductors, P-type and N-type semiconductors.

8. Junction Diode and Transister :

Majority and Minority charge carriers P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics, Formation of transistor, transistor-action, Base, emitter and collector currents and their relationship LED's.

9. Introduction To Digital Electronics :

Concept of binary numbers, Inter conversion from binary to decimal and decimal to binary. Concepts of Gates (AND, NOT, OR).

10. Non-conventional energy sources:

- (a) Wind energy : Introduction, scope and significance, measurement of wind velocity by anemometer, general principle of wind mill.
- (b) Solar energy: Solar radiation and potentiality of solar radiation in India, uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector.

PHYSICS LAB

Note: Any 4 experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.
2. Determination of 'g' by plotting a graph T^2 versus l and using the formula $g=4\pi^2/\text{Slope of the graph line}$
3. Determine the force constant of combination of springs incase of 1. Series 2. Parallel.
4. To verify the series and parallel combination of Resistances with the help of meter bridge.
5. To determine the velocity of sound with the help of resonance tube.
6. Determination of viscosity coefficient of a lubricant by Stoke's law.
7. Determination of E_1/E_2 of cells by potentiometer.
8. Determination of specific resistance by Carry Foster bridge.
9. Determination of resistivity by P.O.Box.
10. Verification of Kirchhoff's Law.
11. To draw Characteristics of p-n Junction diode.
12. To measure instantaneous and average wind velocity by indicating cup type anemometer/hand held anemometer.

NOTE :

Students should be asked to plot a graph in experiments (where possible) and graph should be used for calculation of results. Results should be given in significant figures only.

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DCS-203 Fundamental of Electronic Devices

1. Semiconductor Diodes

Semiconductor materials N type and P Type P.N. junction, its forward and reversed biasing; junction diode characteristics, static and dynamic resistances and their calculation from diode characteristics.

Diode (P-N junction) as , half wave, full wave rectifier including bridge rectifier, relationship between D.C. output voltage and A.C. input voltage, rectification efficiency and ripple factor for rectifier circuits, filter circuits, shunt capacitor, series inductor, capacitor input filter. Different types of diodes, brief idea of characteristics and typical applications of power diodes, zener diodes, varactor diodes, point contact diode, tunnel diodes, LEDs and photo diodes. Important specifications of rectifier diode and zener diode.

2. Bipolar Junction Transistor :

Concept of bipolar junction transistor as a two junction three terminal device having two kinds of charge carriers, PNP and NPN transistor, their symbols and mechanisms of current flow, explanation fundamental current relations. Concept of leakage current (I_{cbo}) effect of temperature on leakage current.

Standard notation for current and voltage polarity; CB, CE, and CC configurations. Transistor input and output characteristics, concept of active, cut off and saturation region.

Common emitter configuration: current relations in CE configuration, collector current in terms of base current and leakage current (I_{ceo}), relationship between the leakage current in CB and CE configuration, input and output characteristics, determination of dynamic input and output resistances and current amplification factor from the characteristics.

3. Single Stage Transistor Amplifier

Single stage CE amplifier with proper biasing circuit and its working as voltage amplifier. AC load line and its use .

- (a) Explanation of phase reversal of the output voltage with respect to input voltage. Introduction to tuned voltage amplifier.

4. FIELD EFFECT TRANSISTOR (FET), MOSFET & CMOS

A. FET :

- Construction, operation, characteristics and Biasing of Junction FET.
- Analysis of Single stage CB, CG and CD amplifier. (Only Brief Idea)

B. MOSFET :

- Construction, operation, characteristics and Biasing of MOSFET in both depletion and enhancement modes.
- Analysis of Single stage CB, CG and CD amplifier. (Only Brief Idea)

C. CMOS :

- Construction, operation, characteristics of CMOS in both depletion and enhancement modes.
- Use of CMOS as Inverter, Different Application of CMOS, CMOS IC.
- Comparisons of JEET, MOSFET and Bipolar transistor.

5. MULTISTAGE & POWER AMPLIFIERS:

- 5.1 Need of multistage amplifier, different coupling schemes and their working, brief mention of application of each of the type of coupling.
- 5.2 Working of R.C. coupled and transformer coupled multistage amplifier, approximate calculation of voltage gain and frequency response for a two stage R-C coupled amplifier. Working principles of push pull amplifier circuits its advantages over single ended power amplifier.

6. Feedback in Amplifiers

Basic principles and types of feedback, derivation of expression for the gain of an amplifier employing feedback. Effect of

negative feedback on gain, stability, distortion, and band width.(only physical explanation) typical feedback circuits.

- (a) RC coupled amplifiers with emitter by-pass capacitor removed.
- (b) Emitter follower, complementary symmetry power amplifier and its applications.

7. Regulated Power Supply

- 7.1 Concept of regulation.
- 7.2 Basic regulator circuits (using zener diode).
- 7.3 Concept of series and shunt regulator circuits.
- 7.4 Three terminal voltage regulator ICs (positive negative and variable) application. Block diagram, Pin configuration and working of popular regulator IC.

8. OSCILLATORS:

- 8.1 Application of oscillators.
- 8.2 Use of positive feedback/negative resistance for generation of oscillation, barkhawn's criterion for oscillations.

ELECTRONICS- I LAB:

1. Semiconductor diode : identification of types of packages, terminals and noting different ratings using data books for various types of semiconductor diodes (germanium, point contact, silicon low power and high power and switching diode).
2. Rectifier circuits using semiconductor diode measurement of input and output voltage and plotting of input and output wave shapes:
 - i) Half wave rectifier
 - ii) Full wave rectifier (centre tapped and bridge rectifier circuits).
3. Plot the wave shapes of a full wave rectifier with shunt capacitor, series inductor, and filter circuit
4. Single stage common emitter amplifier circuit
 - i) Measurement of voltage gain at 1 KHZ for different load resistances.
 - ii) Plotting of frequency response of a single stage amplifier circuit.
 - iii) Measurement of input and output impedance of the amplifier circuit.
5. To measure the overall gain of two stage R.C coupled amplifier at 1 KHZ and note the effect of loading of second stage on the first stage.
6. (a) To plot the load Vs output power characteristic to determine the maximum signal input for undistorted signal output.
(b) The above experiment is to be performed with single ended power amplifier, transistorized push pull amplifier. Complementary symmetry power amplifier.
7. To observe the effect of a by-pass capacitor by measuring voltage gain and plotting frequency response for a single stage amplifier.
8. To measure input and output impedance of a feedback amplifier with and without by-pass capacitor.
9. Measurement of voltage gain, input and output impedance and plotting of frequency response of an emitter follower circuit.
10. Plot the FET characteristics and determination of its parameters from these characteristics.
11. To test adjustable IC regulator and current regulator.
12. Identification of Some Popular IC of 74 and 40 series with Pin Number and other details.
13. Application and use of Multimeter, CRO, Audio Oscillator and
14. Power Supply (D.C.)

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P.K. University, Shivpuri (MP)

I Year II Semester

DCS-204 CONCEPT OF PROGRAMMING USING C

UNIT 1:

Basics of Computer: Introduction to digital computer, basic operations of computer, functional components of computer, Classification of computers.

Introduction to operating system: [DOS, windows, linux and android] purpose, function, services and types,

Number system: Binary, octal and hexadecimal number systems, their mutual conversions, Binary arithmetic.

Basics of programming: approaches to Problem solving, concept of algorithm and flow charts, types of computer languages: Machine language, assembly language and high level language,

concept of assembler, compiler, loader and linker.

UNIT 2:

Standard I/O in “C”, **Fundamental Data Types and Storage Classes:** Character types, Integer, short, long, unsigned, single and double precision floating point, storage classes, automatic, register, static and external, **Operators and Expressions:** Using numeric and relational operators, mixed operands and type conversion, Logical operators, Bit operations, Operator precedence and associativity,

UNIT 3:

Conditional Program Execution: Applying if and switch statements, nesting if and else, restrictions on switch values, use of break and default with switch, **Program Loops and Iteration:** Uses of while, do and for loops, multiple loop variables, assignment operators, using break and continue, **Modular Programming:** Passing arguments by value, scope rules and global variables, separate compilation, and linkage, building your own modules. **Arrays:** Array notation and representation, manipulating array elements, using multidimensional arrays, arrays of unknown or varying size,

UNIT 4:

Arrays: Array notation and representation, manipulating array elements, using multidimensional arrays. Structure, union, enumerated data types, **Functions:** introduction, types of functions, functions with array, recursive functions, **Pointers:** introduction, declaration, applications File handling, standard C preprocessors, defining and calling macros, conditional compilation, passing values to the compiler.

UNIT 5:

Concept of OOP: Abstraction, Encapsulation, Inheritance, and Polymorphism in C++.

Text Books:

1. Computer Concepts and Programming in C by Vikas Gupta, Wiley India Publication
2. Computer Concepts and Programming by Anami, Angadi and Manvi, PHI Publication
3. C programming by Kernighan and Ritchie, PHI
4. Computer Fundamentals and Programming in C. Reema Thareja, Oxford Publication
5. Computer Concepts and Programming in C, E Balaguru swami, McGraw Hill
6. Computer Concepts and Programming in C by D.S. Yadav and Rajeev Khanna, New Age International Publication
7. Programming in C A Practical approach by Ajay Mittal, Pearson Publication
8. Computer Fundamentals and C programming by KK Gupta, Acme Learning Publication

**Department of Computer Science Engineering &IT
(Faculty of Engineering and Technology)**

P.K. University, Shivpuri (MP)

I Year II Semester

DCS-205 BASIC OF INFORMATION TECHNOLOGY

UNIT 1 –

Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers-Analog, Digital, Hybrid, General, Special Purpose, Micro, Mini, Mainframe, Super, Basic components of a computer system - Control unit, ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

Data representation and codes, Decimal, Binary, Octal and Hexadecimal System and inter conversion, BCD numbers and ASCII codes.

UNIT 2-

Computer hardware, Input devices- Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Output devices- Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced,

, PRINTERS - DAISY WHEEL, DOT MATRIX, INKJET, LASER, LINE PRINTER, PLOTTER, SOUND CARD AND SPEAKERS , MEMORY DEVICES, RAM, ROM, MASS STORAGE DEVICES, CD-ROM, FLASH MEMORY AND THEIR CHARACTERISTICS AND USES.

UNIT 3-

System software - Assemblers, Translators, Interpreters, Compilers, Operating Systems - Functions, Types- Batch, Single, Multiprogramming, Languages : High level languages, Procedural and Object Oriented languages. Application Software – Word Processing, Spreadsheet, Presentation Graphics, Data Base Management Software.

UNIT 4-

Computer networking: Goals and applications, LAN, MAN, WAN, COMPUTER COMMUNICATION.: COMMUNICATION MODES : SIMPLEX, HALF DUPLEX, FULL DUPLEX. TYPES OF NETWORK - LAN, WAN, MAN ETC., TOPOLOGIES OF LAN - RING, BUS, STAR, AND TREE TOPOLOGIES, COMPONENTS OF LAN -MEDIA, BRIDGES, HUB, ROUTERS, REPEATER AND GATEWAYS, COMMUNICATION CHANNELS - TWISTED, COAXIAL, FIBER OPTIC, MODEM - CHARACTERISTICS,.

UNIT 5-

what is – Desktop, Cluster, Grid, and Cloud computing, why cloud computing, Challenges and opportunities, cloud computing three basic services- SAAS, PAAS, IAAS. Concept of Big Data , Difference Between Big Data and Small Data , 3V Characteristics - Volume , Velocity , Variety. Different Types of Big Data. -Structured Big Data, Un Structured Big Data, Semi Structured Big Data ,

Faculty of Engineering and Technology

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Evaluation Scheme & Syllabus for

Department of Computer Science Engineering & IT

DIPLOMA II YEAR

(III & IV Semester)

(Effective from session 2019-20)

Department of Computer Science Engineering & IT

Department of Computer Science Engineering &IT
(Faculty of Engineering and Technology)
P.K. University, Shivpuri (MP)

EVALUATION SCHEME

SEMESTER III						
SUBJECT CODE	SUBJECT NAME	THEORY		PRACTICAL		TOTAL
		SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DCS-301	Applied Mathematics-III	30	70	NA	NA	100
DCS-302	Data Structure using C	30	70	25	25	150
DCS-303	Web Technology-I	30	70	25	25	150
DCS-304	Microprocessor & Its Application	30	70	25	25	150
DCS-305	Office Automation Tools	30	70	25	25	150
SEMESTER IV						
SUBJECT CODE	SUBJECT NAME	THEORY		PRACTICAL		TOTAL
		SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DCS-401	Data Communication & Computer Network	30	70	NA	NA	100
DCS-402	Web Technology-II	30	70	25	25	150
DCS-403	Operating System	30	70	25	25	150
DCS-404	Computer Hardware And Maintenance (Practical)	NA	NA	25	25	50

Department of Computer Science Engineering &IT
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P.K. University, Shivpuri (MP)
II Year III Semester
DCS- 301: APPLIED MATHEMATICS II

DETAILED CONTENTS

UNIT-1 MATRICES :

- 1.1 Algebra of Matrices, Inverse : Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Symmetric, Skew symmetric, Hermitian, Skew hermit ion, Orthogonal, Unitary, diagonal and Triangular matrix, Determinant of a matrix. Definition and Computation of inverse of a matrix.
- 1.2 Elementary Row/Column Transformation :Meaning and use in computing inverse and Rank of a matrix.
- 1.3 Linear Dependence, Rank of a Matrix :Linear dependence/independence of vectors, Definition and computation of a rank of matrix. Computing rank through determinants, Elementary row transformation and through the concept of a set of independent vectors, Consistency of equations.
- 1.4 Eigen Pairs, Cayley-Hamilton Theorem :Definition and evaluation of eign values and eign vectors of a matrix of order two and three, Cayley-Hamilton theorem (without Proof) and its verification, Use in finding inverse and powers of a matrix.

UNIT-II DIFFERENTIAL CALCULUS :

- 2.1Function of two variables, identification of surfaces in space, conchoids
- 2.2Partial Differentiation : Directional derivative, Gradient, Use of gradient f, Partial derivatives, Chain rule, Higher order derivatives, Eules theorem for homogeneous functions, Jacobians.
- 2.3Vector Calculus :Vector function, Introduction to double and triple integral, differentiation and integration of vector functions, gradient, divergence and curl, differential derivatives.

UNIT -III DIFFERENTIAL EQUATION:

- 3.1 Formation, Order, Degree, Types, Solution :Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree of a differential equation, Linear, Nonlinear equation.

3.2 First Order Equations: Variable separable, equations reducible to separable forms, Homogeneous equations, equations reducible to homogeneous forms, Linear and Bernoulli form exact equation and their solutions.

3.3 Higher Order Linear Equation :Property of solution, Linear differential equation with constant coefficients (PI for $X=e^{ax}$, $\sin ax$, $\cos ax$, X^n , $e^{ax}V$, XV).

3.4 Simple Applications : LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping effect. Equivalence of electrical and mechanical system

UNIT-IV INTEGRAL CALCULUS - II:

4.1 Beta and Gamma Functions: Definition, Use, Relation between the two, their use in evaluating integrals.

4.2 Fourier Series: Fourier series of $f(x)$, $-n < x < n$, Odd and even function, Half range series.

4.3 Laplace Transform : Definition, Basic theorem and properties, Unit step and Periodic functions, inverse Laplace transform, Solution of ordinary differential equations.

UNIT- V PROBABILITY AND STATISTICS :

5.1 Probability: Introduction, Addition and Multiplication theorem and simple problem.

5.2 Distribution: Discrete and continuous distribution, Binomial Distribution, Poisson Distribution, Normal Distribution..

Department of Computer Science Engineering & IT

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II Year III Semester
DCS-302: Data Structure Using C

DETAILED CONTENTS

UNIT I-

BASIC CONCEPTS: Basic concepts and notation & Mathematical background

UNIT-II

Stacks And Queues Representation of stacks & queues, linked sequential.

UNIT-III

LISTS: List representation techniques, Multilinked structures, Dynamic storage allocation techniques.

UNIT-IV

SORTING ALGORITHMS : Insertion sorts, Bubble sort, Quick sort, Merge sort, Heap sort

UNIT V

Tables: - Searching sequential tables, Hash tables and Symbol tables,
Heap

UNIT VI

TREE: Definitions and basic concepts, Linked tree representations, binary tree traversal algorithms-trees and their applications

DCS-302 : DATA STRUCTURE USING C Lab

List of Experiments

1. Write a program on Linked List Using 'C' & C++.
2. Exercise on Stack, Queues. Using C & C++
3. Exercises on Sorting .

LIST OF BOOKS

1. Data Structure - Schaum's Outline Series - McGraw Hill
2. Data Structure - Schaum's Series - McGraw Hill Publications
3. Horwitz and SartajSahni - Data Structure
4. Tanenbaum - Data Structures - Prentice Hall of India, New Delhi
5. KanekarYashwant - Data Structure through C, BPB Publication

***Department of Computer Science Engineering & IT
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P.K. University, Shivpuri (MP)

II Year III Semester

DCS-303: WEB TECHNOLOGY – I

UNIT I

HTML : Elements of HTML, HTML sources and Rules of nesting, Syntax conventions, HTML categories, Text tags, Formatting Web Pages by using styles, Adding pictures, Image attribute, introduction to forms, tables and models, advantages and limitations of tables, frames, link, CSS cascading style sheets, XHTML, XML, Client side scripting, Server side scripting, Managing data with SQL.

UNIT II-

JAVA SCRIPTS: What is Java scripts, adding, Java scripts to documents, embedding Java scripts, Linking Java scripts, Creating a page program with scripts, What is Java and its applets to make webpage run server scripts, active X.

UNIT-III

XML : Introduction to XML, Difference between XML and HTML, Use of XML, XML Syntax Rules, XML Elements, XML attribute, XML name space, Displaying XML, XML validator, XML application, RSS FEED,JSON.

UNIT IV :

CSS Introduction, CSS Syntax, CSS selectors : Elements Selector, id Selector, Class Selector, Grouping Selectors, Implementing CSS, Query, Image Format (JPG, PNG, GIF).

UNIT V

DHTML :DHTML Introduction, DHTML - JAVA Script, DHTML - HTML DOM, DHTML - HTML Events, DHTML - CSS.

LIST OF PRACTICALS

1. Exercises on to static web sites.
2. Development of different web sites using open source tools

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II Year III Semester

DCS-304: MICROPROCESSORS AND APPLICATIONS

UNIT-1

OVERVIEW OF MICROCOMPUTERS SYSTEM:

1.1 Functional block.

- (a) CPU.
- (b) Memory.
- (c) Input/Out devices (Key board, Floppy drive, Harddisk drive, Tape drive, VDU, Printer, Plotter).

1.2 Concept of programmed and data memory.

- (a) Registers (general purpose).
- (b) external memory for storing data and results.

1.3 Data transfer between registers.

1.4 Concept of tristate bus.

1.5 Control on registers.

UNIT II

MEMORY OF A MICROCOMPUTER:

Concept of byte organised memory.

- (a) Address inputs.
- (b) Address space.
- (c) Data input/output.

2.2 Addressing and Address decoding.

- (a) Memory system organization.
- (b) Partitioning of total memory space into small blocks.

(c) Bus contention and how to avoid it.

2.3 Memory chips.

(a) Types of ROM, RAM, EPROM, PROM.

(b) Read/Write inputs.

(c) Chip enable/select input.

(d) Other control input/output signals.

- Address latching.

- Read output.

- Address strobes.

(f) Power supply inputs.

2.4 Extension of memory.

- In terms of word length and depth.

UNIT III-

C P U & CONTROL:

3.1 General microprocessor architecture.

3.1 Instruction pointer and instruction register.

3.2 Instruction format.

- Machine and Mnemonics codes.

- Machine and Assembly language.

3.3 Instruction decoder and control action.

3.4 Use of Arithmetic Logic Unit.

- Accumulator.

- Temporary Register.

Flag flip-flop to indicate overflow, underflow, zero result occurrence.

3.5 Timing and control circuit.

- Crystal and frequency range for CPU operation.

- Control bus to control peripherals.

UNIT IV

INTRODUCTION OF 8085 MICROPROCESSOR:

Evolution of Microprocessor, Register Structure, ALU, BUS Organization, Timing and Control.

5. INTRODUCTION OF 8086 MICROPROCESSOR:

Internal organization of 8086, Bus Interface Unit, Execution Unit, Unit, register, Organization, Sequential Memory Organization, Bus Cycle.

6. ASSEMBLY LANGUAGE PROGRAMMING :

Addressing Modes, Data Transfer, Instructions, Arithmetic and Logic Instruction, Program Control Instructions (Jumps, Conditional Jumps, Subroutine Call) Loop and String Instructions, Assembler Directives.

UNIT V

BASIC I/O INTERFACING :

Programmed I/O, Interrupt Driven I/O, DMA, Parallel I/O (8255-PPI, Getronics Parallel Port), Serial I/O (8251/8250, RS-232 Standard), 8259-Programmable Interrupt Controller, 8237-DMA Controller, 8253/8254-Programmable Timer/Counter, A/D and D/A conversion.

8. MEMORY INTERFACING :

Types of Memory, RAM and ROM Interfacing with Timing Considerations, DRAM Interfacing.

9. ADVANCE MICROPROCESSOR AND MICRO CONTROLLERS : Brief idea of Microcontroller 8051, Pentium and Power PC

LIST OF BOOKS

1. Singh, B. P. - Advanced Microprocessor and Microcontrollers- New Age International.
2. Singh, B. P. - Microprocessor Interfacing and Application - New Age International.
3. Brey, Barry B. - INTEL Microprocessor - Prentice Hall (India)-4th Edition.
4. Liu and Gibson G.A. - Microcomputer System - The 8086/8088 Family-Prentice Hall (India) 2nd Edition.
5. Sombir Singh - Microprocessor and Its Application - Jai Prakesh Publication, Meerut

DCS-304 :MICROPROCESSORS AND APPLICATIONS LAB

List Of Practical's

1. Assembly language programming :- Programming of simple problems.
2. Simple programming problems using 8085 and 8086 microprocessor.
Trainer kit to gain competence in the use of
 - (a) 8085 and 8086 Instruction set.
 - (b) Support chips of 8085 and 8086.

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II Year III Semester

DCS-305: OFFICE AUTOMATION TOOLS

UNIT I :

WORD PROCESSING:

File : Open, Close, Save and Find File, Print and Page Setup

Edit : Cut, Copy, Find, Replace

Insert: Page Insert, Page No., Symbol

Font : Paragraph, Tabs, Bold & Shading, Change Case

Tools : Spelling, Mail Merge

Table : Insert Table, Delete Cells, Merge Cell, Sort Text

UNIT II-

SPREADSHEET:

File : Open, Close, Save and Find File, Print and Page Setup

Edit : Cut, Copy, Find, Replace, Undo, Redo

Insert: Cell, Row, Worksheet, Chart Format: Data, Sort, Filter, Form, Table

UNIT III-

PRESENTATION

File : New, Open, Close, Save as HTML, Pack and Go, Page setup, Send to, Properties

Edit : Cut, Copy, Find, Replace, Undo, Redo, Duplicate.

View : Slide Outline, Slide sorter, Notepad, Slideshow, Master, Black & white slide, Toolbars, Ruler, Guides

Insert : New slide, Duplicate slide, Picture, Textbox, Movies & sound, Hyperlink.

Format : Font, Bullet, Alignment, Linespacing, Slide layout.

Tool : Power point, Presentation & conference, Expand slide, Macro, customise.

Slide show: View show, Rehearse timing, Narration, View on two screen, Active buttons, Preset Animation, Custom - animation, Slide transition.

Window : New window, Arrange icons, Fit to page, Cascade.

UNIT IV

Electronic Mail :

- Composing an Email Message
- Working with Address Book
- Automatically Add contents to Your Address Book
- Reading Email using Outlook Express

- Reading a message
- Checking for New Messages
- Reading file Attachment
- Taking Acting on a Messages
- Web Based Email
- Advantage os using Web Based Email.

List Of Practical's

1. Create a document using function :Saves, Page Number, Bullets and Numbering.
2. Create a document using styles and formatting option
3. Create a document using different fonts.
4. Create a document using the function page setup and page preview, then print that document.
5. Create a table and perform operation in it.
6. Create a table, chart in excel and implement all formula as addition, subtraction, multiplication and division.
7. How to use mail merge in MS Word.
8. Create a Power Point presentation using slide designing.
9. Create, Save and Print the Power Point Presentation.
10. Create a Power Point Presentation using Clipart, Word Art Gallery and then add transition and animation effect.

LIST OF BOOKS

1. Microsoft Office 2010 For Dummies By Wallace Wang
2. 2007 Microsoft Office System Plain & Simple by Jerry Joyce- Microsoft Press
3. Office XP : The Complete Reference- Stephen L. Selson - Tata McGraw Hill Education.
4. Working in Microsoft Office - Richard Mansfield - Tata McGraw Hill Education.

Department of Computer Science Engineering & IT
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II Year IV Semester

DCS -401: DATA COMMUNICATION AND COMPUTER NETWORKS

DETAILED CONTENTS

UNIT I

OVERVIEW OF DATA COMMUNICATION AND NETWORKING :

Introduction; Data Communication; Components, data representation (ASCII, ISO, etc.). Direction of data Flow (Simplex, Half duplex, Full duplex), Network; Distributed processing, Network criteria, Physical structure (Types of connection, Topology), Categories of network (LAN, MAN, WAN); Internet; Brief history, Internet today; Protocols and standards; Reference models; OSI reference model TCP/IP reference model, their comparative study.

UNIT II-

PHYSICAL LAYER :

Overview of data (Analog and Digital), Signal (Analog and Digital), Transmission (Analog and Digital) and Transmission media (Guided and Non-guided); TDM, FDM, WDM; Circuit switching; Time division and space division switch, TDM bus; Telephone network.

UNIT III-

DATA LINK LAYER :

Types of errors, Framing (Character and bit stuffing), Error detection and Correction methods; Flow control; Protocols Stop and wait ARQ, Go-Back, NARQ, Selective repeat ARQ, HDLC.

Medium Access Sub Layer : Point to point protocol, LCP, NCP, FDDI, Token bus, Token ring; Reservation, Polling, Concentration; Multiple access protocols, CSMA, CSMA/CD, FDMA, TDMA, CDMA; Traditional Ethernet, Fast Ethernet.

UNIT IV

NETWORK LAYER :

Internetworking and devices : Repeaters, Hubs, Bridges, Switches, Router, Gateway; Addressing : Internet address, Classful address, Subnetting; Routing : Techniques, Static vs. dynamic routing, Routing table for classful address; Routing algorithms: Shortest path algorithm, Flooding, Distance vector routing, Link state routing; Protocols ARP, RARP, IP, ICMP, IPV6; Unicast and multicast routing protocols.

UNIT V-

TRANSPORT LAYER :

Process to process delivery; UDP, TCP; Congestion control algorithm; Leaky bucket algorithm, Token bucket algorithm, Choke packets; Quality of service; Techniques to improve Qos.

UNIT VI

EMERGING TECHNOLOGIES IN NETWORKING:

ISDN services and ATM; DSK technology, Cable modem, Sonnet wireless LAN: IEEE 802.11; Introduction to blue-tooth, VLAN's, Cellular telephony and Satellite network.

Text Books

1. B. A. Forouzan - Data Communication and Networking (3 Ed.) - TMH.
2. A. S. Tanenbaum - Computer Networks (4 Ed.) - Pearson Education/ PHI.
3. W. Stallings - Data and Computer Communication (5 Ed.) - Pearson Education/ PHI.

LIST OF PRACTICALS

1. Identification of various networks components
 - Connection, BNC, RJ-45, I/O box
 - Cables, Co-axial, twisted pair, UTP
 - NIC (Network Interface Card)
 - Switch, Hub
2. Sketch wiring diagram of network cabling considering a computer lab of 20 systems.
3. Interfacing with the network card (Ethernet)
4. Preparing of network cables.
5. Establishment of a LAN
6. Use of protocols in establishing LAN
7. Trouble shooting of networks.
8. Installation of network device drivers.
9. Installation of networks (Peer Networking client server interconnection).
10. Use/installation of proxy server.

**Department of Computer Science Engineering & IT
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II Year IV Semester

DCS-402: WEB TECHNOLOGY-II

UNIT I

JAVA SERVLET :

Introduction to Server Management (Using TOM Cat) Servlet introduction, working of servlet advantage of servlet, servlet terminology, introduction to servlet API, Servlet interface, Generics Servlet class, Http servlet class, Life cycle of a servlet.

UNIT II

JSP :

JSP introduction, JSP - Environment setup, JSP - Architecture, JSP- Life cycle, JSP-syntax, JSP-Directive, JSP-Actions, JSP- Implicit objects, JSP - Client request, JSP - Server response, JSP integration with database.

UNIT-III

AJAX : AJAX Introduction, XML Http, Request object, server response, AJAX events, Validation, Ingratiation with API

UNIT-IV

CROSS BROWSER COMPATIBILITY :

Introduction, Cross Browser compatibility issue, Fixing cross browser compatibility issue.

UNIT V-

SESSION AND COOKIES :

Introduction to session adn cookies, Session Management, Create and deletion of cookie with Java Script, Function to et a cookie, Function to get a cookie, Function to check and cookie.

LIST OF PRACTICALS

1. Exercises related to Java Servlet
2. Exercises related to JSP
3. Exercises related to ASP.
4. Exercises related to AJAX.
5. Exercises related to Cross Browser Compatibility.
6. Exercises related to Session and Cookies.

Department of Computer Science Engineering & IT
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II Year IV Semester

DCS-403 : OPERATING SYSTEM

DETAILED CONTENTS

UNIT I

Introduction: Evolution of Operating, Computer system overview, characteristics of operating system, GUI, CUI, Single user, Multi user operating system Time Sharing and Real Time System.

UNIT II

Management of Operating System :

A. Process Management - Process concept, Process schedule, Process Synchronization, Inter process communication, CPU scheduling and dead lock.

B. Memory Management - Main memory, Contiguous memory allocation, Segmentation, Paging, Virtual memory, Demand paging, Page replacement, Allocation, Threading.

UNIT III

. Input Output Management - Mass storage structure, Overview, Disk scheduling and Management. +

. File Management - File concepts, File system and structure, Directory structure.

UNIT IV

CASE STUDY :

Linux and Unix basic concepts, system administration requirement for Linux, System Administration

List Of Practical's

1. Practices on commands using Linux.
2. Practices on commands using Unix

LIST OF BOOKS

1. Milenekovie - Operating System Concept - McGraw Hill
2. Petersons - Operating System - Addison Wesley
3. Dietal - An Introduction To Operating System- Addison Wesley
4. Tannenbaum - Operating System Design and Implementation - PHI
5. Gary Nutt- Operating System, A Modern Perspective- Addison Wesley
6. Stalling, William - Operating System - Maxwell Macmillan
7. Silveschatza, Peterson J - Operating System Concepts - Willey

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II Year IV Semester

DCS-404 :COMPUTER HARDWARE & MAINTENANCE

HARDWARE MAINTENANCE

List Of Practical's

- (I) Study of devices on motherboard
 - (II) Study of Key board & Keyboard decoder
 - (III) Study of Video Adopter & display controllers
 - (IV) Study of Floppy Drive, CD Drive and Hard Disk.
 - (V) Study of Multifunction Input/output controllers
2. Troubleshooting & repair of following equipment
 - (I) Dot Matrix Printer, Laser, Inkjet Printer.
 - (II) Digital Plotter
 - (III) C. P. U.
 - (IV) Disk Drive
3. Study and Trouble Shooting of
 - (I) Network
 - (II) Power Supplies.

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Evaluation Scheme & Syllabus for

Department of Computer Science Engineering & IT

Diploma III YEAR

(V & VI Semester)

(Effective from session 2019-20)

Department of Computer Science Engineering & IT

Department of Computer Science Engineering &IT
(Faculty of Engineering and Technology)
P.K. University, Shivpuri (MP)

EVALUATION SCHEME

SEMESTER V						
		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DCS-501	Industrial Management & Entrepreneurship Dev.	30	70	25	25	150
DCS-502	Database Management System	30	70	NA	NA	100
DCS-503	Java programming	30	70	25	25	100
DCS-504	E-Commerce	30	70	NA	NA	100
SEMESTER VI						
		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DCS-601	Environmental Education & Disaster Mgmt.	30	70	NA	NA	100
DCS-602	Network Administration & Security	30	70	25	25	150
DCS-603	Project	30	70	25	25	150

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III Year V Semester

**DCS-501:INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP
DEVELOPMENT**

UNIT I

Principles of Management

- 1.1 Management, Different Functions: Planning, Organizing, Leading, Controlling.
 - 1.2 Organizational Structure, Types, Functions of different departments.
 - 1.3 Motivation: Factors, characteristics, methods of improving motivation, incentives, pay, promotion, rewards, job satisfaction, job enrichment.
 - 1.4 Need for leadership, Functions of a leader, Factors for accomplishing effective leadership, Manager as a leader, promoting team work.
- 2. Human Resource Development**
- 2.1 Introduction, objectives and functions of human resource development (HRD) department.
 - 2.2 Recruitment, methods of selection, training strategies and career development.
 - 2.3 Responsibilities of human resource management – policies and functions, selection – Mode of selection –Procedure – training of workers, Job evaluation and Merit rating.
- 3. Wages and Incentives**
- 3.1 Definition and factors affecting wages, methods of wage payment.
 - 3.2 Wage incentive – type of incentive, difference in wage, incentive And bonus; incentives of supervisor.
 - 3.3 Job evaluation and merit rating.
- 4. Human and Industrial Relations**
- 4.1 Industrial relations and disputes.
 - 4.2 Relations with subordinates, peers and superiors.
 - 4.3 Characteristics of group behavior and trade unionism.
 - 4.4 Mob psychology.
 - 4.5 Grievance, Handling of grievances.
 - 4.6 Agitations, strikes, Lockouts, Picketing and Gherao.
 - 4.7 Labour welfare schemes.
 - 4.8 Workers' participation in management.

UNIT II

Professional Ethics

- 5.1 Concept of professional ethics
 - 5.2 Need for code of professional ethics.
 - 5.3 Professional bodies and their role.
- 6. Sales and Marketing management**
- 6.1 Functions and duties of sales department
 - 6.2 Sales forecasting, sales promotion, advertisement and after sale Services.
 - 6.3 Concept of marketing.
 - 6.4 Problems of marketing.

6.5 Pricing policy, break even analysis.

UNIT III-

Labour Legislation Act (as amended on date)

- 7.1 Factory Act 1948.
- 7.2 Workmen's Compensation Act 1923.
- 7.3 Apprentices Act 1961.
- 7.4 PF Act, ESI Act.
- 7.5 Industrial Dispute Act 1947.
- 7.6 Employers State Insurance Act 1948.
- 7.7 Payment of Wages Act, 1936.
- 7.8 Intellectual Property Rights Act

8. Material Management

- 8.1 Inventory control models.
- 8.2 ABC Analysis, Safety stock, Economic ordering quantity.
- 8.3 Stores equipment, Stores records, purchasing procedures, Bin card, Cardex.
- 8.4 Material handling techniques.

UNIT IV

Financial Management

- 9.1 Importance of ledger and cash book.
- 9.2 Profit and loss Account, Balance sheet.
- 9.3 Interpretation of Statements, Project financing, Project appraisal, return on investments.

Entrepreneurship Development

- 10.1 Concept of entrepreneur and need of entrepreneurship in the context of prevailing employment conditions.
- 10.2 Distinction between an entrepreneur and a manager.
- 10.3 Project identification and selection.
- 10.4 Project formulation.
- 10.5 Project appraisal.
- 10.6 Facilities and incentives to an entrepreneur.

11. Fundamental of Economics

- 11.1 Micro economics.
- 11.2 Macro economics.

UNIT V-

Accidents and Safety

- 12.1 Classification of accidents based on nature of injuries, event and place.
- 12.2 Causes and effects of accidents.
- 12.3 Accident-prone workers.

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III Year V Semester

DCS-502: DATABASE MANAGEMENT SYSTEM

UNIT I

OVERVIEW OF DBMS :

Data, Representation of Data, Record, Data item, Field name, File, Data and Information, Database (Properties), Benefitsof Database approach, Database Management System (Capabilities, Advantages, Disadvantages) and Functions of DBMS. Basic DBMS terminology (Data items, Entities and Attributes, Schema and Subschema, Database users, Instance and Schemas). Three views of Data (External View, Conceptual View, Internal View), Three level architecture of DBMS, Data Independence.

DATA MODELS :

Define data model, classify data model, Local Models : Object and Record based- Object Oriented Model- Entry relationship Models - Entity sets and relationship sets-

Attributes - Keys in entity and relationship sets : (a) Super Key (b) Candidate Key (c) Primary Key (e) Unique Key - Mapping constraints.Object based logical models, E-R model E-R diagram, Notations, Hierarchical Model (Advantage, Disadvantages), Network model (Advantages, Disadvantages), Relational Model (Advantages, Disadvantages), Object oriented database, Object oriented relational database.

RELATIONAL MODEL :

Advantages, Disadvantages, Codd's 12 rules, Definition of Relations, Degree and Cardinality, Relational Model Constraints (Domain, Tuple Uniqueness, Key Constraints, Integrity Constraints, Entity constraints). Relations algebra (Basic operation : Union intersection and difference), Additional Relational Algebraic Operations (Projection, Selection rows, Division)

UNIT II-

RELATIONAL DATABASE DESIGN :

Functional dependencies (I, II & III), Normal forms, Normalization, Boyce Codd Normal Form, Multivalued dependencis and Forth Normal Form, Join Dependencies and Fifth normal forms.

UNIT III-

STRUCTURE QUERY LANGUAGE (SQL) :

SQL, Object naming conventions, Object naming guidelines, Data types (Varchar 2, Number, Long, Date, Raw, Long Raw,Rowid, Char etc.), Tables, Views, Indexes, SQL Commond :-

DESCRIBE, SELECT, COLUMN ALIASES, CONCATENATION OPERATOR, DISTINCT CLAUSE, ORDER BY, WHERE CLAUSE, LOGICAL OPERATIONS, SQL OPERATORS, Accessing Metadata.

6. RATIONAL DATABASE :

Data definition language- Data manipulation language- Relational algebra - Operators : Select, Project, Join, Rename, etc. - Simple example.

UNIT IV

SECURITY :Authorization and View- Security constraints - Integrity Constraints- Encryption.

UNIT V

PL :User defined function, Control of flow statement of PL/SQL, Procedures/Stored procedures, transaction, triggers, cursors, granting and revoking.

LIST OF BOOKS

1. An Introduction to Database System - C. J. Date
2. Database System Concepts - A. Silberschatz& H. F. Korth
3. Database Concepts and Systems - LvanBayroos/SPD
4. Fundamental of Database System - R. Elmashri& S. B. Navathe

DATABASE MANAGEMENT SYSTEM LAB

STRUCTURED QUERY LANGUAGE

1. Creating Database

- Creating a database
- Creating a table
- Specifying relational data types
- Specifying constraints
- Creating indexes

2. Table and Record Handling

- INSERT statement
- Using SELECT and INSERT together
- DELETE, UPDATE, TRUNCATE Statement.
- DROP, ALTER statement

3. Retrieving Data From a Database

- The SELECT statement
- Using the WHERE clause
- Using Logical Operators in the WHERE clause
- Using In, BETWEEN, LIKE, ORDER BY, GROUP BY & HAVING clause
- Using Aggregate Functions
- Combining Tables Using JOINS

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III Year V Semester
DCS-503:JAVA PROGRAMMING

UNIT I

An Overview of JAVA:-

Introduction to Object Oriented Programming (two paradigms, abstraction, the three oops principles) creation of JAVA, JAVA Applits& applications, security & portability.

3. Data Types &Control statements:

Integer, floating point type, character, Boolean, all Operators, JAVA's selection statements,iteration and jump statement.

4. Classes & Methods:

Class fundamentals, declaring objects, overloading methods & constructs, access control, nested and inner classes, exploring the string class.

5. Inheritance:

Inheritance basics, member access and inheritance. Overriding : Method overriding, super keyword, polymorphism and virtual function.

UNIT II

Packages and Interface :

Defining, Creating and accessing a package, Understanding CLASSPATH, Importing packages, difference between classes and interface, defining an interface, implementing interface, applying interface, variable in interface and extending interface, Exploring Java io.

7. Exception Handling :

Concept of exception handling, benefits of exception handling, termination or presumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating won exception sub classes, string handling, exploring java.util.

UNIT III

Multithreading : Difference between multi threading and multi tasking, thread life cycle, creating threads, thread priorities, synchronizing threds inter thread communication, thread groups, daemon threads, enumerations, auto boxing annotations, generics.

9. Event Handling :

Events, Events sources, Event classes, Event Listeners, Delegation event model, handling mouse and key board events, Adapter classes. The AWT class hieracrchy, user interface components - labels, button, vanvas,

scrollbars, textcomponents, check box, check box groups, choice, list panels - scrollpane, dialogs, menubar, graphics, layout manager - layout manager types border, grid, flow card and grid bag.

UNIT IV

Applets :

Concept of Applets, difference between applets and application, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

UNIT V-

Swing - Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- Applet, Frame and Component, Icons and Labels, text fields, button - the JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees and Tables.

LIST OF PRACTICALS

1. WAP to find the average and sum of the N numbers using command line argument.
2. WAP to demonstrate type casting.
3. WAP to find the number of arguments provide at run time.
4. WAP to test the prime number.
5. WAP to calculate the simple interest and input by users.
6. WAP to create a simple class to find out the area and perimeter of rectangle and box using super and this keyword.
7. WAP to find G.C.D. of the number.
8. WAP to design a class account using the inheritance and static that show all function of bank (with drawl ,deposited).
9. WAP to find the factorial of a given number using Recursion.
10. WAP to desing a class using abstract methods and classes.
11. WAP to design a string class that perform string method (equal, reverse the string, change case).
12. WAP to handle the exception using try and multiple catch block.
13. WAP that implement the Nested try statements.
14. WAP to create apackage that access the member of external class as wel as same package.
15. WAP that import the user defina package and access the member variable of classes that contained by package.

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III Year V Semester

DCS-504: E-COMMERCE

UNIT I

ELECTRONIC COMMERCE :Overview, Definitions, Advantages and Disadvantages of E- commerce, threats of E-commerce, Managerial Prospective, Rules and Regulations For controlling E-commerce, Cyber Laws

UNIT II

TECHNOLOGY :Relationship Between E-Commerce and Networking, Different Types of Networking For E-commerce, Internet, Internet and Extranet, EDI System Wireless Application Protocol : Definition, Hand Held Devices, Mobility and Commerce, Mobile computing, Wireless Web, Web Security, Infrastructure Requirement Form E-Commerce.

UNIT III-

BUSINESS MODELS OF E-COMMERCE :Model based on transaction, Type, Model Based on Transaction Party -B2B, B2C,C2b, C2c, E-Governance.

1. **E-STRATEGY :**

Overview, Strategic, Methods for developing E-commerce.

UNIT IV :

SUPPLY CHAIN MANAGEMENT :

E-logistics, Supply Chain Portal, Supply Chain Planning Tools (SCP Tools), Supply Chain Execution (SCE), SCE- Framework, Internet's effect on Supply Chain Power.

1. **E-PAYMENT MECHANISM :**

Payment through card system, E-Cheque, E-Cash, E-Payment Threats and protections.

2. **E-MARKETING :**

Home-Shopping, E-Marketing, Tele-Marketing.

3. **ELECTRONIC DATA INTERCHANGE (EDI):**

Meaning, Benefits, Concepts, Application, Edi Model.

UNIT V

RISK OF E-COMMERCE : Overview, Security for E-commerce, Security Standards, Firewall, Cryptography, Key Management, Password system, Digital certificates, Digital signatures.

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III Year VI Semester

DCS-601: Environmental Education & Disaster Mgmt.

UNIT I-

INTRODUCTION:

- Basics of ecology, Ecosystem, Biodiversity Human activities and its effect on Ecology and eco system, different development i.e. irrigation, urbanization, road Development and other engineering activities and their effects on Ecology and eco system, Mining and deforestation and their effects.
- Lowering of water level, Urbanization.
- Biodegradation and Biodegradability, composting, bio remediation, Microbes Use of biopesticides and biofungicides.
- Global warning concerns, Ozone layer depletion, Green house Effect, Acid Rain, etc.

2. POLLUTION:

Sources of pollution, natural and manmade, their effects on living environments And related legislation.

2.1 WATERPOLLUTION:

- Factors contributing water pollution and their effect.
- Domestic waste water and industrial waste water. Heavy metals, microbes and Leaching metal.
- Physical, Chemical and Biological Characteristics of waste water.
- Indian Standards for quality of drinking water.
- Indian Standards for quality of treated waste water.
- Treatment methods of effluent (domestic waste water and industrial/ Mining Wastewater), its reuse/safe disposal.

2.2 AIRPOLLUTION:

Definition of Air pollution, types of air pollutants i.e. SPM, NOX, SOX, CO, CO₂, NH₃, F, CL, causes and its effects on the environment.

- Monitoring and control of air pollutants, Control measures techniques. Introductory Idea of control equipment in industries i.e.
 - A. Settling chambers
 - B. Cyclones
 - C. Scrubbers (Dry and Wet)
 - D. Multi Clones
 - E. Electro Static Precipitations
 - F. Bog Fillers.
- Ambient air quality measurement and their standards.
- Process and domestic emission control
- Vehicular Pollution and Its control with special emphasis of Euro-I, Euro-II, Euro-III and Euro IV.

2.3 NOISE POLLUTION:

Sources of noise pollution, its effect and control.

2.4 RADISACTIVE POLLUTION:

Sources and its effect on human, animal, plant and material, means to control and Preventive measures.

2.5 SOLID WASTE MANAGEMENT:

Municipal solid waste, biomedical waste, Industrial and Hazardous waste, Plastic Waste and its management.

UNIT II- LEGISLATION:

Preliminary knowledge of the following Acts and rules made there under-

- The Water (Prevention and Control of Pollution) Act - 1974.
- The Air (Prevention and Control of Pollution) Act - 1981.
- The Environmental Protection (Prevention and Control of Pollution) Act -1986.

Rules notified under EPA Act - 1986 Viz.

The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000

The Hazardous Wastes (Management and Handling) Amendment Rules, 2003

Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003

The Noise Pollution (Regulation and Control) (Amendment) Rules, 2002.

Municipal Solid Wastes (Management and Handling) Rules, 2000.

The Recycled Plastics Manufacture and Usage (Amendment) rules, 2003.

UNIT III-

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) :

- Basic concepts, objective and methodology of EIA.
- Objectives and requirement of Environmental Management System (ISO-14000) (An Introduction).

UNIT IV-

DISASTER MANAGEMENT:

Definition of disaster - Natural and Manmade, Type of disaster management, How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and Benefit of vulnerability reduction, Factor promoting vulnerability reduction and Mitigation, Emergency support function plan. Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication.

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III Year VI Semester

DCS-602: NETWORK ADMINISTRATION & SECURITY

1. Introduction to Windows server, Professional and Windows 2003 server, Installation & configuration of Windows server professional, Installation & configuration of Windows server.
2. User & Group Managements, NTFS & share permissions. Using device manager, Drivers signing & signature verification. Managing Ports, Installing & Managing & configuring printers. Disk Management Tools & Tasks, File Systems, User Management. Installing Active Directory.
3. Domain user account, configuring user account properties. Domain groups. Viewing a user's effective permission. Creating and managing shares. Implementing files and folder NTFS & share permission, Special permission, inheritance. Implementing Shadow copies. Implementing and Managing the Distributed File system(DFS). Auditing Access to Resources.
4. Installing and Configuring Terminal Services. Managing servers remotely using terminal services (Remote desktop). Backup restoring data.
5. Installing DNS. Implementing DNS in windows networks.
6. Installing and configuring DHCP. Monitoring and Managing Internet information services (IIS 6.0) Remote Access server. Configuring & Implementing VPN. Configuring & Implementing Remote Access services.
7. Configuring & Implementing routing services. Configuring & implementing ICS. Active directory services. Implementing active directory services forest.
8. Planning implementing an OU structure. Implementing server roles. Restoring active directory.
9. Local and domain security policies. Working with group policy

NETWORK SECURITY

1. Introduction
Need for securing a network; Principles of Security, Type of attacks, introduction to cyber crime, cyber law-Indian Perspective (IT Act 2000 and amended 2008), cyber ethics, ethical hacking. What is hacking? attacker, phreaker .
2. Securing Data over Internet
Introduction to basic encryption and decryption, concept of symmetric and asymmetric key cryptography, overview of DES, RSA and PGP. Introduction to Hashing: MD5, SSL, SSH, HTTPS, Digital Signatures, Digital certification, IPSec
3. Virus, Worms and Trojans
Definitions, preventive measures – access control, checksum verification, process configuration, virus scanners, heuristic scanners, application level virus scanners, deploying virus protection.
4. Firewalls
Definition and types of firewalls, firewall configuration, Limitations of firewall.
5. Intrusion Detection System (IDS)
Introduction; IDS limitations – teardrop attacks, counter measures; Host based IDS set up
6. Handling Cyber Assets- Configuration policy as per standards, Disposable policy

7. Virtual Private Network (VPN)

Basics, setting of VPN, VPN diagram, configuration of required objects, exchanging keys, modifying security policy

8. Disaster and Recovery

Disaster categories; network disasters – cabling, topology, single point of failure, save configuration files; server disasters – UPS, RAID, Clustering, Backups, server recovery

List Of Practical's

1. Installation & configuration of Windows professional.
2. Installation & configuration of Windows server.
3. Installing and Configuring Terminal Services
4. Installing DNS. Implementing DNS in windows networks.
5. Installing and configuring DHCP.
6. Configuring & Implementing routing services
7. Configuration and setup of adhoc network and infrastructure network.
8. NET tools, Deployment of NETTOOLS.
9. Tracing of email origin using email trace pro utility.
10. Use of keyloggers and anti key logger to secure your system.

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III Year VI Semester
DCS-603: PROJECT

Rationale:

The purpose of including project in curriculum is to develop skill and knowledge specifications of software used in computers.

1. INFORMATION TECHNOLOGY PROJECT:

The student is expected to work on a project in consultation and acceptance with the instructor on either system software aspects related to industrial environment. The end targets for the project should be well defined and evaluation should place major importance on meeting these targets.

2. DATA PROCESSING PROJECT:

The student is expected to work and learn from implementing an application software and study its functional and performance aspects and submit a report. The evaluation must be based on the project report and the seminars.

3. SOFTWARE MAINTENANCE PROJECT:

Similar as Information Technology Project (Software), related to maintenance operation and evaluation of the systems.

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