SYLLABUS

DIPLOMA IN COMPUTER ENGINEERING
(DAY COURSE)

w.e.f.: July, 2019

UNIVERSITY POLYTECHNIC

FACULTY OF ENGINEERING & TECHNOLOGY

JAMIA MILLIA ISLAMIA

NEW DELHI-110025

First Semester

S. No	Code No	Subject	Credit Hrs	Sessional	Univ. Exam	Total	Periods/ Week
Theory Courses							
1	DCOS 101	Communication Skill - I	4	40	60	100	4
2	DCOM 102	Applied Maths-I	4	40	60	100	4
3	DEE 103	Electrical and Electronics Engg.	4	40	60	100	4
4	DME 104	Elements of Mechanical Engg.	4	40	60	100	4
5	DCO 105	Fundamental of Computers	4	40	60	100	4
Practical Courses							
1	DEE 113	Electrical and Electronics Engg.	2	30	20	50	2
2	DME 116	Workshop Practice	2	30	20	50	3
3	DME 117	Engineering Drawing	2	30	20	50	3
4	DCO 115	P.C.Software Lab.	2	30	20	50	2
		Total	28	320	380	700	30

Second Semester

S. No	Code No	Subject	Credit Hrs	Sessional	Univ. Exam	Total	Periods/ Week
Theory Courses							
1	DCOM 201	Applied Maths-II	4	40	60	100	4
2	DCOP 202	Applied Physics	4	40	60	100	4
3	DEL 203	Electronics Devices and Application	4	40	60	100	4
4	DCOC 204	Engineering Chemistry & Environmental Science	4	40	60	100	4
5	DCO 205	Programming in C	4	40	60	100	4
Practical Courses							
1	DCOP 212	Applied Physics	2	30	20	50	2
2	DEL 213	Electronics Devices and Application	2	30	20	50	2
3	DCOC 214	Engineering Chemistry	2	30	20	50	2
4	DCO 215	Programming in C	2	30	20	50	2
		Total	28	320	380	700	28

Third Semester

S. No	Code No	Subject	Credit Hrs	Sessional	Univ. Exam	Total	Periods/ Week
Theory Courses							
1	DCO 301	Computer Oriented Numerical Methods	4	40	60	100	4
2	DCO 302	Object Oriented Programming	4	40	60	100	4
3	DEE 303	Signals & Systems	4	40	60	100	4
4	DCO 304	Computer Architecture	4	40	60	100	4
5	DEL 306	Digital Electronics	4	40	60	100	4
Practical Courses							
1	DCO 312	Object Oriented Programming	2	30	20	50	2
2	DCO 314	Computer Workshop	2	30	20	50	2
3	DCO 315	Computer System & Maintenance	2	30	20	50	2
4	DEL 316	Digital Electronics Lab	2	30	20	50	2
		Total	**28**	**320**	**380**	**700**	**28**

Fourth Semester

S. No	Code No	Subject	Credit Hrs	Sessional	Univ. Exam	Total	Periods/ Week
Theory Courses							
1	DCOS 401	Communication Skills - II	4	40	60	100	4
2	DCO 402	Database Management System	4	40	60	100	4
3	DCO 403	Operating System	4	40	60	100	4
4	DCO 404	Data Structures	4	40	60	100	4
5	DEL 405	Microprocessor & Microcontroller	4	40	60	100	4
Practical Courses							
1	DCO 412	Database Management System	2	30	20	50	2
2	DCO 413	Operating System	2	30	20	50	2
3	DCO 414	Data Structures.	2	30	20	50	2
4	DEL 415	µP Programming	2	30	20	50	2
		Total	**28**	**320**	**380**	**700**	**28**

Fifth Semester

S. No	Code No	Subject	Credit Hrs	Sessional	Univ. Exam	Total	Periods/ Week
Theory Courses							
1	DCO 501	Computer Graphics	4	40	60	100	4
2	DCO 502	Web Technology	4	40	60	100	4
3	DCO 503	Data Communication & Computer Networks	4	40	60	100	4
4	DCO 504	Software Engg.	4	40	60	100	4
5	DCO 505	Java Programming	4	40	60	100	4
Practical Courses							
1	DCO 511	Computer Graphics & Multimedia	2	30	20	50	2
2	DCO 512	Web Technology	2	30	20	50	2
3	DCO 513	Computer Networks	2	30	20	50	2
4	DCO 515	Java Programming	2	30	20	50	3
5	DCO 520	Minor Project	1	25	-	25	-
		Total	**29**	**345**	**385**	**725**	**29**

Sixth Semester

S. No	Code No	Subject	Credit Hrs	Sessional	Univ. Exam	Total	Periods /Week
Theory Courses							
1	DCO 601	Advanced RDBMS	4	40	60	100	4
2	DCO 602	Visual Programming	4	40	60	100	4
3	DCO 603	Information Security & Cyber Law	4	40	60	100	4
4	DCO 604/605/606	*Elective	4	40	60	100	4
5	DCO 608	ICT Management & Entrepreneurship Development	4	40	60	100	4
Practical Courses							
1	DCO 611	RDBMS	2	30	20	50	2
2	DCO 612	Visual Programming	2	30	20	50	2
3	DCO 620	Project	8	120	80	200	6
4	DCO 630	Industrial Training & Visits	1	25	-	25	-
		Total	**33**	**395**	**430**	**825**	**32**

*Elective: - 1. 604: Embedded System, 2. 605: Artificial Intelligence, 3. 606: Mobile Computing.

NOTE: Project Topics (DCO 620) shall be assigned to the students at the commencement of 5th Semester.

COMMUNICATION SKILLS -I
DCOS-101

UNIT	TOPIC	MARKS
I.	Reading *a. Comprehension (Beginner)*	10
II.	Grammar *a. Tenses, Active, Passive* *b. Vocabulary*	20
III.	Structure *a. Sentence Formation* *b. Word Formation*	10
IV.	Writing - I *a. Report Writing* *b. Curriculum Vitae*	10
V	Writing - II *a. Application* *b. Business Letter*	10

APPLIED MATHEMATICS -I
DCOM-102

UNIT I   ALGEBRA

Arithmetic progression, its nth term, sum to n terms. Geometric progression, its nth term, sum to n terms and sum of infinite terms. Binomial theorem (without proof) for any index, General and middle term, terms independent of x, First and second binomial approximation.

UNIT II   DETERMINANTS

Determinants (upto 3rd order only), minors, co-factors, Properties of determinants, solution of linear simultaneous equations in three variables by Cramer's rule.

UNIT III   MATRICES

Definition and examples of matrices, types of matrices, basic operations, equality of matrices, addition, multiplication and scalar multiplication of matrices, transpose of a matrix, symmetric, skew-symmetric matrices, singular and non-singular matrices, cofactor matrix, adjoint of a matrix, inverse of a matrix, solutions of simultaneous equations in three variables by matrix inverse methods.

UNIT IV   CO-ORDINATE GEOMETRY OF TWO DIMENSIONS

Definition of locus with problems, Equations of straight lines in various forms. Angle between two lines, Perpendicular distance formula, Conic sections, Circle, Parabola, Ellipse and Hyperbola.

UNIT V   VECTORS

Scalar and vectors, addition and subtraction of vectors and their simple applications, multiplication of vector by scalar, Scalar and vector product of two vectors. Scalar product of three vectors, Geometrical interpretation.

Text Book/Reference Book

1. A text book of Applied Mathematics, Vol I and II by Dr Neeraj Pant
2. Applied Mathematics, Vol I and II by Dr Hari Arora, A Sachdev

ELECTRICAL & ELECTRONICS ENGINEERING
DEE-103

UNIT-I   DC CIRCUIT:

Laws of resistance, Effect of temperature on resistance, Ohm's law, series & parallel combination of resistances grouping of cells, series, parallel, and mixed combinations, Series and parallel combination of Inductors.

UNIT-II   ELECTROSTATICS & CAPACITANCE:

Concept of capacitance & its ratings, parallel plate, spherical, & cylindrical capacitor & their capacities, energy stored in capacitor, concept of dielectric, dielectric constant, dielectric breakdown, series & parallel combination of capacitor, numerical problems

UNIT-III   ELECTROMAGNETISM:

Analogy between electric & magnetic circuit, force on a moving charge & current in a magnetic field, force between two current carrying parallel conductor, magnetic field around current carrying straight conductor, Faradays laws, Lenz's law, Fleming's rule, principle of self & mutual induction, numerical problems.

UNIT-IV   AC CIRCUITS:

Concept of alternating current and voltage equation of instantaneous values, a c through pure resistance, pure inductance & pure capacitance, concept of conductance, susceptance & admittance, R L, R C, R L C, series parallel circuits, different methods of solving a c series & parallel circuits, numerical problems

UNIT-V   ELECTRONICS & ELECTRONICS COMPONENTS:

Active & Passive Component current and voltage source, conversion of voltage source to current source or vice-versa, semiconductors, n-p-n & p-n-p transistor, configuration (CB, CE, &CC) numerical problems.

ELEMENTS OF MECHENICAL ENGINEERING
DME -104

UNIT – I TRANSMISSION OF POWER:

Different modes of power transmission Belt drive: Material of belt, flat belt V belt open and cross belt device, length of belt (without derivation), Velocity ratio, slip, angle of contact, derivation of tension ratio for flat belt., Power transmitted through belts. Advantage of V-belt over flat belt. Simple numerical problems. $T1/T2 = e^{\mu\varnothing}$ Chain Drive: Classification Clutch: Principle of clutch, comparison between chain and belt drive. Pulleys: Introduction, types of pulleys. Gears: Spur, helical, bevel, spiral, worm gear, rack and pinion, Gear trains: simple & Compound gears train and simple numerical problems.

UNIT-II

Steam generators: Introduction, classification, Differentiation between fire tube and water Tube boilers. Simple vertical boiler, Babcock & Wilcox boiler, Cochran boiler, Boiler accessories and mountings, Turbines: Introduction & classification of steam turbine, concept of reaction and Simple impulse turbine, comparison between impulse & reaction turbines, losses in steam turbine. Hydraulics turbine**:** Classification, construction, working of Pelton wheel, Francis turbine and application of reaction and impulse turbine.

UNIT–III Internal Combustion Engines:

1. Classification & application of I.C. engine commonly used spark ignition engine and compression engines. **2.** Working principles of two stroke petrol and diesel engine **3.** Ignition system in petrol engine. **4.** Simple carbonator **5.** Cooling and lubrication system of IC engines. Lubricants: Introduction, method of lubrication: Petrol System, mixed, Splash, force system.

UNIT-IV

Pumps Construction and Working of reciprocating, centrifugal and gear pump, Air compressor: Working of various type of air compressor and their application Material Handling: Tower and bridge crane, jaw Crushers, Hydraulic jack and hydraulic Lift.

UNIT-V

Refrigeration and Air Conditioning System: Introduction, unit of refrigeration, coefficient of performance, vapour compression cycle, simple vapour absorption cycle. Applications. Air conditioning System: Purpose of air conditioning, Factor affecting air conditioning, some definition relating to psychometric parameters like dry bulb temp., wet bulb temp., humidity etc. Window air conditioner and desert cooler.

FUNDAMENTAL OF COMPUTERS
DCO-105

UNIT–I

Digital Computer systems, Characteristics, Digital vs. Analog computer Systems, History, Computer Generations, Types of computers & their classifications, Application of Computer in various fields, Computer Hardware & Software, Elements of computer hardware-CPU, I/O devices, storage and media used in PCs, Computer Software-Types of Software, System Software, Application Software.

UNIT-II

Types of PC e.g., Desktops, Workstations, Laptops, Notebooks, Palmtops, Memory System of a PC, Primary Memory, RAM (Random Access Memory, ROM (Read Only Memory), Secondary Memory, Types of Secondary Storage, Access Mechanism of storage Devices, PC setup and ROM-BIOS, Advanced Input/output Devices and their use MICR, OCR, Scanners, Light pen, Plotters.

UNIT–III

Number System - decimal, binary, octal and hexadecimal, Conversion from Decimal to Binary, Conversion from Binary to Decimal, Octal and Hexadecimal number system, representation of integers, floating point number, signed number representation, Binary Arithmetic-addition, subtraction, multiplication and division.

UNIT–IV

Basic concept & functions of an operating system, textual Vs GUI Interface, type of Operating Systems, concept of multiprogramming, multitasking, multiprocessing, Introduction to disk operating system (DOS), Commands and utilities, working with MS Windows, Unix and Linux, Working knowledge of PC Software Word Processor.

ELECTRICAL AND ELECTRONICS ENGG. LAB
DEE-113

LIST OF EXPERIMENTS

1. To verify the Ohm's law. Draw its V-I Characteristics.

2. To verify the relation $R_T = R_1 + R_2 + R_3 + \text{-------} + R_n$

3. To verify the relation $1/R_T = 1/R_1 + 1/R_2 + 1/R_3 + \text{-------} + 1/R_n$

4. To verify the Kirchhoff's current law (KCL).

5. To verify the Kirchhoff's voltage law (KVL).

6. To find for a filament lamp.

    (I)   Variation of power with voltage

    (II)   Variation of resistance with voltage.

7. To find the ratio of inductance values of coil having air core, iron core and partly air and iron core.

8. To find voltage current relationship in a single-phase R-L series circuit. Draw its impedance triangle and determine the power factor of the circuit.

9. To find voltage current relationship in a single-phase R-C series circuit. Draw its impedance triangle and determine the power factor of the circuit.

10. To find voltage current relationship in a single-phase R-L-C series circuit. Draw its impedance triangle and determine all the parameters.

WORKSHOP PRACTICE –I
DME-116

CARPENTRY SHOP:

Introduction of tools. Making of various joints**- Cross** lap joint, Half lap joint, Mortise and tenon joint, Dovetail joint.

FITTING SHOP:

Introduction of tools, Cutting and filing practice as per drawing, Drilling

SMITHY SHOP:

Introduction of tools, Hot working and cold working, Making of U clamp, Fan hook, Making of sheet metal joints.

WELDING SHOP:

A/C welding and gas welding, Preparation of lap joint and but joints, Preparation of Oxy acetylene gas welding joints.

UNIT-I   INTRODUCTION:

a. Drawing Instruments: Drawing instruments, Sizes and layout of standard drawing sheets, Sizes of drawing boards.

b. Lines, Lettering and Dimensioning:

Different types of lines and freehand Sketching**,** Different types of lines in engineering drawing as per BIS Specifications**,** Practice in free hand sketching of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles, small and large circles, parabolas', curves and ellipses.

UNIT-II   LETTERING TECHNIQUES AND PRACTICE: Instrumental single stroke vertical and inclined) lettering of 3to 7.mm. height. Instrumental double stroke lettering of 35 mm height in the ratio of 7:4 vertical

UNIT-III   DIMENSIONING: Necessity of dimensioning, terms and notations-methods and principles, dimensioning small components as in 4.2. below (mainly theoretical instructions), Dimensioning of overall sizes, circles thread holes, chamfered surfaces, angles tapered surface holes equally spaced on PCD counter sunk hole counter bored holes, cylindrical parts narrow. Space and gaps radii curves and arches chain and parallel dimensioning.

UNIT-IV   SCALE: Scales and their need and importance, Definition of representative fraction (RF) find RF of a given scale, Types of scales, Construction of plain and diagonal scales.

UNIT-V: Constructions of curves such as ellipse, parabola, hyperbola, cycloid epicycloid hypocycloid and involute.

P.C. SOFTWARE LAB
DCO-115

LIST OF PRACTICALS

1. MSWORD – Creating a Document, Editing and Saving.

2. MSWORD: Use of options from the Tool Bars – Format, Insert and Tools (Spell Check), Alignment of paragraphs and Text.

3. MSWORD: Creating a Table, Merging of Cells, Columns and Row Width.

4. MSEXCEL: Creating a Spreadsheet, Alignment of Rows, Columns and Cells using Format Tool Bar.

5. MSEXCEL: Entering formula expression through the formula tool bar and use of inbuilt functions – SUM, AVERAGE and STDEV.

6. MSEXCEL: Design a sheet for TEMPERATURE CONVERTER from Celsius to Fahrenheit and Fahrenheit to Celsius.

7. MSEXCEL: Data Analysis using inbuilt Tool Packs – tests of significance.

8. MSEXCEL: Creating and Saving Graphs.

9. MSPOWERPOINT: Make a Power Point Presentation of College Education System.

10. MSPOWERPOINT: Make a power point presentation on "Wild Life". Apply various color schemes, audio effects and animation schemes.

11. MSACCESS: Creating Database, structuring with different types of fields.

12. MSACCESS: use of Query facility for accessing the information.

13. Practice of some fundamental DOS commands – TIME, DATE, DIR, MD, CD, RD, DEL, TREE, COPY, VOL and LABEL.

14. Practicing WINDOWS Operating System – Use of Mouse, Title Bar, Minimum, Maximum and Close Buttons, Scroll Bars, Menus and Tool Bars.

15. WINDOWS Explorer – Creating Folders, COPY and PASTE functions.

APPLIED MATHEMATICS -II
DCOM-201

UNIT-I DIFFERENTIAL CALCULUS

Limit and continuity (without problems), Differentiation of functions by First Principle, Differential of sum, product and quotient functions, Differential of a function of a function (Chain rule), Logarithmic differential, Higher order derivatives.

UNIT-II INTEGRAL CALCULUS

Indefinite integral, Integration of a function, standard formulae, the fundamental laws of integration, Integration by substitution method, by parts method and partial fractions method.

UNIT-III APPLICATIONS OF CALCULUS

Maxima and minima, Tangent and normal, Evaluation of definite integral. Properties of definite integral, Area bounded by a curve between two ordinates and x-axis.

UNIT-IV DIFFERENTIAL EQUATIONS

Differential equation, Order and degree of differential equations, Solution of differential equations of first order and first degree, variable separable, Homogeneous and linear differential equations, Solution of linear differential equations of 2nd order with constant coefficient.

UNIT-V COMPLEX NUMBERS

Complex Number, representation of a complex number (Argand Diagram), Complex number in rectangular, polar and exponential forms, Conversion from one form to another form. De Moivre's Theorem, Roots of complex number.

Text Book/Reference Book

1. A text book of Applied Mathematics, Vol I and II by Dr Neeraj Pant
2. Applied Mathematics, Vol I and II by Dr Hari Arora, A Sachdev

APPLIED PHYSICS
DCOP-202

UNIT-I

Unit and Dimensions Fundamental and derived units (SI System), Dimension of various physical quantities, uses of dimensional analysis and its limitations. Accuracy and precision of measuring instruments, error in measurement.

UNIT-II

Coulomb's law, Electric field, electric field at a point due to Point charge, Electric flux, Gauss's theorem, electric field at a point due to a due to a uniformly charged thin sheet, Capacity of parallel plate capacitor, energy store in a capacitor, combination of capacitor (Series and Parallel), Kirchhoff's law, application of Kirchhoff's law to the wheat stone bridge, Meter bridge and potentiometer. Heating effect of current, Electric Power

UNIT-III

Biot-savart law, Magnetic field due to straight wire, circular loop, Force experienced by moving charge and a current carrying conductor in a uniform magnetic field, Torque on current loop, force between two parallel current carrying conductors, Definition of an Ampere, Moving coil galvanometer, conversion of galvanometer into ammeter and voltmeter.

UNIT-IV

Magnetic properties of materials and magnetic circuit, Para, dia, ferromagnetic substances, magnetic circuit, magneto motive force (MMF), reluctance, permeance, ohms law of magnetic circuit, reluctance in series, reluctance in parallel, relation between MMF and magnetizing force (H), magnetic circuit due to a solenoid and hysteresis loop, generation and propagation of electromagnetic waves, complete electromagnetic spectrum, electromagnetic radiation and earth's atmosphere.

UNIT-V

J. J. Thomson model, Rutherford model, Bohr's model and its shortcoming, X-ray production, properties and uses, Mass defect, binding, nuclear stability, fusion, fission, Half-life, energy generated in reactors and radiation hazard.

TEXT BOOK   -   Halliday & Resnick

REFERENCE BOOKS
1.   Basic Applied Physics by H. R Meena, Neeraj Pant, Arjun Singh & Har Lal
2.   Applied Physics by R. K Gaur.

ELECTRONICS DEVICES & APPLICATION
DEL-203

UNIT-I
Introduction: Introduction to electronics engineering: Physical and applied electronics, Applications of electronics engineering in different fields, Electronic components: active and passive, Ideal and practical voltage and current sources.

UNIT-II
PN Junction Diode & Rectifiers: PN junction, Behavior of PN junction under forward and reverse bias condition, Semiconductor diode characteristics, Static and dynamic resistances, Their calculation from diode characteristics, Diode as half and full wave rectifier: Center-tap and Bridge type, Ripple factor and its value for half and full wave rectified output, Calculation of DC voltage, RMS voltage and rectification efficiency.

UNIT-III
Filters & Special Purpose Diodes: Filters, Capacitor input filter, Choke input filter, L-type and ∏-type filter, Zener diode, Breakdown mechanisms: Zener and avalanche breakdown mechanism, Zener parameters, Application of Zener diode in voltage regulator, Varactor diode, LED.

UNIT-IV
Bipolar Junction Transistor: Introduction of Bipolar Junction Transistor, PNP and NPN transistors their symbol and mechanism of current flow, Explanation of fundamental current relations, Concept of leakage current in CB, CE and CC configuration, Input and output characteristics, Determination of input and output resistances: static and dynamic, Comparison of CB, CE and CC configurations.

UNIT-V
Amplifier & Biasing Circuits: Transistor as an amplifier in CE configuration, DC equivalent circuit, DC load line and operating point, Effect of temperature and replacement of transistor on operating point, Need for stabilization of operating point, effect of fixing operating point in cut-off and saturation region on the performance of amplifier, Transistor biasing circuits: Fixed biasing, Collector to base biasing, Self-biasing and Emitter biasing circuits.

Text Books:

1. Basic Electronics and Linear Circuit: D C Kulshrestha, N N Bhargava & S C Gupta
2. Applied Electronics: by R S Sedha

Reference Books:

1. Electronic Devices and Circuit Theory: by Robert Boylested& Louis Nashelsky
2. Principles of Electronics: V K Mehta

ENGINEERING CHEMISTRY & ENVIRONMENTAL SCIENCE
DCOC-204

UNIT I: VOLUMETRIC AND GRAVIMETRIC ANALYSIS

1. Molecular mass, mole, weak and strong electrolytes Equivalent mass and Gram-equivalent.

2. Strength, Normality and Molarity of a solution, Normality equation.

3. Problems based on Volumetric and Gravimetric analysis.

UNIT II: WATER CHEMISTRY

1. Impurities in water, Hardness, Units of Hardness and Calcium carbonate equivalent.

2. Estimation of Dissolved Oxygen, Alkalinity and Hardness by EDTA method.

UNIT III: CORROSION AND LUBRICANTS

1. Dry and Wet corrosion, Galvanic corrosion, Concentration corrosion, Pitting corrosion and Stress corrosion.

2. Protection of corrosion by Proper designing, Alloying, Cathode protection and Coating methods.

3. Types and Mechanism of Lubricants, Characteristics of lubricants like Viscosity, Acid value, Saponification value, Cloud point, Pour point, Flash point and Fire point.

UNIT IV: METAL AND ALLOYS

1. Cast iron, Steel and Heat treatment.

2. Necessity of making alloys, Composition, properties and uses of Brass, Bronze, Gun metal, Invar and Duralumin.

UNIT V: POLYMERS AND MANAGEMENT OF WASTE MATERIALS

1. Polymers: Classification, Types of polymerization reactions, Biodegradable Polymers, Examples.

2. e-waste materials, disposal, recycling and their harmful effects.

TEXT BOOK

1. Engineering chemistry by S.S. Dara
2. Engineering chemistry by Shikha Agrawal

PROGRAMMING IN C
DCO-205

UNIT-I

Computer Languages, Generation of Languages, Translators- Assemblers, Interpreters, Compilers, Algorithm, Pseudo-code, Flowcharts- rules & symbols, Structured Programming concepts, various techniques of programming, Use of programming.

UNIT– II

Introduction to 'C', importance of C, basic structure of a C program, constants, variables and data types, Operators and expressions, managing I/O operators, Control Statement: 'IF' statement and its various forms, goto statement, for, while and do- while loops, Switch Decision making statement.

UNIT–III

Arrays: Array notation, storage and representation, manipulating array elements, using multidimensional arrays, arrays of unknown or varying size, String, **Functions:** User defined functions and their use.

UNIT IV

Pointers: Introduction to Pointers, address operator and pointers, declaring and initializing pointers, assignment through pointers, pointers and arrays, **Structures:** Purpose and usage of structures, declaring structures, assigning of structures, File Handling – sequential and random file, Memory allocation, Command Line Parameters.

Textbooks/Reference Books:

- Let US C by Yashavant Kanetkar; BPB Publication.
- C: The Complete Reference by Herbert Schildt; Mc Graw Hill Education.
- Programming in C by Reema Thareja; Oxford Publication.

LIST OF EXPERIMENTS

1. To find the volume of metal used in a hollow cylinder closed at one end using vernier calipers.

2. To Measure Density of a Wire using Screw gauge.

3. To Measure Radius of Curvature of a Lens, Mirror using Spherometer.

4. To find the acceleration due to gravity using simple pendulum and to draw ℓ-T^2 graph and hence to read the length of the second's pendulum.

5. To find resistance of a given wire using meter bridge.

6. To compare the EMF of two given primary cells using potentiometer.

7. To Determine Refractive Index of Glass using Prism.

8. To determine the focal length of a convex lens by two-pin method.

ELECTRONICS DEVICES & APPLICATIONS LAB.
DEL-213

LIST OF EXPERIMENTS

1. To draw V-I characteristics of p-n junction diode and calculate static and dynamic resistances in forward and reverse bias conditions.

2. To draw V-I characteristics of Zener diode and calculate static and dynamic resistances in forward and reverse bias conditions.

3. To draw V-I characteristics of light emitting diode and calculate static and dynamic resistances in forward and reverse bias conditions.

4. To calculate ripple factor of half wave rectifier without and with filers.

5. To calculate ripple factor of Centre-tap full wave rectifier without and with filers.

6. To calculate ripple factor of bridge-type full wave rectifier without and with filers.

7. To draw input characteristics for common base transistor and calculate input static and dynamic resistances.

8. To draw output characteristics for common base transistor and calculate output static and dynamic resistances.

9. To draw input characteristics for common emitter transistor and calculate input static and dynamic resistances.

10. To draw output characteristics for common emitter transistor and calculate output static and dynamic resistances.

Reference Books:

Lab Manual in Physics Vol-I & II, R.S. Mittal & S. Singal.

ENGINEERING CHEMISTRY
DCOC-214

LIST OF EXPERIMENTS

1. To determine the purity percentage of oxalic acid in a given impure mixture.

2. To analysis a mixture of NaOH and KOH (given a solution contacting 2.5g mixture of NaOH and KOH per litre).

3. To estimate the calcium and magnesium hardness in the given water sample.

4. To estimate the Chloride ion (Cl^-) in the given water sample.

5. To estimate the free Chlorine (Cl_2) in the given water sample.

6. To estimate the dissolved Oxygen (D.O) in the given water sample.

7. To estimate the Alkalinity in the given water sample.

8. To estimate the temporary, permanent and total hardness in the given water sample by EDTA method.

9. To determine the viscosity of a lubricating oil by Redwood Viscometer.

10. To determine the moisture percentage in a given coal sample.

PROGRAMMING IN C
DCO-215

LIST OF PRACTICALS

1. **Objective(s):** To be familiar with different data types, Operators and Expressions in C.
   List of Programs:
   a) Write a C program to calculate area and circumference of a circle.
   b) Write a C program to perform addition, subtraction, division and multiplication of two numbers.
   c) Write C program to evaluate each of the following equations. (i) $V = u + at$ (ii) $S = ut+1/2a$ (iii) $T=2*a+\sqrt{b}+9c$
   d) Write a program to input name, rollno and marks obtained by a student in 4 subjects out of 100 marks each and display the name, rollno with percentage score secured.
   e) Write a program to display the size of every data type using "sizeof" operator

2. **Objective(s):** To understand the programming knowledge using Decision Statements (if, if-else, if-else-if ladder, switch and goto).
   List of Programs:
   a) Write a program to print whether a given number is even or odd.
   b) Write a program to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd.
   c) Write a program to compute grade of students using if else adder. The grades are assigned as follows:

Marks	Grade
marks<50	F
50≤marks< 60	C
60≤marks<70	B
70≤marks<80	B+
80≤marks<90	A
90≤mars≤ 100	A+

   d) Write a program to check whether the entered year is leap year or not (a year is leap if it is divisible by 4 and divisible by 100 or 400.)
   e) Write a program to find whether a character is consonant or vowel using switch statement.

3. **Objective(s):** To understand the programming using Loop & nested loop Statements (for, while, do-while).

List of Programs:
   a) Write a program to print positive integers from 1 to 100.
   b) Write a program to reverse a given integer.
   c) Write a program to generate Fibonacci series
   d) If a four-digit number is input through the keyboard, write a program to obtain the sum of the first and last digit of this number.
   e) Write a program to find GCD (greatest common divisor or HCF) and LCM (least common multiple) of two numbers.

4. **Objective(s):** To design the pattern using nested loop statements.

List of Programs:
   a) *
      * *
      * * *
      * * * *
      * * * * *

   b) 1
      2 2
      3 3 3
      4 4 4 4
      5 5 5 5 5

   c) 1
      1 2
      1 2 3
      1 2 3 4
      1 2 3 4 5

   d) 1
      1 2 1
      1 2 3 2 1
      1 2 3 4 3 2 1
      1 2 3 4 5 4 3 2 1

5. **Objective(s):** To understand programming using different dimensions of Array.

List of Programs:
   a) Write a program to insert 5 elements into an array and print the elements of the array.
   b) Write a Program to find the largest and smallest element in array
   c) Write a program for addition of two matrices of any order in C.

d) Write a Program to multiply two m X n order Matrices.
e) Write a program to accept a string and count the number of vowels present in this string.

6. **Objective(s):** To understand function programming, its types and function-call.
   List of Programs:
   a) Write a program to add, subtract, multiply and divide two integers using user defined type function with return type.
   b) Write a program to swap two integers using call by value and call by reference methods of passing arguments to a function.
   c) Write a program to calculate factorial of a number using recursion.
   d) Write a C program to find power of any number using recursion.
   e) Write a C program to check whether a number is even or odd using functions.

7. **Objective(s):** To understand programming with Pointer, String and Function call by reference.
   List of Programs:
   a) Write a program to find biggest among three numbers using pointer.
   b) Write a program to compare two strings using pointers.
   c) Write a program to input and print array elements using pointer.

8. **Objective(s):** To understand programming with Structure.
   List of Programs:
   a) Write a program to store information of 5 students in structure and display it.
   b) Write a program to read RollNo, Name, Address, Age & average-marks of 12 students in the BCT class and display the details from function.

9. **Objective(s):** To understand data files and file handling in C.
   List of Programs:
   a) Write a program to illustrate how a file stored on the disk is read.
   b) Write a program to create a file called emp.rec and store information about a person, in terms of his name, age and salary

COMPUTER ORIENTED NUMERICAL METHODS
DCO-301

UNIT-I

Introduction: Number and their accuracy, Computer Arithmetic, Mathematical Preliminaries, Errors and their Computation, General error formula, Error in a series Approximation. Solution of Algebraic and Transcendental Equation: Bisection Method, Iteration Method, Method of false Position, Newton-Raphson method, Methods of finding complex roots, Muller's method, Rate of Convergence of Iterative methods, Polynomial Equations.

UNIT-II

Interpolation: Finite Differences, Difference Tables, Polynomial Interpolation: Newton's forward and backward formula, Central Difference Formulae: Gauss forward and backward formula, Sterling's, Bessel's formula, Interpolation with unequal intervals: Lagrange's Interpolation, Newton Dividend difference formula, Hermite's Interpolation.

UNIT-III

Numerical Integration and Differentiation: Introduction, Numerical differentiation, Numerical Integration: Trapezoidal rule, Simpson's 1/3 and 3/8 rule, Boole's rule, Waddle's rule.

UNIT-IV

Solution of differential Equations and Statistical Computation: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta Methods, Predictor Corrector Methods Frequency chart, Curve fitting by method of least squares, fitting of straight lines, Polynomials, exponential curves Data fitting with cubic splines.

OBJECT OREINTED PROGRAMMING
DCO-302

UNIT- I

Structured Verses Object Oriented Development, Elements of Object-Oriented Programming, Introduction to Objects, Classes, Encapsulation and data abstraction, Inheritance Polymorphism, Overloading. C++ Data types, Variables, Operator and expression. Statements and Blocks, if statement, Loops, switch statements.

UNIT- II

Introduction, Classes, Class definition, Class member, member function, Public and Private Variables, Derived Classes, Constructors and Destructors, Exception Handling.

UNIT- III

Scope of Variables, Inline function, Friend function, Friend class, Parameter passing. Inheritance, types of inheritance, Virtual functions.

UNT- IV

Polymorphism, Overloading, Operator Overloading of Unary and Binary operators, Function Overloading. Templates, File Handling and Graphics.

Textbooks/Reference Books:

- Object Oriented Programming with C++ by E-Balagurusamy; Mc-Graw Hill Education.
- Object Oriented Programming in C++ by Robert Lafore; SAMS Publication.
- Object Oriented Programming with C++ by Yashavant P. Kanetkar; B.P.B Publication.

SIGNALS AND SYSTEMS
DEE-303

UNIT - I SIGNALS & SYSTEMS

Transformation of Independent Variable, Continuous and Discrete Time Signals, Systems, Properties of the System, Linear Time-Invariant Systems, Representation of Signals and Block Diagram Representation, simple problems.

UNIT II MODULATION

Continuous Time Sinusoidal Amplitude, Modulation and its Applications, Pulse Amplitude Modulation and Time Division Multiplexing Single Sideband Amplitude Modulation, Continuous Time Frequency Modulation, Simple Problems.

UNIT-III SAMPLING

Representation of a Continuous Time Signal, Recognition of a Signal, Effect of Under sampling, Discrete-Time Processing of Continuous-Time Signals, Sampling in Frequency Domain, and Discrete Time-Signals, Discrete Time Decimation, and Interpolation, Simple Problems

UNIT-IV LINEAR FEEDBACK SYSTEMS

Some Applications and Consequences of Feedback, Root Locus Analysis, Nyquist Stability Criterion, Gain and Phase Margins, Simple Problems.

COMPUTER ARCHITECTURE
DCO-304

UNIT-I

Central Processing Unit, General Register and Stack Organization, Instruction formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC, Register Transfer language, Register Transfer Bus and memory transfers, Arithmetic Microoperations, logic microoperations, shift microoperations, Arithmetic logic shift unit, Instruction codes, Computer Registers, Computer instructions –Instruction cycle.

UNIT- II

Computer Arithmetic, Addition and Subtraction, Multiplication and Division Algorithms, Floating Point and Decimal Arithmetic operations, Booth Multiplication Pipelining-Arithmetic, Instruction and Arithmetic Pipelining, Vector Processing, Array Processors.

UNIT -III

Memory Organization, Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Cache and Virtual Memory, Control memory, Address sequencing, design of control unit, Hard wired control. Micro-programmed control

UNIT-IV

Input-Output Organization, Peripheral devices, I/O Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access, I/O Processor-Serial Communications.

DIGITAL ELECTRONICS
DEL-306

UNIT-1 NUMBER SYSTEMS

Binary number system, Binary to decimal conversion and decimal to binary conversion, octal and hexadecimal number system, Representation of Negative numbers, I's complement and 2's complement representation. **Binary Codes:** BCD code, Grey code and excess -3 codes.

UNIT-2   LOGIC GATE

Symbol and truth table of AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR gates. Application of NAND and NOR gates as Universal gate. **Boolean Algebra:** Laws and theorems of Boolean algebra and their application, De-Morgan's theorem, minimization of logic expression by using Boolean laws, theorem and K-map.

UNIT-3 COMBINATIONAL CIRCUITS

Half and full Subtractor, multiplexer and demultiplexer, Encoder and decoder. **Flip Flops:** Difference between Combinational and sequential circuits, Introduction of RS flip flop, JK flip flop and D-type flip flop.

UNIT-4 SHIFT REGISTERS

Shift Register, buffer register, serial and parallel shift register. **Counters:** Synchronous and Asynchronous Counters.

UNIT-5 LOGIC FAMILIES

Introduction to Logic Families and their types, Various characteristics of logic families.

A/D and D/A Converters: Introduction to Analog to Digital Converter and Digital to Analog Converters, Types of Analog to Digital Converter and Digital to Analog Converters.

Text Books:

1. VK Puri: Digital Electronics
2. RP Jain: Modern Digital Electronics

Reference Books:
1. Malvino: Digital Computer Electronics
2. BR Gupta & V Singhal: Digital Electronics

OBJECT ORIENTED PROGRAMMING LAB.
DCO-312

LIST OF PRACTICALS

1. Write Programs in C++ to Implement Various Control Statements.

   a. if…. else statement   b. while loop   c. do…. while loop

   d. for loop   e. switch statement

2. Write a Program in C++ to Understand Structure.

3. Write a Program in C++ to Understand Functions.

4. Write a Program in C++ to Understand Pointer Arithmetic.

5. Write Programs in C++ to Understand different function call mechanism.

   a. Call by Value   b. Call by reference

6. Write a Program in C++ to Understand Classes and Objects.

7. Write a Program in C++ to Understand Inline Functions.

8. Write a Program in C++ to Understand Constructors & Destructors.

9. Write a Program in C++ Using Class to Demonstrate the Use of "this" Pointer.

10. Write Programs in C++ to Implement all types of Inheritance.

11. Write Programs in C++ to Understand Operator Overloading.

12.Write Programs in C++ to Understand Virtual Functions and Dynamic Polymorphism.

13. Write Programs in C++ to Understand Friend Function and Friend Class.

14. Write a Program in C++ to Understand Class Templates.

15. Write a Program in C++ to Understand Exception Handling.

COMPUTER WORKSHOP LAB.
DCO-314

LIST OF PRACTICALS

1. Discuss about various display devices and write in detail about:

   a. CRT

   b. LCD

   c. LED

2. Study and discuss in detail about the following types of printers:

   a. Laser Printers

   b. Inkjet Printers

   c. Dot Matrix Printers

3. Discuss in detail about Motherboard and its components.

4. Write in detail about physical observation and analysis of the Hard disk and its components.

5. Study and discuss in detail about the Processors and its various types.

6. Write in detail about physical observation and analysis of the RAM and its components. Also discuss about its various types.

7. Study and discuss in detail about the BUS architecture.

8. Study and discuss in detail about NIC (Network Interface Card).

9. Study and discuss in detail about MODEM.

COMPUTER SYSTEM & MAINTENANCE LAB.
DCO-315

LIST OF PRACTICALS

1. Study the concepts of basic computer maintenance.

2. To know and understand the features available in BIOS Setup utility and common errors in POST. (Power On Self Test).

3. Write down the steps involved in the installation of Windows Operating System into your machine.

4. Explain how partitions are created and also create partition and install Linux Operating System on the same machine

5. Write down the procedure to boot your system from an external hard drive.

6. Write down the steps involved in partitioning and formatting of hard disk drive.

7. Study the basic troubleshooting techniques in computer system and various peripheral devices.

8. Write down the steps involved in installing and uninstalling application software in Microsoft Windows environment.

9. Create a Workgroup based network using Windows operating system.

10. Write down the steps involved in sharing of a local printer.

DIGITAL ELECTRONICS LAB.
DEL-316

LIST OF EXPERIMENTS

1. To verify the truth tables of basic logic gates.

2. To verify the truth tables of universal logic gates.

3. To design and verify the truth tables of basic logic gates by using NAND gates.

4. To design and verify the truth table of basic logic gate by using NOR gates.

5. To design and verify truth table of the Ex-OR gate by using NAND gates.

6. To design and verify the truth table of Ex-NOR gate by using NOR gates.

7. To design and verify the circuit and truth table of Half Adder.

8. To design and verify the circuit and truth table of a Full Adder.

9. To design and verify the circuit and truth tables of a Half Subtractor.

10. To design and verify the circuit and truth table of Full Subtractor.

COMMUNICATION SKILLS -II
DCOS-401

UNIT	TOPIC	MARKS
I.	Reading *a. Comprehension (Advanced)*	10
II.	Grammar *a. Direct & Indirect*	5
III.	Writing *a. Dialogue* *b. Paragraph*	15
IV.	Speaking - I *a. Presentation Skills*	15
V	Speaking - II *a. Interview*	15

DATABASE MANAGEMENT SYSTEM
DCO-402

UNIT- I

An overview of database management system, database system Vs file system, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure.

UNIT- II

ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.

UNIT- III

Relational data Model and Language: Relational data model concepts, integrity constraints: entity integrity, referential integrity, keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus, Introduction to SQL: Characteristics of SQL, Advantage of SQL, SQL data types and literals, Types of SQL commands, Aggregate functions, Insert, update and delete operations, Joins, Unions, and intersections in SQL.

UNIT- IV

Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependences, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

Reference/Text Books:

1. Database System Concepts- Henry F Korth, Abraham Silberschatz, S. Sudurshan, McGraw-Hill.
2. Database Management Systems - Raghu Ramakrishnan and Johannes Gehrke. McGraw-Hill.
3. Schaum's Outline of Fundamentals of Relational Databases (Schaum's Outline Series) by Ramon Mata-Toledo and Pauline Cushman

OPERATING SYSTEM
DCO-403

UNIT-I

Introduction: Operating System and Function, Evolution of Operating System, Batch, Interactive, Time Sharing and Real Time System, Operating System Structure: System Components, System Structure.

UNIT-II

Process Concept, Critical Section Problem, Synchronization, Semaphores, Process Generation, Process Scheduling. CPU Scheduling: Scheduling Concept, deadlock Characterization, Prevention, Avoidance and Detection, Recovery from Deadlock

UNIT–III

Memory Management: Multiprogramming with Fixed Partition, Multiprogramming with Variable Partition, Multiple Base Register, Paging, Segmentation, Paged Segmentation, Virtual memory Concept, Demand Paging, Performance, Paged Replaced Algorithm, Allocation of Frames, Thrashing,

UNIT-IV

File System: File Concept, File Organization and Access Mechanism, File Directories, File Sharing, Implementation Issues, Disc scheduling.

DATA STRUCTURES
DCO-404

UNIT-I

Concepts of data type and data structures, array and pointer variables: 1-D array, 2-D array, view of array and pointers at implementation level, concept of dynamic variable and implementation, Introduction to Stacks and Queues.

UNIT-II

Introduction to Pointers, self referential Structures, dynamic memory allocation, Study of linked list, Circular list, doubly linked list, Stack, queue; Sequential and linked list implementation of stack and queue.

UNIT-III

Introduction to complexity, Concept of divide and conquer, sorting and searching algorithms and their efficiency consideration; Sorting and searching algorithms: Insertion sort, bubble sort, selection sort, quick sort, linear search, binary search algorithm.

UNIT-IV

Non linear data structure: Graph, tree: binary tree, complete binary tree, binary search tree; Tree traversal algorithms: inorder, preorder, postorder traversal; graph traversal algorithms: depth first search, breadth first search.

Reference Books:

- Classic Data Structures by Debasis Samanta; PHI.
- Data Structures by Seymour Lipschutz, Schaum's Outlines; Mcgraw Hill publication.
- Data Structures using C by Aaron M. Tanenbaum, yedidyah Langsan, and Moshe J. Augenstein; Pearson Publication

MICROPROCESSOR & MICROCONTROLLER
DEL-405

UNIT-1 ARCHITECTURE AND PROGRAMMING MODEL:

Architecture block diagram, register and flags, Interrupts, Main future of 8085.address space portioning, address decoding concept timing diagram for fetch, read write operation.

UNIT-2 INSTRUCTION SET:

Instruction classification of 8085: Concept of instruction. opcode and operand, single, two- and three-byte instruction according to operation .data transfer group, arithmetic and logical group, stacks control, transfer group, assembly language and machine language formats. Assembly language programming concepts, programming exercises.

UNIT-3 INTERRUPTS & I /O:

Synchronous and Asynchronous data transfer DMA data transfer Mask able and non-mask able interrupts, vectored interrupt scheme of 8085.RIM & SIM instructions concept of interfacing, interfacing slow peripherals, I/O ports

UNIT-4 MICROCONTROLLER & PERIPHERAL INTERFACE CHIPS:

Features, block diagram, operating modes, microcontroller 8085, interfacing chip PPI8255.DMA controlled 8257.programmable interrupt controllers 8259, keyboard and display interface chip 8279 & programmable interval timer 8253.

UNIT-5 INTERFACING REAL-WORLD SIGNALS:

ADC& DAC concepts, interfacing 8- bit ADC, interfacing 8-bit DAC development tools. MDS & its role in system development. Logic analysers & its uses.

DATABASE MANAGEMENT SYSTEM LAB.
DCO-412

LIST OF PRACTICALS

1. Write in detail about the CREATE command. Create a database for College using the following Tables

   Table Name: Faculty   Attributes: Faculty ID, Faculty Name, Qualification, Department ID

   Table Name: Student   Attributes: Student ID, Student Name, Branch, Marks

   Table Name: Department   Attributes: Department ID, Department Name

2. Write in detail about the INSERT command. Insert data into the created tables.

3. Write in detail about the SELECT command. Query the created database using the select command. Describe the DISTINCT, WHERE and ORDER BY clauses used with select command and show their usage.

4. Write in detail about the following operators and show their usage on the created database

        (a). IN, NOT IN   (b). BETWEEN, NOT BETWEEN

        (c). LIMIT   (d). IS NULL, IS NOT NULL

        (e). LIKE, NOT LIKE

5. Write in detail about the JOIN command. Show its usage on the created database using different types of joins used in MySQL i.e.

        (a). CROSS JOIN   (b). INNER JOIN

        (c). LEFT JOIN   (d). RIGHT JOIN

6. Write in detail about the SET operations including UNION, MINUS and INTERSECT. Show their usage on the created database.

7. Write in detail about the AGGREGATE functions including COUNT, SUM, MAX, MIN and AVERAGE. Show their usage on the created database.

8. Write in detail about the use of ARITHMETIC operators on SQL queries. Show the usage of '+', '-', '*' and '/' on the created database.

9. Write in detail about the GROUP BY clause. Show its usage on the created database.

10. Implementation of different types of constraints in SQL.

11. Create a University Database and implement the relationships between the various tables thus created. (Introduction, Functional requirements, design, data feeding and ER diagram, SQL Queries).

12. Create a sample database to explain the concept and implementation of Normalization. (1NF, 2NF, 3NF, BCNF).

OPERATING SYSTEM LAB.
DCO-413

LIST OF PRACTICALS

1. Study and explain the types of operating systems (their types with structure, functionality, dependencies, application software with their differences).
2. Explain in Detail the evolution of Operating System over the past years.
3. List any 20 internal and external DOS commands.
4. List any 20 Unix commands.
5. Installation of any one of the operating system.
6. Present the output of following CPU Scheduling algorithms.
   a. FCFS
   b. SJF
   c. Priority
   d. Round Robin
7. To implement first fit, best fit algorithm for memory management.
8. Implement file allocation techniques (Linked, Indexed or Contiguous).
9. Present the output of following Page Replacement Algorithms.
   a. FIFO
   b. LRU
   c. OPTIMAL
10. Simulate Bankers algorithm for Deadlock Avoidance.
11. Simulate Bankers Algorithm for deadlock Prevention.

DATA STRUCTURES LAB.
DCO-414

LIST OF PROGRAMS

1. Write a program to perform the following operations related to an array:
   - i. To insert at first, middle and last position
   - ii. To delete from first, middle and last position.

2. Write a program to perform the following operations on 2-D Array:
   - i. To print all the diagonal elements
   - ii. To print the sum of each row
   - iii. To print the sum of each column

3. Write a program to create a linked list by inserting nodes at:
   - i. A particular position in the linked list
   - ii. After a key value in the linked list

4. Write a program to delete a node from a linked list from:
   - i. A particular position in the linked list
   - ii. After a key value in the linked list

5. Write a program for the implementation of basic operations of stack.

6. Write a program for the implement of basic operations of queue.

7. Write a program to find the value of level of each node of a binary tree.

8. Write a program to check whether the graph is directed or undirected.

9. Write a menu driven program to implement linear search and binary search.

10. Write a menu driven program to implement bubble sort, selection sort and insertion sort.

MICROPROCESSOR PROGRAMMING LAB.
DEL-415

LIST OF EXPERIMENTS

1. To add two 8-bit numbers in which the sum should be in 8-bit.

2. To add two 8-bit numbers in which the sum should be with carry.

3. To add two 16-bit numbers in which the sum should be in 16-bit.

4. To subtract two 8-bit numbers in which the difference should be in 8-bit.

5. To write a program for finding the 2's complement of a 16-bit number.

6. To subtract 8-digit decimal numbers.

7. To find the larger of two numbers.

8. To find the smaller of two numbers.

9. To write a program for finding the largest number from the series of numbers.

10. To find larger numbers in a data array.

COMPUTER GRAPHICS
DCO-501

UNIT-I

Introduction to Computer Graphics, Graphics hardware, I/o devices, Display devices Random scan displays, Raster scan displays.

UNIT-II

Points and lines, Line drawing algorithms, Circle generating algorithms, Mid-point circle generating algorithm, Graphic standards, applications, simple and symmetric DDA, Bresenham algorithm.

UNIT-III

Transformations: Basic transformation, Matrix representations and homogenous coordinates. Windowing and Clipping: Viewing pipeline, viewing transformations, 2-D Clipping Algorithms-Line clipping algorithms such as Cohen Sutherland line clipping algorithm, Polygon clipping – Sutherland Hodgeman polygon clipping.

UNIT-IV

Three Dimensional: 3-D geometric primitives, 3-D Object representation, 3-D Transformation, 3-D viewing, projections, 3-D Clipping.

Reference/Text Books:

1. Computer Graphics C version, Donald Hearn & Pauline Baker - Pearson Education.
2. Schaums Outline of Computer Graphics, Zhigang Xiang, Roy A. Plastock - McGraw-Hill India

WEB TECHNOLOGY
DCO-502

UNIT-I

Introduction to web, protocols governing the web, web development strategies, web applications, web project, web team, Writing Web Projects, Identification of Objects, Target Users, Web Team, Planning and Process Development.

UNIT-II

Introduction to Hyper Text Markup Language (HTML), HTML elements, Tables, Images, Forms, Frames, XHTML syntax and Semantics, extensible Markup Language (XML), XML schemes, Object Models, Presenting XML, Using XML Processors, element, attributes, entity declarations, DTD (Document type definition) files and basics of Cascading Style Sheet (CSS List).

UNIT-III

Java script: Introduction to Java Script, Object in Java Script, Dynamic HTML with Java Script, documents, forms, statements, functions, objects, Event and event handling; introduction to AJAX, VB Script, CGI, PERL.

UNIT-IV

Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, introduction to Apache web server. Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall, Web Servers, Web server and its deployment, Web client, services of web server, mail server, proxy server, multimedia server.

DATA COMMUNICATION & COMPUTER NETWORKS
DCO-503

UNIT-I

Data Communication: Data Transmission, Analog Transmission, Digital Transmission, Data Encoding: Digital Data- digital signals, Digital Data- analog signals, Analog Data- Digital Signals, Analog Data- Analog Signals, Synchronous and Asynchrous Transfer. Transmission media: Twisted pair, Coaxial Cable, Optical Fibers, Wireless Transmission, Microwave, Radio Waves, and Infrared.

UNIT-II

Introduction to Computer network: Goals and Applications of Networks, Network structure and architecture, Protocols, OSI reference models, TCP/IP protocol suit. Data link control and protocol: Flow Control - Stop and Wait, Sliding window, Error Detection, Error Control, HDLC.

UNIT-III

LAN architecture, LAN topologies - BUS/Tree LAN, Ring LAN, Star LAN, Wireless LAN, Ethernet and Fast Ethernet (CSMS/CD), Token ring and FDDI. Network layer: Introduction, Routers, Routing Algorithms, Congestion control algorithm, Addressing, Internet working.

UNIT-IV

Transport Layer protocols, Transport services, TCP, UDP. Wide area networks, Circuit switching, Packet switching, Frame relay, ATM, ISDN. Application Layer: domain name system, simple network management protocol, File Transfer, Access and Management, Electronic mail, HTTP, WWW, web browsing, multimedia file transfer.

SOFTWARE ENGINEERING
DCO-504

UNIT-I

Introduction to Software Engineering, software components, software characteristics, software crisis, software processes, similarity and differences from conventional engineering processes, software quality attributes. Software development life Cycle (SDLC) models: Waterfall model, Prototype model, Spiral model, Evolutionary development models, Iterative enhancement models.

UNIT-II

Requirements Elicitation: Interviews, brainstorming sessions, the use case approach.

Requirement Analysis: Data flow diagram, data dictionaries, entity-relationship diagram.

Requirements documentation: Nature of SRS, characteristics of good SRS, organization of the SRS and case study.

UNIT-III

Size estimation, cost estimation, static, single variable models, constructive cost models (COCOMO), software risk management, software risk assessment and estimation models (SRAEM). Basic concept of software design, Modularization, flow charts, coupling and cohesion measures, Top –Down and Bottom-Up design.

UNIT-IV

Software testing: Testing objectives, testing process, various terminologies, functional testing, Structural testing: path testing, cyclomatic complexity, graph matrices, data flow testing and mutation testing. Levels of testing: unit testing, integration testing and system testing and software quality.

JAVA PROGRAMMING
DCO-505

UNIT-I

Java Features, Constant, Variables and Data Types, Scope of variable, Type casting, standard default values, Operator and Expression, Decision making and Looping: The While statement, the do statement, the for statement, Jumps in Loops, Labelled Loops. Classes, Object and Methods Defining a class, creating object, accessing class members, Constructor, Methods Overloading, Static Variables.

UNIT-II

Inheritance: Extending a Class and implementing interfaces, Overriding Methods, Final variable and Methods, Final Classes, Abstract method and Classes, Visibility Control, Array, Strings and Vectors, String, Wrapper Classes.

UNIT-III

Packages, Multi-Threading: Extending a thread class, Life cycle of thread, using thread method, Thread exceptions, Thread priority, Synchronization, implementing a 'Runnable' Interface, Managing Errors and Exceptions, Types of errors, Exception, Multiple catch statement, using finally statement.

UNIT-IV

Applet Programming: Local and remote applets, building applet code, Applet life cycle, Creating an Executable Applet, designing a Web page, Applet tag, Adding Applet to HTML file, Running the Applet, passing parameter to applet Graphics Programming: The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, using control loops in Applets, Drawing Bar charts.

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COMPUTER GRAPHICS & MULTIMEDIA LAB.
DCO-511

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LIST OF PROGRAMS

1. Classification of built-in-graphics functions defined in <graphics.h> header file.

2. Write a program in C to make a scenery according to your choice with the help of the built-in-graphics functions.

3. Write a program in C to implement Bresenham's line drawing and DDA algorithm, and compare the results with each other.

4. Write a program in C to implement mid-point circle algorithm.

5. Write a program in C to implement Cohen Sutherland line clipping algorithm.

6. Write a program in C to translate 2D and 3D object.

7. Write a program in C to scale the 2D and 3D object with origin and pivot point.

8. Write a program in C to rotate a 2D and 3D object with origin and pivot point.

9. To create a 3D scene using OpenGL.

10. To make a short film using any Multimedia Tool.

WEB TECHNOLOGY LAB.
DCO-512

LIST OF PROGRAMS

1. Classification of HTML Tags.

2. Design a web page using HTML Tags.

3. Design a web page to display the contents of the Applied Mathematics paper using HTML Tags.

4. Design three different web pages using CSS and link it with each other.

5. Design three frames to show the output of Program No. 2, 3, and 4.

6. Design a form to store the information of Computer Engineering –V Semester students.

7. Write a program in JavaScript to validate a form that you have designed in Program No. 5.

8. Write a program in JavaScript to sort the data in ascending and descending order.

9. Design a web page to handle the form using PHP.

10. Write a program in PHP to validate a form that you have designed in Program No.5. Compare the results with Program No. 7.

COMPUTER NETWORKS LAB.
DCO-513

LIST OF PRACTICALS

1. Study of different types of transmission medias.

2. Study and implement the cross-wired and straight cable connection of twisted pair cable using RJ 45 connector.

3. Study of Network Interface Card (NIC).

4. Study of the connecting devices Repeater and Hub.

5. Study of networking devices Bridge and 2- layer Switch.

6. Study of networking device Router.

7. Installation and configuration of network printer.

8. Study of IPV4 addressing scheme

   a. Classful addressing

   b. Classless addressing

JAVA PROGRAMMING LAB.
DCO-515

LIST OF PROGRAMS

1. Write the procedural steps to download, install and configure JDK (Java Development Kit) and execute the following programs
   a. Swapping the values of two variables without using third variable
   b. To check whether the number is prime or not.
   c. To generate Fibonacci sequence.
2. Write a program in Java to implement following TYPE casting:
   a. Narrowing Casting (Explicit)
   b. Widening Casting (Implicit)
3. Write a program in Java:
   a. To reverse a given number
   b. To print the following:
      i. Pascal's Triangle
      ii. Floyd's triangle
4. Write a program in Java to create and implement package.
5. Write a program in Java to implement inheritance.
6. Write a program in Java to implement interface.
7. Write a program in Java for Exception Handling.
8. Write a program in Java to implement Multithreading.

ADVANCED RDBMS
DCO-601

UNIT-I

Introduction to database model, database architecture, Relational Database, RDBMS, Database Normalization, schema.

UNIT-II

SQL, SELECT queries, Action Queries, Locking and Execution Plans, Query-Performance, Analysis, Database tuning, T-SQL/PL-SQL, XML, Views, procedure, function, trigger, advanced query techniques.

UNIT-III

Server administration, installing and configuring server, creating database, tables, indexing, snapshots, partitioning, security and policy-based management, data recovery-backup and restore, Failover Clustering, Database Mirroring, Log Shipping, Replication

UNIT-IV

Introduction to Universal Data Access, ODBC, RDO, OLE DB, DAO, ADO- Model, ADO .Net, Connection, Command, Properties Methods & events, Cursor Type, Updating and Batch Updating, Transaction Process, Database connectivity using ADO.NET with XML, Retrieving and Displaying Data using Forms & Grid, Data forms and reports.

VISUAL PROGRAMMING
DCO-602

UNIT-I

Introduction to .NET framework, window applications, CLR, JIT compiler, Languages under .NET, Introduction to Visual programming languages: VB, C#, Visual Java, Elements for GUI programming controls, properties, methods, events, VB and C# data types and languages syntax, event driven programming, WCF, WPF.

UNIT-II

Basic .NET concept, user interface design control, array, structure, conditions, loops, procedures, functions, object-oriented programming with VB.NET, classes, inheritance, polymorphism, namespace, error handling and exceptions, deploying window applications.

UNIT- III

ASP.NET, web applications with ASP.NET using C#, web form display data and user input, web form control variables and sessions, controlling website access, web form security, user login, automatic user account creation, database connectivity using ADO.NET with XML.

UNIT – IV

Introduction to ADO Technology - ADO vs. ADO.NET - Types of ADO.NET operations and Namespaces, System.Data, System.Data.Odbc, System.Data.OleDb , ADO.NET classes- xxxConnection classes, xxxCommand classes, xxxDataReader classes, xxxDataAdapter classes, Data tables, Data set, Data retrieval methods, Connected, Disconnected, Data Binding with controls.

INFORMATION SECURITY & CYBER LAW
DCO-603

UNIT-I

History of Information Systems and its Importance, basics, Changing Nature of Information Systems, Need of Distributed Information Systems, Role of Internet and Web Services, Information System Threats and attacks, authentication Service Security, Security Implication for organizations, Basic Principles of Information Security, Confidentiality, Integrity Availability and other terms in Information Security, Information Classification and their Roles.

UNIT-II

Physical Security- Needs, Disaster and Controls, Basic Tenets of Physical Security and Physical Entry Controls, Access Control- Biometrics, Factors in Biometrics Systems, Benefits, Criteria for selection of biometrics, Design Issues in Biometric Systems, Interoperability Issues, Economic and Social Aspects, Legal Challenges.

UNIT-III

Model of Cryptographic Systems, Issues in Documents Security, System of Keys, Public Key Cryptography, Digital Signature, Requirement of Digital Signature System, Finger Prints, Firewalls, Design and Implementation Issues, Policies. Network Security- Basic Concepts, Dimensions, Perimeter for Network Protection, Network Attacks, Need of Intrusion Monitoring and Detection, Virtual Private Networks- Need, Use of Tunneling with VPN, Authentication Mechanisms, Types of VPNs and their Usage, Security Concerns in VPN.

UNIT-IV

Security metrics- Classification and their benefits Information Security & Law, IPR, Patent Law, Copyright Law, Building Security into Software Life Cycle Ethics- Ethical Issues, Issues in Data and Software Privacy, Cyber Crime Types & overview of Cyber Crimes.

EMBEDDED SYSTEM
DCO-604

UNIT-I

Introduction to embedded systems, Categories of embedded systems, overview of embedded system architectures, specialties of embedded systems recent trends in embedded systems, Communication interfaces: RS232/UART, RS422/RS485.

UNIT-II

Survey of software Architectures: Round Robin, Round Robin with interrupts, Function Queue scheduling Architecture, RTOS Architecture, Architecture selection, Introduction to RTOS, Task and task states, Task and data, Semaphore and shared data, More operating system services, Message Queues, Mail boxes and pipes, Timer functions, events, Memory Management, Interrupt routine in an RTOS environment.

UNIT-III

Basic Design using an RTOS: Principle, Encapsulating Semaphores and Queues, Hard Real-time Scheduling considerations, saving memory space, saving power,

UNIT-IV

Embedded Software Development Tools Host and Target Machines, Linker/ Locator for Embedded Software, Getting Embedded Software into the target system, Debugging Techniques, testing on your host machine, Instruction set Simulators, The Assert Macro using Laboratory tools.

ARTIFICIAL INTELLIGENCE
DCO-605

UNIT-I

Introduction to Artificial Intelligence, Definitions, Goals of AI, AI Approaches, AI Techniques, Branches of AI, Applications of AI, Simulation of sophisticated & Intelligent Behavior in different area, problem solving in games, natural language, automated reasoning visual perception, heuristic algorithm versus solution guaranteed algorithms.

UNIT-II

Reasoning, Symbolic reasoning, Statistical reasoning, General problem solving, Search and control strategies, Exhaustive searches, Heuristic search techniques, Constraint satisfaction problems (CSPs), models.

UNIT-III

Knowledge representation, KR using predicate logic, KR using rules, First order predicate calculus, Horn Clauses, Introduction to PROLOG, Semantic Nets, Partitioned Nets, Minskey frames, Case Grammar Theory, Production Rules Knowledge Base, The Inference System, Forward & Backward Deduction.

UNIT-IV

Introduction to expert system, Knowledge acquisition, Knowledge base, working memory, Inference engine, Expert system shells, Explanation, Application of expert systems, Existing Systems (DENDRAL, MYCIN), domain exploration, Meta Knowledge, Expertise Transfer, Self Explaining System. Programming Language: Introduction to programming Language, LISP, PROLOG.

MOBILE COMPUTING
DCO-606

UNIT I

Wireless Communication Fundamentals: Introduction, Wireless transmission, Frequencies for radio transmission , Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread spectrum, MAC, SDMA, FDMA, TDMA, CDMA, Cellular Wireless Networks.

UNIT II

Telecommunication systems, GSM, GPRS, DECT, UMTS, IMT-2000, Satellite Networks – Basics, Parameters and Configurations, Capacity Allocation, FAMA and DAMA, Broadcast Systems, DAB, DVB.

UNIT III

Wireless LAN, IEEE 802.11- Architecture, services, MAC, Physical layer, IEEE 802.11a - 802.11b standards, HIPERLAN, Blue Tooth.

UNIT IV

Mobile IP, Dynamic Host Configuration Protocol – Routing, DSDV, DSR, Alternative Metrics, Transport and Application Layers: Traditional TCP – Classical TCP improvements, WAP, WAP 2.0.

ICT MANAGEMENT & ENTREPRENEURSHIP DEVELOPMENT
DCO-608

UNIT-I

Management, Different Functions of Management: Planning, Organizing, Co-ordination and Control, Information and Communication Technology (ICT), Information Systems (IS), ICT Management, Role of ICT and IS in modern industry. Project Management and Research Methodology, Project Management techniques and tools for managing any type of project, Case studies and live examples to illustrate the problems associated with badly managed projects.

UNIT-II

ICT Infrastructure and Services, methodologies and principles of ICT Service Management, IT Security and Audit, principles and policies governing information protection, Data Integrity and Control in a large installation, Data Centre Management- techniques for maintaining sanity, data currency, and system availability, Modern tools for running a Data Centre for corporate success, Standard for IT Service Management (ISO 20000).

UNIT-III

Concept of ethics, Concept of professionalism, Need for professional ethics, Code of professional ethics, typical problems of professional engineers. Factors determining motivation, Characteristics of motivation, Methods for improving motivation, Incentives, Pay, Promotion, Rewards, Job satisfaction and Job enrichment. Need of leadership, Function of a leader, Factors to be considered for accomplishing effective leadership, Manager as a leader, Types of production, Job, Batch and mass production, E.O.Q. (Economic order quantity), Concept of quality production, Concept of total quality management, JIT (Just in time), ISO-9000 & ISO-14000, Concepts of intellectual property rights & patents.

UNIT-IV

Concept of Entrepreneurship, Importance and need of entrepreneurship in context of prevailing employment conditions in the country, Qualities of successful entrepreneurs, Career options, scanning of business environment, Small scale sector, Types and forms of entrepreneurs and enterprises, Government assistance, Steps in setting up enterprises, Social responsibility of an entrepreneur. Project identification techniques, Selection of a project, conducting a market survey, Preparation of project report and project appraisal.

RDBMS LAB.
DCO-611

LIST OF PRACTICALS

1. Creation of an ER diagram for a university based on the specifications given.

   a) The university keeps track of each student name, student ID, Aadhaar number, address and phone, birth date and gender, department and degree. Both Aadhar number and student id has unique values for each student.

   b) Each department is identified by a name, department code, name of department head. Name and code have unique value for each department.

   c) Each course has a course name, course number, description, total strength, teachers and duration. The course number is unique for each course.

   d) Final grade report has a student, course, department, numeric grade and division attained.

2. Creation of an ER diagram for a bank based on the specifications given.

    A bank has many branches and each branch has many customers. A customer can open different type of accounts. A bank keeps track of the customers by his Aadhar, name, address and phone number. Age is used as a factor to determine if the customer is a minor or not. There are different types of loan each is identified by a loan number. Customers can take out different types of loans and all branches can give loans. Loans have a duration and interest rate.

3. Generation of SQL queries based on the database schema given.

4. Write a PL-SQL code snippet to illustrate the creation, updation, deletion and encryption of a Stored Procedure.

5. Write a PL-SQL code snippet to illustrate the implementation of Function.

6. Write a PL-SQL code snippet to illustrate the implementation of triggers.

7. Illustrating the basic database operations using JDBC (Java Database Connectivity) API.

VISUAL PROGRAMMING LAB.
DCO-612

LIST OF PROGRAMS

1. Introduction to the Microsoft Visual Studio .NET programming environment, properties, methods and events.

2. Introduction to C# programming language and write a program for the swapping of two numbers without using third variable in console environment.

3. Introduction to Data types and write a program to create Employee details using console application.

4. Write a program in C# .Net to find out the roots of quadratic equation, and also show the real and imaginary part of the roots if discernment is less than zero.

5. Write a program to design following pyramids using C# dot Net.

```
1 2 3 4 5                              *
 1 2 34                              * *
  1 2 3                             * * *
   1 2                            * * * *
    1                           * * * * *
```

6. Write a program in C# dot Net to sort an Array of n elements. Also, show the number of swapping occurred in sorting process.

7. Write a program to create list for n number of students using the concept of "List".

8. Write a program to search the name of the student in an array using "for each loop".

9. Design a Login form using basic form controls with proper validations in C# .Net (login credentials are stored in an array).

10. Introduction to Visual Basic (VB) dot Net and write a program for currency converter.

11. Design a Microsoft Windows simple calculator using graphical user interface in VB dot Net.

12. Extend the simple calculator to Scientific Calculator like Microsoft Windows Scientific Calculator using VB dot Net.

13. Introduction to Active Server Pages (ASP) dot Net and create the Master page to display resume contents.

14. Study database connectivity in ASP.Net and write a code to fetch the data from data base.

15. Design a student details from in ASP .net to add, edit and delete the information from the database.