NETAJI SUBHAS UNIVERSITY

SYLLABUS AND SCHEME OF EXAMINATION FOR

DIPLOMA
IN
Computer Science and Engineering
(CSE)

(Effective from academic session: 2023-26)

First Year

Subject Code	SEMESTER 1	Subject Code	SEMESTER 2
DIP101	Basic Physics	DIP201	Communication Skills-II
DIP102	Basic Chemistry	DIP202	Engg. Mathematics-I
DIP103	Basic Mathematics	DIP203	Applied Science
DIP104	Communication Skill-I	DIP204	Engg. Mechanics
DIP105	Engg. Graphics	DIP205	Engg. Drawing
DIP106	Computer Fundamentals	DIP206	Introduction to Software Package
DIP107L	COMPUTER LAB	DIP207L	Basic Workshop Practice
DIP108L	PHY LAB	DIP208L	CHEM LAB

Second Year

Subject Code	SEMESTER 3	Subject Code	SEMESTER 4
DIP301	Engg.Mathematics-II	DIP4CS01	OOPS using JAVA
DIP3CS02	Computer Programming Through 'C'	DIP4CS02	Database Management System
DIP3CS03	Introduction to Software Engineering	DIP4CS03	Data Structure Using 'C'
DIP3CS04	Digital Electronics	DIP4CS04	WP(HTML+CSS)
DIP3CS05	Operating System	DIP4CS05L	DBMS LAB
DIP3CS06L	OS LAB	DIP4CS06L	DS LAB
DIP3CS07L	C LAB	DIP4CS07L	JAVA LAB

Third Year

Subject Code	SEMESTER 5	Subject Code	SEMESTER 6
DIP5CS01	Advance WP(JS+web services)	DIP6CS01	Computer Graphics
DIP5CS02	Introduction to PHP	DIP6CS02	Introduction to Python
DIP5CS03	Environmental Science	DIP603	Management
DIP5CS04	Data Communication & Networking	DIP6CS04	Elective (Any One)

DIP5CS05L	PHP LAB	DIP6CS05	Project & viva (SIP)
DIP5CS06L	AWP LAB	DIP6CS06L	PYTHON LAB
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Elective - (i) Artificial Intelligence & Expert System
(ii) Multimedia
(iii) Software Project Management and Quality Assurance

SEMESTER - 1								
THEORY		PERIOD			Evaluation Scheme			Credit
CODE	NAME OF THE PAPER	LECTURES	TUTORIALS	PRACTICALS	IA	ESE	SUB-TOTAL	
DIP101	Basic Physics	3	1	0	30	70	100	4
DIP102	Basic Chemistry	3	1	0	30	70	100	4
DIP103	Basic Mathematics	3	1	0	30	70	100	4
DIP104	Communication Skill-I	3	0	1	30	70	100	4
DIP105	Engg. Graphics	3	1	0	30	70	100	4
DIP106	Computer Fundamentals	3	0	1	30	70	100	4
DIP107L	COMPUTER LAB	0	0	2	15	35	50	2
DIP108L	PHY LAB	0	0	2	15	35	50	2
							Total Credits:	28

IA = Internal Assessment, **ETE** = End Semester Exam

Program Outcome

After undergoing this programme, students will be able to:

PO1: Apply knowledge of mathematics, science and algorithm in solving complex Computer engineering problems.

PO2: Communicate effectively in English with others, Apply basic principles of mathematics and physics to solve engineering problems.

PO3: Use cutting tools, equipment and tools for fabrication of jobs by following safe practices at the workplace.

PO4: Work on different software for word processing, PowerPoint presentation, spreadsheets and communicate ideas electronically.

PO5: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

PO6: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

PO7: Recognize the need, and have the ability, to engage in independent learning for continual development as a Computing professional.

PO8: Demonstrate knowledge and understanding of computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO9: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

PO10: Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.

PROGRAMME SPECIFIC OUTCOMES

1. Understand the Opportunities and Challenges in Industry and to equip the students accordingly

2. Apply effectively the principles and methods of Computer Technology to a wide range of applications.

3. Apply advanced algorithmic and mathematical concepts to the design and analysis of software.

4. Get proficiency of computing, and to prepare themselves for a continued professional development.

COURSE OUTCOME

1. Identify and analyze the computing requirements of a problem and to solve those using computing principles.

2. Understand and Apply mathematical foundation, computing and domain knowledge for the conceptualization of computing model of problems.

3. Use suitable architecture or platform on design and implementation with respect to performance.

4. Apply the management principles with computing knowledge to manage the projects in multidisciplinary environments.

5. Identify opportunities and use innovative ideas to create value and wealth for the betterment of the individual and society.

6. Expertise in developing application with required domain knowledge

DERIVING CURRICULUM AREAS FROM LEARNING OUTCOMES OF THEPROGRAMME

The following curriculum area subjects have been derived from learning outcomes:

Sr. No.	Learning Outcomes	Curriculum Areas/Subjects
1.	Communicate effectively in English with others	− Communication Skill − Student Centered Activities
2.	Apply basic principles of mathematics and science to solve engineering problems	− Applied Mathematics − Applied Physics
3.	Use cutting tools, equipment and tools for fabrication of jobs by following safe practices at the workplace	Workshop Practice
4.	Work on different software for word processing, powerpoint presentation, spreadsheets and communicate ideas electronically	Fundamentals of Computer and Information Technology
5.	Assemble, troubleshoot and maintain computer and peripherals and install various software	Computer Architecture and Hardware Maintenance
6.	Use appropriate procedures for energy conservation and for preventing environmental pollution	Environmental Studies
7.	Design page layouts for digital and electronic publications by combining different media elements	Internet and Web Technology
8.	Write, compile and debug programmes usingdifferent programming constructs	Concept of Programming Using C
9.	Identify the software process model for specific software application and interpret different phases of software development life cycle	Software Engineering
10.	Create, manage and secure database	Database Management System
11.	Design, develop and host websites using internet technologies	Internet and Web Technology

12.	Plan and execute given task and project as a team member or a leader	Minor and Major Project Work
13.	Manage resources MIS/ERP effectively at theworkplace	Industrial Management and Entrepreneurship Development
14.	Implement OOPS concepts and data structure concepts.	Object Oriented Programming Using Java
15.	Use various functions and components of different operating systems	Operating Systems
16.	Set-up, diagnose problems, troubleshoot computer networks and maintain security of the networks	Data Communication and ComputerNetworks
17.	Write and debug simple as well as complexprogrammes in Python	– Web Development using HTML/CSS/JS – Computer Programming using Python
18.	Apply the acquired knowledge and skills in	– Minor Project Work
19.	solving live problems in the Computer and I.T. industry	– Major Project Work

Basic Physics (DIP101)

Programme Specific outcomes

1) After completion of program, students have deep knowledge of basic concepts in Physics.

2) Students are expected to acquire core knowledge in Physics, including the major premises of Mechanics and Properties of matter, Modern Physics, Classical and Quantum mechanics, Electricity and Magnetism, Digital Electronics, Optics, Relativity, Heat and Thermodynamic, Solid State Physics, Mathematical and Statistical physics, Atomic, Molecular and Nuclear Physics, Laser and nonconventional energy sources.

3) Students are also expected to develop written and oral communication skills in communicating physics-related topics.

4) Students should learn how to design and conduct an experiment and understand the basic physics behind it.

5) Students will develop the proficiency in the handling of laboratory instruments.

6) Students will realize and develop an understanding of the impact of Physics on society and apply conceptual understanding of the physics in real life.

Course Outcomes

1) The syllabi are framed in such a way that it bridges the gap between the plus two and 11th levels of Physics by providing a more complete and logical framework in almost all areas of basic Physics.

2) By the end of the first year (2nd semester), the students should have attained a common level in basic mechanics, Optics, Heat and Thermodynamics and Electricity and Magnetism. They were developed their experimental and data analysis skills through experiments at laboratories.

3) Students should have been introduced to powerful tools for tackling a wide range of topics in, Modern Physics, General Electronics, Mathematical and Statistical Physics and Solid State Physics They develop their experimental and data analysis skills through a wide range of experiments through practical at laboratories.

4) Students should have developed their understanding of core Physics by covering a range of topics in almost all areas of physics including Classical and Quantum Mechanics, Electrodynamics, Laser, Fiber optics, semiconductor devices and Non-conventional Energy Sources.

Unit -1: UNITS AND MEASUREMENTS

1.1 Need of Measurement in engineering and science, unit of a Physical quantity, requirements of standard unit, systems of units-CGS, MKS and SI, classification of physical quantities- Fundamental and Derived with their units.

1.2 Accuracy, Precision of instruments, Errors in measurement, Estimation of errors - Absolute error, Relative error and percentage error, significant figures. (Simple Problems).

1.3 Basic Measuring instruments - Vernier Caliper, Micrometer Screw gauge, inner & outer caliper thermometer, spherometer, and ammeter, voltmeter with their least count, range, accuracy and precision.

Standard reference surfaces used in engineering measurements- surface plate, angle plate, V-block, Engineer's square.

Unit -2: GENERAL PROPERTIES OF MATTER

2.1 Elasticity : Deforming force, Restoring force, Elastic and plasticbody, Stress and strain with their types, Hooke's law, Stress strain diagram, Young's modulus, Bulk modulus, Modulus of rigidity and relation between them(no derivation), (simple problems).

(Simple problems). Stress strain diagrams of H.T. Steel, Cast iron, Aluminum and Concrete, Ultimate and breaking stress, Factor of safety.

2.2 Surface Tension: Forces—cohesive and adhesive, angle of contact, shape of liquid surface in a capillary tube, capillary action with examples, relation between surface tension, capillary rise and radius of capillary (no derivation), (simple problem), effect of impurity and temperature on surface tension.

2.3 Viscosity : Velocity gradient, Newton's law of viscosity, coefficient of viscosity, streamline and turbulent flow, critical velocity, Reynold's number, (simple problems), Stokes law and terminal velocity (no derivation), buoyant (up thrust) force, effect of temperature & adulteration on viscosity of liquid.

Unit – 3: HEAT

3.1 Transmission of heat and expansion of solids: Three modes of transmission of heat - conduction, convection and radiation, good and bad conductor of heat with examples, law of thermal conductivity, coefficient of thermal conductivity (simple problems), expansion of solids-linear, aerial and cubical and relation between them.

3.2 Gas laws and specific heats of gases: Boyle's law, Charles's law, Gay Lussac's law, absolute temperature, Kelvin scale of temperature, general gas equation(no derivation) (simple problems), molar or universal gas constant, universal gas equation, standard or normal temperature and pressure (N.T.P.), specific heat of gases, relation between two specific heat (simple problems), thermodynamic variables, first law of thermodynamics (statement & equation only), isothermal, isobaric, isochoric & adiabatic processes (difference among these processes and equations of state) (simple problems).

Unit – 4: LIGHT

4.1 **Properties of light:** Reflection and refraction, Snell's law, physical significance of refractive index (simple problems), Total internal reflection, dispersion, diffraction and polarization of light (only introduction).

4.2 **Wave theory of light & Interference:** Newton's corpuscles theory of light, Huygens's wave theory, wave front, Types of wave front-spherical, cylindrical and plane Huygens's principle of propagation of wave front, Principle of superposition of waves, Interference of light, constructive and destructive interference, Young's experiment. Analytical treatment of interference, conditions for stationary interference pattern.

4.3 Laser: Light amplification by stimulated emission of radiation, properties of laser, spontaneous and stimulated emission, population inversion, pumping methods, He-Ne laser-construction & working, recording and reconstructing of hologram by using He-Ne laser.

Unit – 5: MODERNPHYSICS

5.1 **Photo electricity :** Plank's hypothesis, properties of photons, photo electric effect, laws and characteristics of photoelectric effect, Einstein's photoelectric equation,(simple problems), construction andworking of photoelectric cell, applications of photoelectric cell.
X-rays: Production of X-rays, types of X-ray spectra-continuous and characteristics, X-ray wavelength (simple problems), properties ofX-rays, applications of X-rays-engineering, medicine and scientific research work.

Text Books

	Titles of the Book	Name of Authors.	Name of the Publisher
(i)	Physics –I	V. Rajendran	Tata McGraw- Hill raw- Hill publication, New Delhi
(ii)	Applied Physics	Arthur Beiser.	Tata McGraw- Hill raw- Hill publication, New Delhi
(iii)	Engineering. Physics	R.K. Gaur & S.L. Gupta.	Dhanpat Rai Publication, New Delhi.
(iv)	Physics	Resnick and Halliday	-
(v)	Concept of Physics Part-I&II	H. C. Verma	-
(vi)	Basic Physics	Roshan Kr. Sinha	Foundation Publishing House

Basic Chemistry (DIP102)

Programme Specific Outcome

✓ Inorganic Chemistry

✓ Methodology and Perspectives of Sciences and General Informatics

✓ Organic Chemistry

✓ Physical Chemistry

✓ Practical papers– Inorganic, Volumetric, Organic, Physical and Gravimetric experiments

Programme outcome:

Chemistry introduces basic concepts, experimental techniques and applications of chemical sciences and introduces cheminformatics, Green chemistry and micro analytical techniques.

Unit -1

Atomic Structure : Definition of Atom, Fundamental Particles of Atom – their Mass, Charge, Location, Definition of Atomic no, Atomic Mass no., Isotopes & Isobars, & their distinction with suitable examples, Bohr's Theory, Definition, Shape & Distinction between Orbits & Orbitals, Hund's Rule, Filling Up of the Orbitals by Aufbau's Principles (till Atomic no.30), Pauli's exclusion principle, Valency – Definition, types (Electrovalency &Covalency), Distinction, Octet Rule, Duplet Rule, Formation of Electrovalent & Covalent Compounds e.g. Nacl, $CaCl_2$, MgO, $AlCl_3$, CO_2, H_2O, Cl_2, NH_3, C_2H_4, N_2, C_2H_2.

Unit -2

Electro chemistry: Definition Ionisation & Electrolytic Dissociation, Arrhenius Theory of Ionisation, Significance of the Terms Involved in Electrolysis. Such as Conductors, Insulators or Dielectrics, Electrolyte, Non Electrolyte, Electrolysis, Electrolytic Cell, Electrodes, Current Density, Temperature, Mechanism of Electrolysis – Primary & Secondary Reactions at Cathode & Anode, Electrochemical Series for Cations & Anions, Electrolysis of $CuSO_4$ Solution by using Cu Electrode & Platinum Electrode, Electrolysis of NaOH solution & fused NaCl, Faraday's first & second law of Electrolysis & Numericals, Electrochemical Cells & Batteries, Definition, Types (Primary & Secondary Cells), e.g. Construction, Working & Applications of Dry Cell / Laclanche Cell & Lead – Acid Storage Cell, Applications of Electrolysis such as Electroplating & Electro refining, Electrometallurgy & electrotyping Conductivity of Electrolyte – Ohms Law, Definition & Units of Specific Conductivity, Equivalent Conductivity, specific resistance.

Unit -3

Metals & Alloys Metals : Occurrence of Metals, Definition Metallurgy, Mineral, Ore, Gangue, Flux & Slag, Mechanical Properties, Processing ofOre, Stages of Extraction of Metals from its Ores in Detail i.e. Concentration, Reduction, refining. Physical Properties & Applications ofsome commonly used metals such as Fe, Cu, Al, Cr, Ni, Sn, Pb, Zn, Co, Ag, W.

Alloys: Definition of Alloy, Purposes of Making alloy Preparation Methods,Classification of Alloys such as Ferrous & Non Ferrous, examples. Composition, Properties & Applications of Alnico, Duralumin, Dutch Metal, German Silver / Nickel Silver, Gun Metal, Monel metal, Wood's Metal,Babbitt Metal.

Unit -4

Non Metallic Materials Plastics : Definition of Plastic, Formation of Plastic by Addition & Condensation Polymerisation by giving e.g. of Polyethylene & Backelite plastic Respectively, Types of Plastic,

Thermo softening& Thermosetting Plastic, with Definition, Distinction &e.g. Compounding of Plastics – Resins, Fillers, Plasticizers, Accelerators, Pigments, Engineering Applications of Plastic based on their Properties.

Rubber: Natural Rubber: Its Processing, Drawbacks of Natural Rubber, Vulcanisation of Rubber with Chemical Reaction. Synthetic Rubber: Definition, & e.g., Distinction Between Natural & Synthetic Rubber.

Thermal Insulating Materials: Definition, Characteristics & Applications of Glass, Wool, Thermocole, Asbestos, Cork.

Unit – 5

Environmental Effects (Awareness Level): Introduction, Definition,Causes of Pollution, Types of Pollution, Such as Air & Water Pollution.

Air Pollution : Definition, Types of Air Pollutions their Sources & Effects, Such as Gases, Particulates,

Deforestation, Radio Active Gases, Control of AirPollution, Air Pollution Due to Internal Combustion Engine &

Its Control Methods, Causes & Effects of Ozone Depletion & Green House Effects**.**

Water Pollution : Definition, Causes & Methods of Preventing Water Pollution, Types of Waste such as Domestic Waste, Industrial Waste, their Physical & Biological Characteristics, BOD, COD, Biomedical Waste & E– Waste, their Origin, Effects & Control Measures. Preventive Environmental Management (PEM) Activities.

Text Books:-

	Titles of the Book	Name of Authors.	Name of the Publisher
(i)	Engineering Chemistry	Jain & Jain	Dhanpat Rai and Sons
(ii)	Engineering Chemistry	S.S. Dara	S. Chand Publication
(iii)	Industrial Chemistry	B.K. Sharma	Goel Publication
(iv)	Environmental Chemistry & Pollution Control.	S.S. Dara	S. Chand Publication

Basic Mathematics (DIP103)

PROGRAMME OUTCOME

Formulate and develop mathematical arguments in a logical manner. Also when there is a need for information, the student will be able to identify, locate, evaluate, and effectively use that information for handling issues or solving problems at hand. Acquire good knowledge and understanding in advanced areas of mathematics and its applications.

PROGRAMME SPECIFIC OUTCOME

Will be able to apply critical thinking skills to solve problems that can be modelled mathematically, to critically interpret numerical and graphical data, to read and construct mathematical arguments and proofs, to use computer technology appropriately to solve problems and to promote understanding, to apply mathematical knowledge to a career related to mathematical sciences thus cultivating a proper attitude for higher learning in mathematics.

Unit -1
ALGEBRA
1.1 REVISION :
  1.1.1 Laws of Indices
  1.1.2 Formula of factorization and expansion((a^2-b^2), $(a+b)^2$ etc.)
  1.1.3 Laws of logarithm with definition of Natural and Common logarithm.

1.2 PARTIAL FRACTION:
  1.21 Definition of polynomial fraction proper & improper fractions and definition of partial fractions.
  1.2.2 To Resolve proper fraction into partial fraction with denominator containing non repeated linear factors, repeated linear factors andirreducible non repeated quadratic factors.
  1.2.3　To resolve improper fraction into partial fraction.

1.3　DETERMINANT AND MATRICES :Determinant
  1.3.1　Definition and expansion of determinants of order 2 and 3.
  1.3.2　Cramer's rule to solve simultaneous equations in 2 and 3 unknowns.
   Matrices
  1.3.3　Definition of a matrix of order m x n types ofmatrices.
  1.3.4　Algebra of matrices such as equality, addition, Subtraction, scalarmultiplication and multiplication.
  1.3.5　Transpose of a matrix.
  1.3.6　Minor, cofactor of an element of a matrix, adjoint of matrix andinverse of matrix by adjoint method.
  1.3.7　Solution of simultaneous equations containing 2 and 3 unknowns by matrix inversion method.
1.4　BINOMIAL THEOREM :
  1.4.1　Definition of factorial notation, definition of permutation andcombinations with formula.
  1.4.2　Binomial theorem for positive index.
  1.4.3　General term.
  1.4.4　Binomial theorem for negative index.
  1.4.5　Approximate value (only formula)

Unit -2
TRIGONOMETRY.
2.1 REVISION :
  2.1.1 Measurement of an angle (degree and radian). Relation Between degree and radian.
  2.1.2 Trigonometric ratios of 0^0 , 30^0 , 45^0 etc.
  2.1.3 Fundamental identities.
2.2 TRIGONOMETRIC RATIOS OF ALLIED, COMPOUND, MULTIPLE &SUBMULTIPLE ANGLES

(Questions based on numerical computations, which can also be done bycalculators, need not be asked particularly for allied angles).

2.3   FACTORIZATION AND DEFACTORIZATION FORMULAE:

2.4   INVERSE TRIGONOMETRIC RATIOS :
2.4.1 Definition of inverse trigonometric ratios, Principal values ofInverse trigonometric ratios.
2.4.2 Relation between inverse trigonometric ratios.

2.5   PROPERTIES OF TRIANGLE
2.5.1 Sine, Cosine, Projection and tangent rules (without proof)
2.5.2 Simple problems.

Unit -3
COORDINATE GEOMETRY
3.1 POINT AND DISTANCES :
3.1.1   Distance formula, Section formula, midpoint, centriod of triangle.
3.1.2   Area of triangle and condition of collinearity.

3.2 STRAIGHT LINE :
3.2.1   Slope and intercept of straight line.
3.2.2   Equation of straight line in slope point form, slope-intercept form, two-point form, two-intercept form, normal form. General equationof line.
3.2.3 Angle between two straight lines condition of parallel andperpendicular lines.
3.2.4 Intersection of two lines.
3.2.5 Length of perpendicular from a point on the line and perpendiculardistance between parallel lines.

3.3 CIRCLE :
3.3.1 Equation of circle in standard form, centre – radius form, diameterform, two – intercept form.
3.3.2 General equation of circle, its centre and radius.

Unit-4
VECTORS
4.1 Definition of vector, position vector, Algebra of vectors (Equality,addition, subtraction and scalar multiplication)
4.2 Dot (Scalar) product with properties.
4.3 Vector (Cross) product with properties.
4.4   **Applications**
4.4.1 Work done and moment of force about a point & line

Text Books:-

	Titles of the Book	Name of Authors.	Name of the Publisher
(i)	Mathematics for Polytechnic	S.P. Deshpande	Pune Vidyarthi Griha
(ii)	Trigonometry	S.L. Lonely	S. Chand Publication
(iii)	Higher Algebra	H.S. Hall & S.R. Knight	Metric edition, Book Palace, New Delhi
(iv)	College Algebra	Frc. G. Valles	Charotar Publication
(v)	Matrices	Aryes.	Schuam series, McGraw Hill
(vi)	Higher Engineering Mathematics	B.S. Grewal	Khanna Publications New Delhi
(vii)	Engineering Mathematics	S.S. Sastry	Prentice Hall of India

Communication Skill-I (DIP104)

Course Objectives:
1. To make the students confident of speaking in English impeccably and with utmost enthusiasm.
2. To familiarize the students with different styles of communication.
3. To enlighten the students with the seven concepts of communication.
4. To make the students understand the nuances of communication.
5. To train the students and make them comprehend various aspects of Interview skills.

Course Outcomes:
At the end of the course, the students would be able to:
1. Develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others.
2. Understand and practice different techniques of communication.
3. Practice and adhere to the 7Cs of Communication.
4. Familiarize with different types of Communication.
5. Understand and practice Interview Etiquettes.

Contents: Theory

Unit -1
Introduction: Definition, Objectives, Stages of Communication, Essentials of Good/Effective Communication, Benefits of Good Communication, Gaps in Communication, Communication and Information Technology. Business Correspondence: Structure of a Letter, Inquiry Letter, Sales Letter, Order Letter, Complaints, Complaint Handling, Telemarketing.

Unit -2
Government Correspondence: Noting, Routine Letter, Demi-Official Letter Memorandum, Circular, Telegrams, Newsletter. Writing Skills: Report Writing, Scientific Paper Writing, Writing Small Paragraphs & Essays.

Unit -3
2-3 classic short stories, 2-3 great short stories by Indian writers. Preparation for Job: Writing Applications for Jobs, Preparing Curriculum Vitae, Preparing for Interviews, Preparing for Group Discussions.

Unit -4
Grammar:
Sentence Structure, Idiomatic Usage of Language, Tenses, Direct &Indirect Parts of Speech, Active & Passive Voice, Vocabulary.

Unit -5
Preparation for Job:
Writing Applications for Jobs, Preparing Curriculum Vitae, Preparing for Interviews, Preparing for Group Discussions.

Text Books:

1. Organizations - Structures, Processes and Outcomes; Richard h Hall; Prentice Hall India.

2. English for the Secretary; Yvonne Hoban; Tata McGraw Hill.

3. Technical Communication: M. Raman & S. Sharma; Oxford University Press.

4. Business Communication Process and Product: M.E. Guffey; Thomson Learning.

Reference Book:

1. Human Behavior at Work; John W Newstorm & Keith Davis; Tata McGraw Hill.

2. The Most Common Mistakes in English Usage; Thomas Elliot Berry, Tata McGraw Hill

3. Business Communication: R.K. Madhukar; Vikas Publication.

Engineering Graphics (DIP105)

COURSE OBJECTIVES:
1. To improve imagination skills.
2. Increase ability to communicate with people.
3. Learn to sketch and take field dimensions.
4. Learn to take data and transform it into graphic drawings.
5. Learn basic engineering drawing formats.
6. Prepare the student for future Engineering positions.

COURSE OUTCOMES:
At the end of course the student will be able to:
1. Get acquainted with the knowledge of various lines, geometrical constructions and construction of various kinds of scales, and Ellipse.
2. Improve their imagination skills by gaining knowledge about points, lines and planes.
3. Become proficient in drawing the projections of various solids.
4. Gain knowledge about orthographic and isometric projections.

Contents (Theory)

Unit -1
Drawing Instruments and their uses :
1.1   Letters and numbers (single stroke vertical)
1.2   Convention of lines and their applications.
1.3   Scale (reduced, enlarged & full size) plain scale and diagonal scale.
1.4   Sheet layout.
1.5   Introduction to CAD (Basic draw and modify Command).
1.6   Geometrical constructions.
Unit -2
Engineering
2.1 **curves & Loci of Point:To draw an ellipse by :**

2.1.1 Directrix and focus method

2.1.2 Arcs of circle method.

2.1.3 Concentric circles method.

2.2 **To draw a parabola by :**

2.2.1 Directrix and focus method

2.2.2 Rectangle method

2.3 **To draw a hyperbola by:**

2.3.1 Directrix and focus method

2.3.2 passing through given points with referenceto asymptotes.

2.3.3 Transverse Axis and focus method.

2.4 **To draw involutes of circle & polygon (up to hexagon)**

2.5 **To** draw a cycloid, 21 picycloids, hypocycloid Todraw Helix & spiral.

2.6 Loci of Points:

2.7 Loci of points with given conditions and examples

2.7.1 Related to simple mechanisms.

Unit – 3

Orthographic projections :

3.1   Introduction to Orthographic projections.

3.2   Conversion of pictorial view into Orthographic Views (First AngleProjection Method Only).

3.3   Dimensioning technique as per SP-46.

Unit – 4

Isometric projection:

4.1   Isometric scale.

4.2   Conversion of orthographic views into isometric View/projection(Simple objects)

4.3   Projection of Straight Lines and Planes. (First Angle Projection Method only).

Unit – 5

5.1   Lines inclined to one reference plane only and limited to both ends inone quadrant.

5.2   Projection of simple planes of circular, square, rectangular, rhombus, pentagonal, and hexagonal, inclined to one reference plane and perpendicular to the other.

Text Books:-

	Titles of the Book	Name of Authors.	Name of the Publisher
(i)	Engineering Drawing	N.D. Bhatta	Charotar Publishing House
(ii)	Engineering Drawing & Graphics +Auto CAD	K. Venugopal	New Age Publication
(iii)	Engineering Drawing	R.K. Dhawan	S. Chand Co.
(iv)	Engineering Drawing	P.J. Shah	-
(v)	Engineering Graphics	K.R. Mohan	Dhanpat Rai and Publication Co.
(vi)	Engineering Graphics	Dharmendra Kumar	Foundation Publishing House

Computer Fundamentals (DIP106)

Objectives:
- To understand basics of computer and working with OS
- To develop working skills with productivity tools, graphics designing and Internet.
- To acquire basic programming skills.
- To apply computing in problem solving.

Course Outcomes
- After successfully completing this course, a student will be able to:
- Converse in basic computer terminology
- Formulate opinions about the impact of computers on society
- Possess the knowledge of basic hardware peripherals
- Know and use different number systems and the basics of programming

Contents: Theory

Unit -1

Evolution of computer, Data and Information, Characteristics of computers, Various fields of application of computers, various fields of computer (Hardware, Software, Human ware and Firmware), Advantages and Limitations of computer,

Block diagram of computer, Function of different units of computer, Classification of computers Types of software (System and Application), Compiler and Interpreter, Generation of language (Machine Level, Assembly, High Level, 4GL).

Unit -2
Input and Output Devices, **Computer Memory:** & **Number System (Logic gates)**

Primary Memory (ROM and it's type – PROM, EPROM, EEPROM, RAM) Secondary memory- SASD, DASD Concept, Magnetic Disks – Floppy disks, Hard disks, Magnetic Tape, Optical disks – CD ROM and it's type (CD ROM, CD ROM-R, DVD, Flash Memory.

Introduction to Number System, Conversion of Number System, Signed and Unsigned Numbers, Binary Coding, Logic gates, Boolean algebra, Combination of Logic Gates.

Unit -3

Operating System Concept:

Introduction to operating system; Function of OS, Types of operating systems, Booting Procedure, Start-up sequence, Dos – History, Files and Directories, Internal and External Commands, Batch Files

Unit -4

Editors and Word Processors 5

Basic Concepts: MS-Word, Introduction to desktop publishing **Spreadsheetsand Database packages:**
Purpose, usage, commands - MS-Excel Creation of files in MS-Access, MS – PowerPoint

Unit -5

Concept of Data Communication and Networking: Networking Concepts, Types of networking (LAN, MAN AND WAN), Communication Media, Mode of Transmission (Simplex, Half Duplex, Full Duplex), Analog and Digital Transmission. Synchronousand Asynchronous Transmission, Different Topologies

Text Books:
1. Leon and Leon; Introduction to Information Technology, Leon Tech World.
2. Microsoft Office-2000 Complete- BPB Publication.
3. Sinha, Kr. Pradeep and Preeti Sinha; Foundations of Computing, BPB Publication.
4. Jain, V.K.; Computers and Beginners

SEMESTER - 2

THEORY		PERIOD			Evaluation Scheme			Credit
CODE	NAME OF THE PAPER	LECTURES	TUTORIALS	PRACTICALS	IA	ESE	SUB-TOTAL	
DIP201	Communication Skills-II	3	1	0	30	70	100	4
DIP202	Engg. Mathematics-I	3	1	0	30	70	100	4
DIP203	Applied Science	4	0	0	30	70	100	4
DIP204	Engg. Mechanics	4	0	0	30	70	100	4
DIP205	Engg. Drawing	3	0	1	30	70	100	4
DIP206	Introduction to Software Package	3	0	1	30	70	100	4
DIP207L	Basic Workshop Practice	0	0	2	15	35	50	2
DIP208L	CHEM LAB	0	0	2	15	35	50	2
							Total Credits:	28

Communication Skills-II (DIP201)

COURSE OBJECTIVES:
1. Ability to be comfortable with English in use while reading or listening.
2. Ability to use receptive skills through reading and listening to acquire good exposure to language and literature.
3. Ability to write and speak good English in all situations.
4. Students should develop style in speech and writing and manipulate the tools of language for effective communication.
5. The course should provide exposure to the learners in Good Prose texts and Poems and expose the learners to value based ideas.

COURSE OUTCOMES:
1. Students can read and understand any text in English listening to the inputs given by the teacher in the classroom.
2. Students imbibe the rules of language unconsciously and tune to deduce language structure and usage.
3. Students write paragraphs, essays, and letters.
4. Students decipher the mechanism of language and use it for success in competitive examinations and job related speaking and writing tasks.

Contents Theory

Unit -1
Introduction to communication:
1.1 Definition , CommunicationCycle/Process,
1.2 The elements of communication: sender-message- channel-Receiver -Feedback & Context.
1.3 Definition of Communication Process.
1.4 Stages in the process : defining the context, knowing the audience, designing the message, encoding , selecting proper channels, transmitting, receiving, decoding and giving feedback.

Unit -2
Types of communication:
2.1 Formal- Informal, Verbal- Nonverbal, Vertical- Horizontal- Diagonal.

Unit - 3
Principals of effective communication:
3.1 Definition of Effective Communication.
3.2 Communication Barriers & how to overcome them.
3.3 Developing effective messages: Thinking about purpose, knowing the audience, structuring the message, selecting proper channels, minimizing barriers & facilitating feedback.

Unit - 4
Nonverbal- graphic communication:
4.1 Noun- verbal codes: A- Kinesics , B- Proxemics , C - HapticsD-Vocalics , E- Physical appearance. F - Chronemics , G -Artifacts Aspects of Body Language Interpreting Visuals & illustrating with Visuals like Tables, Charts & graphs.

Unit - 5
Formal written skills:
5.1 Office Drafting: Circular, Notice, and Memo.
5.2 Job Application with resume.
5.3 Business correspondence: Enquiry, Order letter, Complaint letter, and Adjustment letter.
5.4 Report writing: Accident report, falling production, Progress / Investigative.
5.5 Defining & describing objects & giving Instructions.

	Tilles of the Book	Name of Authors.	Name of the Publisher
(i)	Developing Communication Skills	Krushna Mohan, Meera Banerji	Macmillan
(ii)	Communication Skills	Joyeeta Bhattacharya.	Reliable Series
(iii)	Every ones guide to effective writing	Jayakaran	Apple Publishing
(iv)	Communication Skills-II	Kajari Guha	Foundation Publishing House
(v)	Effectual Communication Skills	Bhupender Kour	S.K. Kataria & Sons.
(vi)	The Functional Aspects of Communication Skills	Dr. P. Prasad	S.K. Kataria & Sons.
(vii)	Communication Skills	Leena Sen	Prentice Hall of India Pvt.Ltd.
(viii)	Professional Communication	Dr. Raavee Tripathi	S.K. Kataria & Sons.
(ix)	Technical Communication for Engineers	Shalini Verma	Vikas Publishing Home Pvt. Ltd.

Engineering Mathematics-I (DIP202)

Course Objectives:
• To recall and remember basics of matrices, complex numbers, and differential calculus.
• To understand the concepts of basic mathematical methods for matrices, complex numbers and differential calculus.
• To apply methods to solve engineering problems.
• To analyze engineering problems and evaluate.
• To solve and evaluate the problems using matrices, complex numbers, and differential calculus. Course

Outcomes:
• Students will be able to remember terminologies and formulae in matrices, complex numbers, and differential calculus.
• Students will be able to understand and interpret the concepts of matrices, complex numbers, and differential calculus.
• Students will be able to compare and analyze the methods in matrices, complex numbers, and differential calculus.
• Students will be able to predict and evaluate the problems in matrices, complex numbers, and differential calculus.

Contents theory

Unit -1
Function and Limit:
1.1   Function
1.1.1   Definitions of variable, constant, intervals such as open, closed, semi-open etc.
1.1.2   Definition of Function, value of a function and types of functions, Simple Examples.
1.2   Limits
1.2.1   Definition of neighborhood, concept and definition limit.
1.2.2   Limits of algebraic, trigonometric, exponential and logarithmicfunctions with simple examples.

Unit -2
Derivatives:
2.1   Definition of Derivatives,notations.
2.2   Derivatives of Standard Functions
2.3   Rules of Differentiation.(Without proof).Such as Derivatives of Sum or difference, scalar multiplication, Product and quotient.
2.4   Derivatives of composite function (Chain rule)
2.5   Derivatives of inverse and inverse trigonometric functions.
2.6   Derivatives of Implicit Function
2.7   Logarithmic differentiation
2.8   Derivatives of parametric Functions.
2.9   Derivatives of one function w.r.t another function
2.10   Second order Differentiation.

Unit - 3
Statistics And Probability:
3.1   Statistics
3.1.1   Measures of Central tendency (mean, median, mode) for ungrouped and grouped frequency distribution.
3.1.2   Graphical representation (Histogram and Ogive Curves) to findmode and median.
3.1.3   Measures of Dispersion such as range, mean deviation,Standard Deviation, Variance and coefficient of variation.

Comparison of two sets of observations.

3.2 Probability

3.2.1 Definition of random experiment, sample space, event, Occurrence of event and types of events (impossible, mutuallyexclusive, exhaustive, equally likely).

3.2.2 Definition of Probability, addition and multiplication theorems ofProbability

Unit - 4

4.1 Applications OfDerivative

4.1.1 Geometrical meaning of Derivative, Equation of tangent andNormal.

4.1.2 Rates and Motion

4.1.3 Maxima and minima

4.1.4 Radius of Curvature

4.2 Complex number

4.2.1 Definition of Complex number. Cartesian, polar, Exponentialforms of Complex number.

4.2.2 Algebra of Complex number(Equality, addition, Subtraction,Multiplication and Division)

4.2.3 De-Moivre's theorem(without proof) and simple problems.Euler's form of Circular functions, hyperbolic functions and relations between circular &hyperbolic functions

Text Books :-

	Tilles of the Book	Name of Authors.	Name of the Publisher
(i)	Mathematics for Polytechnic	S.P. Deshpande	Pune Vidyarthi Griha Prakashan Pune.
(ii)	Calculus single Variable	Robert T Smith	Tata McGraw Hill
(iii)	Advanced Engineering Mathematics	Dass H.K.	S. Chand Publication, New Delhi
(iv)	Fundamentals of Mathematical Statistics	S.C. Gupta and Kapoor	S. Chand Publication New Delhi
(v)	Higher Engineering Mathematics	B.S. Grewal	Khanna Publication, New Delhi
(vi)	Applied Mathematics	P.N. Wartikar	Pune Vidyarthi Griha Prakashan, Pune.
(vii)	Engineering Mathematics	Sindhu Prasad	Foundation Publishing House

Applied Science (DIP203)

Programme Specific outcomes

1) After completion of program, students have deep knowledge of basic concepts in Physics.

2) Students are expected to acquire core knowledge in Physics, including the major premises of Mechanics and Properties of matter, Modern Physics, Classical and Quantum mechanics, Electricity and Magnetism, Digital Electronics, Optics, Relativity, Heat and Thermodynamic, Solid State Physics, Mathematical and Statistical physics, Atomic, Molecular and Nuclear Physics, Laser and nonconventional energy sources.

3) Students are also expected to develop written and oral communication skills in communicating physics-related topics.

4) Students should learn how to design and conduct an experiment and understand the basic physics behind it.

5) Students will develop the proficiency in the handling of laboratory instruments.

Course Outcomes

1) The syllabi are framed in such a way that it bridges the gap between the plus two and 11th levels of Physics by providing a more complete and logical framework in almost all areas of basic Physics.

2) By the end of the first year (2nd semester), the students should have attained a common level in basic mechanics, Optics, Heat and Thermodynamics and Electricity and Magnetism. They were developed their experimental and data analysis skills through experiments at laboratories.

3) Students should have been introduced to powerful tools for tackling a wide range of topics in, Modern Physics, General Electronics, Mathematical and Statistical Physics and Solid State Physics They develop their experimental and data analysis skills through a wide range of experiments through practical at laboratories.

(A) PHYSICS

Unit-1
1. Kinematics
Rectilinear Motion
Equations of Motions- $v = u+at$, $S = ut+1/2at^2$, $V^2 = u^2+2as$ (only equation), Distance traveled by particle in n^{th} second, Velocity TimeDiagrams-uniform velocity, uniform acceleration and uniform retardation, equations of motion for motion under gravity.
Angular Motion
Definition of angular displacement, angular velocity, angular acceleration, Relation between angular velocity and linear velocity, Three equations of circular motion (no derivation) angular distance traveled by particle in n^{th} second (only equation), Definition of S.H.M. and S.H.M. as projection of uniform circular motion on any one diameter, Equation of S.H.M. and Graphical representation of displacement ,velocity, acceleration of particle in S.H.M. for S.H.M. starting from mean position and from extreme position.

Unit-2

2. Kinetics
Definitions of momentum, impulse, impulsiveforce,Statements of Newton's laws of motion and with equations, Applications of laws of motion—Recoil of gun, Motion of two connected

bodies by light inextensible string passing over smooth pulley, Motion of lift.

Work, Power, Energy

Definition of work, power and energy, equations for P.E. K.E., Work energy principle, Representation of work by using graph, Work doneby a torque(no derivation).

Unit -3

Non -destructive testing of Materials.

Testing methods of materials -Destructive and Nondestructive, Advantages and Limitations of N.D.T., Names of N.D.T. Methods used in industries, Factors on Which selection of N.D.T. dependents, Study of Principle, Set up, Procedure.

Working, Advantages, limitations, Applications and Application code of following N.D.T. methods - Penetrant method, Magnetic particlemethod, Radiography, Ultrasonic, Thermography.

Unit -4

Acoustics and Indoor Lighting of Buildings

Acoustics

Weber and Fetcher's law, limit of intensity and loudness, echo, Reverberation and reverberation time (Sabine's formula) ,Timbre (quality of sound), Pitch or Frequency of sound. Factors affecting Acoustical planning of auditorium-- echo, reverberation, creep, focusing,standing wave, coefficient of absorption, sound insulation, noise pollution and the different ways of controlling these factors.

Indoor lighting

Definition of luminous intensity, intensity of illumination with their SIunits, Inverse square law and Photometric equation, Bunsen's photometer— ray diagram, working and applications, Need of indoor lighting, Indoor lighting schemes and Factors Affecting Indoor Lighting.

Text/Reference Books :-

	Tilles of the Book	Name of Authors.	Name of the Publisher
(i)	Physics –I	V. Rajendran	Tata McGraw - Hill
(ii)	Applied Physics	Arthur Beiser	Tata McGraw - Hill
(iii)	Engineering Physics	R.K. Gaurand and S.L. Gupta	Dhanpatrai
(iv)	Phyiscs	Resrie and Holliday	-
(v)	Concept of Physics Part-I, II	H.C. Verma	-
(vi)	Applied science	Roshan Kr. Sinha	Foundation Publishing House

(B) CHEMISTRY

Programme Specific Outcome

- Inorganic Chemistry

- Methodology and Perspectives of Sciences and General Informatics

- Organic Chemistry

- Physical Chemistry

- Practical papers– Inorganic, Volumetric, Organic, Physical and Gravimetric experiments

Programme outcome:

Chemistry introduces basic concepts, experimental techniques and applications of chemical sciences and introduces cheminformatics, Green chemistry and micro analytical techniques.

Unit -1

Electrochemistry

Definition of Electrolyte & Conductor, Difference between Metallic &Electrolytic Conduction, Ionisation, Degree of Ionisation & FactorsAffecting Degree of Ionisation, Conductivity of Electrolytes.

Definition of Electrochemical Cell, Battery, Charge, Discharge, Closed Circuit Voltage, Open Circuit Voltage, EMF, Internal Resistance, Separator, Classification of Batteries such as Primary, Secondary &Reserve with Examples.

Industrial Application of Electrolysis - Metallic or Protective Factorsfor Selection of Method of Coating, Process of Electroplating, Electrorefining, Electrometallurgy (Applications of Electroplating),Impregnated Coating or Cementation on Base Metal Steel - Coating
Metal Zn (Sheradizing),Cr (Chomozing), Al (Colorizing), Applications,Advantages & Disadvantages.

Unit -2

Non Metallic Engineering Materials

(Plastic, Rubber, Insulators, Refractories, Composite Material, Ceramics)

1. **Engineering Plastic:**
   Special Characteristics & Engineering Applications of Polyamides orNylons, Polycarbonates (Like Lexan, Merlan), Polyurethanes (Like Perlon - U), Silicons, Polyacetals, Teflon, Laminated Plastic, Thermocole, Reinforced Plastic.

2. **Ceramics:**
   Definition, Properties & Engineering Applications, Types - Structural Ceramics, Facing Material, Refractories, Fine Ceramics, Special Ceramics.

3. **Refractories:**
   Definition, Properties, Applications & Uses of Fire Clay, Bricks, Silica Bricks.

4. **Composite Materials:**
   Definition, Properties, Advantages, Applications & Examples.

Unit -3

Metals & lloys

Metals - Metallurgy of Iron, Terms Involved in Metallurgy, IndianResources of Fe, Imp Ores, Extraction, Smelting in Blast
Furnace, Chemical Reactions in Blast Furnace, Products of Blast Furnace, their Composition, Application, Commercial Forms of Iron, (Pig Iron / Cast Iron, Wrought or Malleable Steel), their Composition, Properties &Applications, Types of Casting (Chilled Casting, Centrifugal Casting & Malleable Casting), Heat Treatment, Heat Treatment of Cast Iron &Steel.

Alloys - Definition, Types, Ferrous Alloys - Steel, Composition, Properties & Applications of Plain Carbon Steel (Low Carbon, MediumCarbon, High Carbon & Very Hard Steel) & Alloy Steels, (Heat Resisting, Shock Resisting, Magnetic, Stainless, Tool Steel & HSS), Effect of Various AlloyingElements (Cr, W, V, Ni, Mn, Mo, Si) etc. on Steel.

Non-Ferrous Alloys - Copper Alloy - Brass, Bronze, Nickel Silver or German Silver, their Composition, Properties & Applications, Aluminium Alloy - Duralumin, Bearing Alloy - Babbitt Metal, Solders -Soft Solder,Brazing Alloy, Tinamann's Solder, Nickel Alloy - Monel Metal, Low Melting Alloys - Woods Metal.

Unit -4

Corrosion

Definition, Types, Atmospheric or Chemical Corrosion, Mechanism, Factors Affecting Atmospheric, Corrosion & Immersed Corrosion or Electrochemical Corrosion, Mechanism, Protection of Metals by

Purification of Metals, Alloy Formation, Cathode Protection, Controllingthe External Conditions & Application of Protective Coatings i.e.
Galvanising, Tinning, Metal Spraying, Sherardizing, Electroplating, MetalClodding, Cementation or Diffusion Method, their Definition, Procedure, Uses, Advantages & Disadvantages, Examples of Non Corrosive Materials, Protection of Corrosion by the Use of Organic Coating Like Paint, Lacquer, Enamels, Emulsion Paints, Special Paints, their Properties & Uses.

Special Paints - Heat Resistant, Cellulose Paint, Coaltar Paint, Antifouling Paint their constituents & applications.

Unit -5
Lubricant
Lubricant, Types, Lubrication Mechanism by Fluid Film, Baundary, Extreme Pressure, Physical Characteristics of Lubricants Such as Viscosity, Viscosity Index, Oilness, Volatility, Flash & Fire Point, Cloud & Pour Point, Chemical Characteristics such as Acid Value or Neutralization Number, Emulsification, Saponification Value, Selectionof Lubricants
for Various Types of Machineries.

Text Books :-

	Tilles of the Book	Name of Authors.	Name of the Publisher
(i)	Engineering Chemistry	Jain & Jain	Dhanpat Rai and Sons
(ii)	Engineering Chemistry	S.S. Dara	S. Chand Publication
(iii)	Industrial Chemistry	B.K. Sharma	Goel Publication
(iv)	Environmental Chemistry & Pollution Control	S.S. Dara	S. Chand Publication
(v)	Applied science	Sanjay Kumar, Rahul Kumar	Foundation Publishing House

Engineering Mechanics (DIP204)

Course Objectives:

1. Understand the scalar representation of forces and moments.
2. Describe static equilibrium of particles and rigid bodies in two dimensions including the effect of friction.
3. Analyse the properties of surfaces and solids in relation to moment of inertia.
4. Illustrate the laws of motion, kinematics of motion and their relationship.
5. Study the mechanical vibration without and with damping of SODF and MDOF.

Course Outcomes:

After successful completion of this course, the students should be able to:

CO1: Construct free body diagram and calculate the reactions necessary to ensure static equilibrium.

CO2: Study the effect of friction in static and dynamic conditions.

CO3: Understand the different properties of surfaces in relation to moment of inertia.

CO4: Analyse and solve different problems of kinematics and kinetics.

Contents Theory

Unit -1
Force

a. **Fundamentals: -** Definitions of mechanics, statics, dynamics. Engineering Mechanics, body, rigid body, mass, weight, length, time, scalar and vector, fundamental units, derived units, S.I. units.

b. **Force**: - Definition of a force, unit force, Newton, S.I. unit of a force, representation of a force by vector and by Bow's notation method. Characteristics of a force, effects of a force, principle of transmissibility.

c. **Resolution of a force:** Definition, Method of resolution, Types of component forces, Perpendicular components and Non- perpendicular components.

d. **Moment of a force: -** Definition, measurement of moment of a force, S. I. unit, geometrical meaning of moment of a force, classification of moments according to direction of rotation, sign convention, law of moments Varignon's theorem of moment and it's use, couple - definition, S.I. unit, measurement of a couple, properties of couple.

e. **Force system: -** Definition, classification of force system according to plane and line of action

f. **Composition of Forces**: - Definition, Resultant force, methods of composition of forces,

   I - Analytical method:- (i) Trigonometric method (law of parallelogram of forces) (ii) Algebraic method (method of resolution),

   II - Graphical method: - Introduction, space diagram, vector diagram, polar diagram, and funicular polygon. Resultant of concurrent, non-concurrent and parallel force system by analytical and graphical method.

Unit -2
Equilibrium:

2.1 Definition, conditions of equilibrium, analytical and graphical conditions of equilibrium for

concurrent, non-concurrent and parallel force system, free body and free body diagram.

2.2 Lami's Theorem - statement and explanation, Application of Lami's theorem for solving various engineering problems.

2.3 Equilibrant - Definition, relation between resultant and equilibrant, equilibrant of concurrent and non-concurrent force system.

2.4 Beams - Definition, Types of beams (cantilever, simply supported, overhanging, fixed, continuous), Types of end supports (simple support, hinged, roller), classification of loads, point load, uniformly distributed load. Reactions of a simply supported and over hanging beam by analytical and graphical method.

Unit - 3
Friction:

3.1 Definition of friction, force of friction, limiting frictional force, coefficient of friction, angle of friction, angle of repose, relation between angle of friction angle of repose and coeff. Of friction. Cone of friction, types of friction, laws of friction, advantages and disadvantages of friction.

3.2 Equilibrium of bodies on level plane - external force applied horizontal and inclined up and down.

3.3 Equilibrium of bodies on inclined plane - external forces is applied parallel to the plane, horizontal and incline to inclined plane.

3.4 Ladder friction, Wedge and block.

Unit - 4
Centroid and Centre Of Gravity:

4.1 **Centroid:** Definition of centroid. Moment of an area about an axis. Centroid of basic geometrical figures such as square, rectangle, triangle, circle, semicircle and quarter circle. Centroid of composite figure.

4.2 **Center of gravity:** Definition, center of gravity. Of simple solids such as cylinder, sphere, hemisphere, cone, cube, and rectangular block. Centre of gravity of composite solids.

Unit - 5
Simple Machines:

5.1 Definitions of simple machine, compound machine , load , effort , mechanical advantage , velocity ratio , input on a machine ,output of a machine ,efficiency of a machine , expression for mechanical advantage , velocity ratio and efficiency of a machine. Ideal machine, ideal effort and ideal load, friction in machines, effort lost in friction and frictional load.

5.2 Law of machine, maximum mechanical advantage and maximum efficiency of a machine, reversibility of a machine, condition for reversibility of a machine, self-locking machine.

Text Books :-

	Tilles of the Book	Name of Authors.	Name of the Publisher
(i)	Engineering Mechanics	Beer-Johnson	Tata McGraw Hill, Delhi
(ii)	Engineering Mechanics	Basu	Tata McGraw Hill, Delhi
(iii)	Vector Mechanics for Engineers Vol. - I & II	Joslph F. Shelley	Tata McGraw Hill, Delhi
(iv)	Engg. Mechanics	Ram Manohar Pandey	Foundation Publishing House

Engineering Drawing (DIP205)

Course Objectives

To understand techniques of drawings in various fields of engineering

Course Outcomes (COs)

CO1: To know about different types of lines & use of different types of pencils in an engg. Drawing
CO2: To know how to represents letters & numbers in drawing sheet
CO3: To know about different types of projection
CO4: To know projection of points, straight lines, solids etc.
CO5: To know development of different types of surfaces.
CO6: To know about isometric projection.

Contents (Theory)

Unit -1
Projections of Solids
Projections of Prism, Pyramid, Cone, Cylinder, Tetrahedron, Cube with their axes inclined to one reference plane and parallel to other, Resting on their base on HP.(Draw in sheet and software).

Unit - 2
Isometric Projection
Conversion of Orthographic Views into Isometric view/projection (Including rectangular, cylindrical objects, representation of slots on sloping as well as plane surfaces). (Draw in sheet and software).

Unit - 3
Developments of Surfaces
Developments of Lateral surfaces of cube, prisms, cylinder, pyramids, cone and their applications such as tray, funnel, Chimney, pipe, bends etc.

Unit – 4
Threads: Thread terminology, Types of thread (Acme, Buttress, Square, Sellers, Whitworth, Knuckle, Metric, Unified)

Unit - 5
Free Hand Sketches
Freehand sketches of nuts, bolts, rivets, split pin, foundation bolts.

Text Books :-

	Tilles of the Book	Name of Authors.	Name of the Publisher
(i)	Engineering Drawing	N.D. Bhatta	Charotkar Publishing House
(ii)	Engineering Drawing	R.K. Dhawan	S. Chand Co.
(iii)	Engineering Drawing	P.J. Shah	-
(iv)	Machine Drawing	N.D. Bhatta	Charotkar Publishing House
(v)	Engineering Drawing and Graphics + Auto CAD	K. Venugopal	New Age Publication
(vi)	Engineering Graphics	K.R. Mohan	Dhanpat Rai and Publication Co.
(vii)	Machine Drawing	R.K. Dhawan	S. Chand Co.
(viii)	Engineering Drawing	Dharmendra Kumar	Foundation Publishing House

Introduction to Software Package (DIP206)

COURSE OUTCOMES (CO)

COURSE 1.1- Microsoft Word

CO1. Performing basic editing functions, formatting text, copy and moving objects and text.

CO2. Leaning the formatting skills on paragraphs, tables, lists, and pages.

CO3. Knowledge on navigating the Word Ribbon Interface.

CO4. Understanding the process of inserting graphics, pictures, and table of contents, Drop Cap.

CO5. Learning the utilities of Auto text, AutoCorrect, Footnotes and Bookmark

COURSE 1.2- Microsoft Excel

CO1. Demonstrating the basic mechanics and navigation of an Excel spreadsheet.

CO2. Formatting techniques and presentation styles.

CO3. Learning the use and utility of functions and formulas on excel spreadsheet.

CO4. Working knowledge of organizing and displaying large amounts and complex data.

CO5. Using clip art to enhance ideas and information in Excel worksheets.

COURSE 1.3- Microsoft PowerPoint

CO1. Learning to modify presentation themes.
CO2. Analyzing formatting techniques and presentation styles
CO3. Integrating information from other Microsoft programs into a PowerPoint presentation.
CO4. Working with text, themes, and styles.
CO5. Creating charts, grants, and tables.
CO6. Inserting media clips and animation

Contents: Theory

Unit -1

WORD PROCESSING PACKAGE (MS-WORD):

01.01 Features of Word Processing Package MS-Word, Menu Options-File, Edit, View, Insert, Format, Tools-spelling and grammar, language, mail- merge, options; table.

01.02 Creating, editing and saving a document, Opening a document,password protection for file.

01.03 Setting page margins, tab setting, ruler and indenting.

01.04 Formatting a document- using different fonts; changing font size and colour; changing the appearance through bold/italic/underline; highlighting text; change case; use of sub script and superscript.

01.05 Alignment of text in a document and justification, use of bullets and numbering.

01.06 Paragraph formatting, inserting page breaks and column breaks.

01.07 Use of headers, footers, footnote and end note. Use of Comments, inserting date, time, and special symbols, importing graphical images and use of drawing tools

01.08 Creating table, formatting cells, using different border styles, shading in tables, merging of cells, and partition of cells, inserting and deletinga row/column in a table.

01.09   Print preview, zoom, page setup, print options.

01.10 Use of tools such as spell checker, help, mail-merge, and use of macros.

Unit -2

SPREADSHEET PACKAGE (MS-EXCEL):

02.01 Features of Spreadsheet package such as MS Excel, Menu Options- File; edit; view; insert; format; tools- spelling, auto correct, protection, options; data.

02.02 Concepts of cell and cell-addressing.

02.03 Creating, operating and saving worksheet.

02.04 Entering text, numeric information and formula

02.05 Formatting numbers and text, protection cells, printing worksheet.

02.06 Using data management functions-mathematical, statistical andfinancial functions.

02.07 Creating different types of charts, graphs and balance worksheet anddisplaying 3-D Charts, printing and resizing charts.
Importing files and graphics.

Unit -3

PRESENTATION PACKAGE (MS-POWER POINT):

03.01 Features of Presentation Package MS-Power Point, Menu options- File; edit, view; insert; format; tools-spelling, language, auto clipart, slide show

03.02 Status bar, tool bar, customized tool bar, slide view, outline view, slide sorter view, notes page view, slide show view

03.03 Creating and saving slides, opening and editing slides, changing layout of a slide, deleting of slide, changing layouts of a slide, deleting of slide,changing the order of slides, animation.

03.04 Working with objects: selecting, grouping, ungrouping and regrouping of objects, moving, aligning, cutting, copying, pasting, and duplicating objects.

03.05 Putting text on slides: selecting and editing text, finding and replacingtext.

03.06 Creating graphs and importing files.

03.07 Creating tables.

03.08 Use of data sheet view and design view.

Unit -4

ANTI VIRUS PACKAGES:

05.01 Introduction to Virus.

05.02 Virus Protection, Deletion & Removal Utilities Anti-Virus Packages to prevent, detect & delete Viruses.

Books Recommended:-

1.	MS office 2000 for Everyone, Vikash Publications, New Delhi	-	Sanjay Saxena
2.	MS office 2000, Addison Wesley(Singapore) Pvt. Ltd., New Delhi	-	Sagman
3.	MS office 2000 8-in-1, Prentice Hall of India, New Delhi	-	Habraken
4.	MS office, BPB Publications, New Delhi	-	Ron Mansfield
5.	MS Word 2000 in a Nutshell, Vikash Publishing House, New Delhi.	-	Sanjay Saxena
6.	MS Excel 2000 in a Nutshell, Vikash Publishing House, New Delhi.	-	Sanjay Saxena

SEMESTER - 3

THEORY		PERIOD			Evaluation Scheme			Credit
CODE	NAME OF THE PAPER	LECTURES	TUTORIALS	PRACTICALS	IA	ESE	SUB-TOTAL	
DIP301	Engg. Mathematics-II	4	0	0	30	70	100	4
DIP3CS02	Computer Programming Through 'C'	4	0	0	30	70	100	4
DIP3CS03	Introduction to Software Engineering	4	0	0	30	70	100	4
DIP3CS04	Digital Electronics	4	0	0	30	70	100	4
DIP3CS05	Operating System	4	0	0	30	70	100	4
DIP3CS06L	C LAB	0	0	2	15	35	50	2
DIP3CS07L	OS LAB	0	0	2	15	35	50	2
							Total credit:	24

Engineering Mathematics-II (DIP301)

Course Outcomes

CO1: To understand the formation of Differential equation from the given physical problems and to solve first orders ordinary differential equation by various methods.

CO2: To be able to apply the knowledge of first order ordinary differential equation in different engineering applications.

CO3: To find the Fourier series representation of a function of one variable and to find half-range Fourier series for even/odd functions.

CO4: To know the fundamental theorem of calculus and be able to use it for evaluating definite integrals and derivatives of integrals with variable limits of integration. To be able to do curve tracing of functions starting from algebraic formulae in the form of a parameterized curve.

CO5: To solve applied problems by using principles of Sphere, cone and cylinders.

UNIT-01
Integration:
1.1 Definition of integration as anti-derivative. Integration of standard function.
1.2 Rules of integration (Integrals of sum, difference, scalar multiplication).
1.3   Methods of Integration.
1.3.1 Integration by substitution
1.3.2   Integration of rational functions.
1.3.3   Integration by partial fractions.
1.3.4   Integration by trigonometric transformation.
1.3.5   Integration by parts.
1.4   Definite Integration.
1.4.1   Definition of definite integral.
1.4.2   Properties of definite integral with simple problems.

1.5   Applications of definite integrals.
   1.5.1 Area under the curve. Area bounded by two curves,1.5.2Volume of revolution.
   1.5.3 Centre of gravity of a rod, plane lamina.

1.5.4 Moment of Inertia of uniform rod, rectangular lamina1.5.5Theorems of parallel and perpendicular axes.

UNIT-02

Differential Equation

2.1 Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containingsingle constant.

2.2 Solution of differential equations of first order and first degree such asvariable separable type, reducible to Variable separable, Homogeneous, Nonhomogeneous, Exact, Linear andBernoulli equations.

2.3 Applications of Differential equations.

2.3.1 Rectilinear motion (motion under constant and variableacceleration)

2.3.2 Simple Harmonic Motion.

UNIT-03

Probability Distribution

3.1 Binomial distribution.

3.2 Poisson's distribution.

3.3 Normal distribution

3.4Simple examples corresponding to production process.

UNIT-04

Numerical Methods

4.1 Solution of algebraic equations Bisection method, Regulafalsi method and Newton – Raphson method.

4.2 Solution of simultaneous equations containing 2 and 3 unknowns Gauss elimination method. Iterative methods- Gauss Seidal and Jacobi'smethods.

Text Books:		
Name of Authors	Titles of the Book	Name of the Publisher
Mathematics for polytechnic	S. P. Deshpande	PuneVidyarthiGriha Prakashan, Pune
Calculus: single variable	Robert T. Smith	Tata McGraw Hill
Laplace Transform	Lipschutz	Schaum outline series.
Fourier series and boundary value problems	Brown	Tata McGraw Hill
Higher Engineering Mathematics	B. S. Grewal	Khanna Publication, New Dehli
Introductory Methods of Numerical analysis	S. S. Sastry	Prentice Hall Of India, New Dehli
Numerical methods for scientific & engineering computations	M. K. Jain & others	Wiley Eastern Publication.

Computer Programming through 'C' (DIP3CS02)

Course Objectives

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To develop an in-depth understanding of functional and logical concepts of C Programming.
3. To provide exposure to problem-solving through C programming.
4. To familiarize the basic syntax and semantics of C Language

Course Outcomes (CO)

CO1 Recollect various programming constructs and to develop C programs.

CO2 Understand the fundamentals of C programming.

CO3 Choose the right data representation formats based on the requirements of the problem.

CO4 Implement different Operations on arrays, functions, pointers, structures, unions and files.

Contents: Theory

Unit -1
INTRODUCTION TO PROGRAMMING

The Basic Model of Computation, Algorithms, Flow-charts, Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation. Programming Style-Names, Documentation & Format, Refinement & Modularity.

Unit -2
ALGORITHM FOR PROBLEM SOLVING

Exchanging values of two variables, summation of a set of numbers. Reversing digits of an integer, GCD (Greatest Common Division) of two numbers. Test whether a number is prime. Organize numbers in ascending order. Find square root of a number, factorial computation, Fibonacci sequence. Compute sine Series. Check whether a given number is Palindrome or not. Find Square root of a quadratic equation multiplication of two matrices,

Unit -3
INTRODUCTION TO 'C' LANGUAGE

03.01
Character set, Variable and Identifiers, Built-in Data Types, Variable Definition, Declaration, C Key Words-Rules & Guidelines for Naming Variables.

03.02
Arithmetic operators and Expressions, Constants and Literals, Precedence & Order of Evaluation.

03.03
Simple assignment statement. Basic input/output statement.

03.04
Simple 'C' programs of the given algorithms

Unit -4
CONDITIONAL STATEMENTS AND LOOPS

04.01
Decision making within a program

04.02
Conditions, Relational Operators, Logical Operator.

04.03
If statement, if-else statement.

04.04
Loop statements

04.05
Break, Continue, Switch

Unit -5
ARRAYS

What is an Array?, Declaring an Array, Initializing an Array.

One dimensional arrays: Array manipulation: Searching, Insertion, Deletion of an element from an array; Finding the largest/smallest element in array; Two dimensional arrays, Addition/Multiplication of two matrices.

Unit -6
FUNCTIONS

Top-down approach of problem solving. Modular programming and functions,Definition of Functions Recursion, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Passing arguments to a Function: call by reference; call by value.

Unit -7
STRUCTURES AND UNIONS

Basic of Structures, Structures variables, initialization, structure assignment,Structures and arrays: arrays of structures,

Unit -8
POINTERS

Concept of Pointers, Address operators, pointer type declaration, pointerassignment, pointer initialization pointer arithmetic.

Text / Reference Books:

1. Programming with C. Second Edition. Tata McGraw-Hill, 2000 - Byron Gottfried

2. How to solve by Computer, Seventh Edition, 2001, Prentice hall of India.- R.G. Dromey

3. Programming with ANSI-C, First Edition, 1996, Tata McGraw hill.- E. Balaguruswami

4. Programming with ANSI & Turbo C. First Edition, Pearson Education.- A. Kamthane

5. Pointers in C, BPB publication, New Delhi.- Yashwant Kanetkar

Introduction to Software Engineering (DIP3CS03)

Course outcome:

CO1: Enables students to embrace problem solving and learning as a natural aspect of their work.

CO2: Enhances value and is valued by their professional teammates.

CO3: Gain to have broad and deep knowledge of the technical issues that they face.

CO4: Basic knowledge and understanding of the analysis and design of complex systems.

CO5: To develop methods and procedures for software development that can scale up for large systems and that can be used consistently to produce high-quality software at low cost and with a small cycle of time.

Contents: Theory

Unit -1

Introduction to Software Engineering: Characteristics, Emergence of Software Engineering, Software Metrics &Models, Process & Product Metrics.

Unit -2

Software Life Cycle Models: Waterfall, Prototype and SpiralModels and their Comparison.

Unit -3

Software Project Management: Size Estimation- LOC and FPMetrics, Cost Estimation-Delphi and Basic COCOMO.

Unit -4

Software Requirements Specification: SRS Documents, theirCharacteristics and Organization.

Unit -5

Software Design: Classification, Software Design Approaches, Function Oriented Software Design,

Structured Analysis- Data flow Diagrams and Structured Design, Introduction to Object Oriented Design.

Unit -6
Coding and Testing of Software: Unit Testing, Block Box Testing, White Box Testing, Debugging, Program Analysis Tools, System Testing.
Software Quality Assurance: ISO 9000 and SEI CMM andtheir Comparison.

Unit -7
Software Maintenance: Maintenance Process Models andReverse Engineering, Estimation of Maintenance Costs.
Software Development Tools: Introduction to "RationalRose".

Text Book:
1. Rajib Mall -Fundamentals of Software Engineering, Prentice Hall of India, New Delhi,2005

Reference Book:
1. PankajJalote- An Integrated Approach to Software Engineering, 3rd Edition, NarosaPublishing House, New Delhi,2005
2. Richard Fairley- Software Engineering Concepts, Tata McGraw Hill, New Delhi, 2006.

Digital Electronics (DIP3CS04)

Course Objectives
The objectives are to study
1. To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
2. To prepare students to perform the analysis and design of various digital electronic circuits.

Course Outcomes
After studying this course the students would gain enough knowledge
1. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
2. To understand and examine the structure of various number systems and its application in digital design.
3. The ability to understand, analyze and design various combinational and sequential circuits.
4. Ability to identify basic requirements for a design application and propose a cost effective solution.
5. The ability to identify and prevent various hazards and timing problems in a digital design

Contents: Theory

Unit -1
INTRODUCTION OF NUMBER SYSTEM:
Decimal, binary, octal and hexadecimal number systems, Conversionfrom one system to another, binary arithmetic, signed numbers Codes: BCD, Excess-3, Gray.

Unit -2
LOGIC FAMILIES AND CIRCUITS:
2.1 TTL, logic family
2.2 NAND gates
2.3 7400 and 5400 series of IC logic families: RTL, TTL, MOSand CMOS.

Unit -3

LOGIC GATES AND FLIP FLOPS:

3.1 Definitions, symbols and truth table of NOT, OR, AND, NAND,NOR, XOR, XNOR gates, De Morgan's theorems; Karnaugh-map.

3.2 Logical diagram, truth table; timing diagram and operation of following latches and flip flops: NOR latch, RS, T, D, JK, Master/Slave JK flip flops, encoders, decoders.

Unit -4

REGISTERS:

4.1 Shift Registers

4.2 Serial in Serial out

4.3 Serial in Parallel out

4.4 Parallel in Parallel out

4.5 Parallel in Serial out

Unit -5

COUNTERS:

5.1 Synchronous and Asynchronous counters

Decade counter and its application

Unit -6

ARITHMETIC CIRCUITS:

6.1 Half adder and full adder circuit, design and implementation, Half and full subtracted circuit, design and implementation

Unit -7

A/D AND D/CONVERTERS:

Analog to digital conversion

Unit -8

SEMICONDUCTOR MEMORIES:

8.1 Memory Unit

8.2 Concept of memories using registers

8.3 Read only Memory (ROM)

8.4 Random Access Memory (RAM)

8.5 Static and Dynamic Memory

Unit -9

MULTIPLEXERS AND DE-MULTIPLEXERS:

Basic functions and Block diagram of MUX and DEMUX.

Books Recommended:-
Text Books:-

1.	Digital Electronics and Applications, McGraw Hills Publishers.	-	Malvino Leach
2.	Digital Logic and Computer Design, Prentice Hall of IndiaLtd., New Delhi.	-	Morries Marrow
3.	Digital Integrated Electronics, Prentice Hall of India Ltd.,New Delhi	-	Herbert Raub and Donals Sachilling
4.	Digital Electronics, Prentice Hall of India Ltd., New Delhi	-	Rajaraman
5.	Microelectronics, McGraw Hill, 1987	-	J. Millman and A. Grabel

Reference Books:

1.	Digital Principles, Latest Edition, 2000, Tata McGraw Hill Publishing Company Ltd., New Delhi	-	Malvino & Leach
2.	Modern Digital Electronics, Second Edition, 2000, Tata McGraw Hill Publishing Company Ltd., New Delhi	-	R.P. Jain
3.	Digital Electronics, First Edition, 2000, Tata McGraw Hill Publishing Company Ltd., New Delhi	-	V.K. Puri
4.	Electronics Circuits and Systems, 1992, Tata McGraw Hill Publishing Company	-	Y.N. Bapat

Operating System (DIP3CS05)

Objectives:
- Students will learn how Operating System is Important for Computer System.
- To make aware of different types of Operating System and their services.
- To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
- To know virtual memory concepts.
- To learn secondary memory management.

Outcomes:
- Understands the different services provided by Operating System at different level.
- They learn real life applications of Operating System in every field.
- Understands the use of different process scheduling algorithm and synchronization techniques to avoid deadlock.
- They will learn different memory management techniques like paging, segmentation and demand paging etc.

CONTENTS: Theory

Unit-1
INTRODUCTION
Evaluation of Operating Systems, Types of Operating Systems, Different views of the Operating Systems, OS concepts

Unit-2
PROCESSES
The Process Concept, The Operating System view of Processes, Operating System Services for Process Management, Process Scheduling, PerformanceEvaluation.

Unit-3
COMPUTER SYSTEM & OS STRUCTURE
Operation, I/O Structure, Storage Structure, Storage Hierarchy, OS Components, OS Services, System Calls, System Program, System Designand implementation, System Generation

Unit-4
CPU SCHEDULING
Basic Concepts, Scheduling Criteria, Scheduling Algorithm (FCFS, SJF, PRIORITY, RR)

Unit-5
MEMORY MANAGEMENT
4.1 Contiguous Allocation
Single Process Monitor, Partitioned memory allocation static, Partitioned memory allocation-Dynamic, segmentation
4.2 Non-contiguous Allocation
Paging, Virtual Memory(allocation policies and replacement policies)

Unit-6
FILE MANAGEMENT
File Concept, Access Method, Directory Structure, Protection

Unit-7
CASE STUDY
7.01 **LINUX OPERATING SYSTEM**
Introduction to Linux Operating System. Linux features & Benefits:
- **Introduction to Linux**:- Systems characteristics andrequirements with Linux.

Getting Started:-System manger, Password, Log in, Log out, running theSystem.

7.02 **UNIX OPERATING SYSTEM**

Introduction to UNIX Operating System. UNIX features & Benefits:-

Introduction to Linux:- Systems characteristics and requirements with Linux. **Getting Started**:-System manger, Password, Log in, Log out, running the system.

File in the Unix System:- File structure in Unix, Working with file structures, removable file volumes.

Unix Command Shells:- Issuing commands, Input handling by the shells, The shell programming language, Running the Unix shells, Pipes, Version of Unix Systems.

The System Kernel:- Nature of the Kernel, Process Co-ordinations and Management, Input and Output Operations and Output Operations.

Books /Reference Books-

1. Operating System Concepts, Addition-Wesley Publishing Company, 1989. **James L. Paterson,Abraham Silberschatz**

2. Modern Operating Systems, Prentice-Hall of India Private Ltd., 1995. **Andrew S. Tanenbaum**

3. First Course in Computers, Vikash Publishing House Pvt. Ltd., Jungpura, New Delhi. **Sanjay Saxena**

SEMESTER - 4								
THEORY		PERIOD			Evaluation Scheme			Credit
CODE	NAME OF THE PAPER	LECTURES	TUTORIALS	PRACTICALS	IA	ESE	SUB-TOTAL	
DIP4CS01	OOPS using JAVA	4	0	0	30	70	100	4
DIP4CS02	Database Management System	4	0	0	30	70	100	4
DIP4CS03	Data Structure Using 'C'	4	0	0	30	70	100	4
DIP4CS04	WP(HTML+CSS)	3	0	1	30	70	100	4
DIP4CS05L	DBMS LAB	0	0	2	15	35	50	2
DIP4CS06L	DS LAB	0	0	2	15	35	50	2
DIP4CS07L	JAVA LAB	0	0	4	30	70	100	4
							Total credit:	24

OOPS using JAVA (DIP4CS01)

Course Objectives:
1. To understand the basic concepts and fundamentals of platform independent object oriented language.
2. To demonstrate skills in writing programs using exception handling techniques and multithreading.
3. To understand streams and efficient user interface design techniques.

Course Outcomes:
After successful completion of the course, the students are able to
1. Use the syntax and semantics of java programming language and basic concepts of OOP.
2. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
3. Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.
4. Design event driven GUI and web related applications which mimic the real word scenarios.

Contents: Theory

Unit -1

Java Evolution and Overview of Java Language: How Java differs from C and C++, Java and Internet, Java and World Wide Web, Introduction, Simple Java Program, More of Java, An Application with Two Classes, Java Program Structure, Java Tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, and Programming Style.

Unit -2

Constants, Variables, and Data Types: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Values of Variables, Scope of Variables, Symbolic Constants, Type Casting, Getting Values of Variables, Standard Default Values.

Unit -3

Operators and Expressions: Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evolution of Expressions, Precedence of Arithmetic Operators, Type Conversion in Expressions, Operator Precedence and Associativity,

Mathematical Functions.

Unit -4

Decision Making and Branching: Introduction, Decision Making with if Statement, Simple If Statement, The if... else Statement, Nesting of if ... else Statements, The else if Ladder, The switch Statement, The? Operator.

Decision Making and Looping: Introduction, The while Statement, The do Statement, The for Statement, Jumps in Loops, Labelled Loops.

Unit -5

Classes, Objects and Methods: Introduction, Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance: Extending a. Class, Overriding Methods, final Variables and Methods, Final Classes, Finalizer Methods, Abstract Methods and Classes, Visibility Control.

Unit -6

Arrays, String and Vectors: Arrays, One-Dimensional Arrays, Creating an Array, Two- Dimensional Arrays, Strings, Vectors, Wrapper Classes.

Interfaces: Multiple Inheritance: Introduction, Defining Interfaces, Extending Interfaces, implementing Interfaces, Accessing InterfaceVariables.

Unit -7

Packages: Putting Classes Together: Introduction, Java API Packages, Using system Packages, Naming Conventions, Creating Packages, Accessing a Packages, Using a Package, Adding a Class to a Package, Hiding Classes.

Unit -8

Multithreaded Programming: Introduction, Creating Threads, Extending the Thread Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, and Synchronization.

Unit -9

Managing Errors and Exceptions: Introduction, Types of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using finally Statement, Throwing Our Own Exceptions, Using Exceptions for Debugging.

Text Book:
1. E. Balagurusamy, Programming with Java, A Primer Second Edition, Tata McGraw Hill, New Delhi.

Reference Books:
1. H.M.Deitel&P.J.Deitel- JA V A- How to Program, 5th Edn, Pearson Education, New Delhi-2004.

2. P.Naughton and H. Schildt-JAVA: The Complete Reference, TMH, New Delhi 2005.

Database Management System (DIP4CS02)

Course Objectives:
1. The main objective of this course is to enable students to the fundamental concepts of database analysis and design.
2. To recognize the importance of database analysis and design in the implementation of any Database application and to understand the process of drawing the ER-Diagrams.
3. It also gives the knowledge of the roles of transaction processing and concurrency control.

Course Outcomes:
 CO1) Understand the basic principles of database management systems.
 CO2) Draw Entity-Relationship diagrams to represent simple database application scenarios
 CO3) write SQL queries for a given context in relational database.
 CO4) Discuss normalization techniques with simple examples.
 CO5) Describe transaction processing and concurrency control concepts.

Contents: Theory

Unit -1
INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS(DBMS):
Why Database, Characteristics of Data in Database, DBMS, What isdatabase Advantage of DBMS

Unit -2
DATABASE ARCHITECTURE AND MODELLING:
Conceptual, physical and logical database models, Role of DBA, DatabaseDesign

Unit -3
ENTITY RELATIONSHIP MODEL:
Components of ER Model, ER Modeling Symbols, Super Class and SubClass types

Unit -4
RELATIONAL DBMS:
Introduction to Relational DBMS, Cardinality, tuples, attribute.

Unit -5
RELATIONAL ALGEBRA AND RELATIONAL CALCULUS:
Relational Algebraic operations, Tuple Relational Calculus

Unit -6
INTRODUCTION TO SQL:
History of SQL, Characteristics of SQL Advantages of SQL, and SQL in Action SQL data types and Literals, Types of SQL commands, SQL Operators and their precedence, Queries and Sub queries Aggregate functions, Insert, Update and Delete operations. Joins, Unions

Unit -7
DATABASE NORMALISATION:
Keys, Relationships, First Normal Form, Functional dependencies,Second Normal Form, Third Normal Form,

Unit -8
BACK UP AND RECOVERY:
Database backups; why plan backups? Hardware protection and redundancy, Transaction logs. Importance of backups, Databaserecovery

Unit -9
DATABASE SECURITY AND INTEGRITY:
Types of Integrity constraints, Restrictions on Integrity constraints, Data security risks, Data security requirements, Database users, protecting data within the database, Granting and revoking privilegesand roles.

Text Books /Books Recommended:-

1.	Database Management Systems, First Edition, 2002, Vikas Publishing House	-	A. Leon & M. Leon
2.	Fundamentals of Database Systems, Third Edition, 2000, Addison Wesley	-	R. Elmasri, S. Navathe

Reference Books:-

1.	Database System Concepts, Third Edition, 1997, McGraw-Hill Internation	-	H. Korth, A. Silberschatz
2.	An Introduction to Database Systems, Galgotia Publication	-	B. Desai
3.	Database Processing: Fundamentals, Design Implementation, Prentice Hall of India.	-	D.K. Kroenke
4.	Database Management Systems, First Edition, 1996, McGraw Hill	-	P. Bhattacharya and A.K. Majumdar
5.	Database System Concepts, Fourth Edition, 1997, Tata McGraw Hill	-	Abraham Silberschtz, Henry Korth & S. Sudarshan

Data Structure Using 'C' (DIP4CS03)

COURSE OBJECTIVES:
- ➢ 1 To impart the basic concepts of data structures and algorithms
- ➢ To understand concepts about searching and sorting techniques
- ➢ To Understand basic concepts about stacks, queues, lists, trees and graphs
- ➢ To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures

COURSE OUTCOMES:
- ➢ Ability to analyze algorithms and algorithm correctness.
- ➢ Ability to summarize searching and sorting techniques
- ➢ Ability to describe stack, queue and linked list operation.
- ➢ Ability to have knowledge of tree and graphs concepts.

Contents: Theory

Unit -1
BASIC CONCEPTS OF DATA REPRESENTATION:
Abstracting data types: Fundamental and derived data types, Primitivedata structures.

Unit -2
INTRODUCTION TO ALGORITHM DESIGN AND DATA STRUCTURES:
Design and analysis of algorithm: Algorithm definition, comparison of algorithms, Analysis of Algorithm; Frequency count, Complexity measures in terms of time and space.

Unit -3
ARRAYS:
Representation of arrays: single and multidimensional arrays. Address calculation using column and row major ordering. Various operationson Arrays, Application of arrays: Matrix multiplication.

Unit -4
STACKS AND QUEUES:
Representation of stacks and queues using arrays and linked-lists,Circular queues, Priority Queue

Unit -5
LINKED LISTS:
Singly linked list; operations on list. Linked stacks and queues, Circularlinked lists, doubly linked lists

Unit -6
TREES:
Binary tree traversal methods: Preorder, In-order, Post-order traversal. Recursive and non-recursive Algorithms for above mentioned Traversalmethods. Representation of trees and its applications: Binary tree representation.
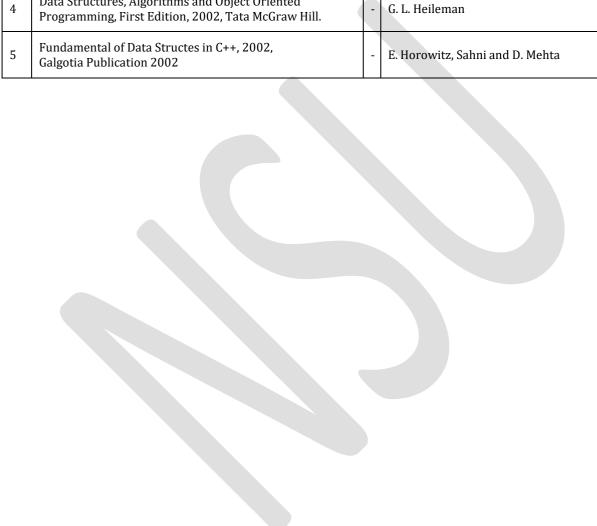
Unit -7
SEARCHING, SORTING AND COMPLEXITY:
Searching: Sequential and binary searches Sorting: selection, bubble,Quick, merge.

Unit -8
GRAPHS:
Graphs representation: Adjacency matrix, Adjancy lists, TraversalSchemes: Depth first search, Breadth first search.

Books Recommended:-

1	Data Structure Using C and C++, Second Addition, 2000, Prentice Hall of India.	-	Y. Langsam, M. J. Augustein and A. M. Tanebaum
2	Data Structure Using C and C++, Second Addition, 2000, Prentice Hall of India.	-	R. Kruse, C. L. Tonodo and B. Leung
3	Data Structure through "C" Language, First Edition, 2001, BPB Publication	-	S. Chottopadhyay, D. Ghoshdastidar & M. Chottopadhyay
4	Data Structures, Algorithms and Object Oriented Programming, First Edition, 2002, Tata McGraw Hill.	-	G. L. Heileman
5	Fundamental of Data Structes in C++, 2002, Galgotia Publication 2002	-	E. Horowitz, Sahni and D. Mehta

Web Programming (HTML+ CSS) (DIP4CS04)

Course Objectives:
- ➢ Learn how to design and develop a web page using HTML and CSS.
- ➢ Design and develop a web site using text, images, links, lists, and tables for navigation and layout.
- ➢ Style your page using CSS.
- ➢ Learn how to use database in web design.

Course Outcomes:
- ➢ Describe the concepts of WWW including browser and http protocol.
- ➢ List the various HTML tags and use them to develop the user friendly web pages.
- ➢ Define the CSS with its types and use them to provide the styles to the web pages at various levels.
- ➢ Develop the modern web pages using the html and CSS features with different layouts as per need of applications.

Contents: Theory

Unit -1
HTML: HTML-Introduction-tag basics- page structure-adding comments working with texts, paragraphs and line break. Emphasizing test- heading and horizontal rules-list-font size, face and color-alignment links-tables-frames

UNIT-2
Forms & Images Using Html: Graphics: Introduction-How to work efficiently with images in web pages, image maps, GIF animation, adding multimedia, data collection with html forms textbox, password, list box, combo box, text area, tools for building web page front page

UNIT-3
XML & DHTML: Cascading style sheet (CSS)-what is CSS-Why we use CSS-adding CSS to your web pages-Grouping styles-extensible markup language (XML). Dynamic HTML: Document object model (DCOM)-Accessing HTML & CSS through DCOM Dynamic content styles & positioning-Event bubbling-data binding.

UNIT-4
Web hosting - what is domain? Introduction to DNS, how to register a domain?, what is web hosting ?, how to get a web hosting ?, host your website on web server. FTP - FTP introduction, FTP commands viewing files and directories, FTP commands transfer and rename files, FTP with WS FTP/ CuteFTP, Filezilla on Windows.

Text Books:
1. Ivan Bay Ross- Web Enable Commercial Application Using HTML, DHTML, BPB Publication
2. Michel Morrison -HTML and XML for Beginners, PHI, New Delhi- 2001
3. H.M Dietal and P.J Dietal -Java How to Program, PHI, New Delhi- 2005

Reference Book:
2. Java Server Side Programming -WROX Publication

SEMESTER - 5								
THEORY		PERIOD			Evaluation Scheme			Credit
CODE	NAME OF THE PAPER	LECTURES	TUTORIALS	PRACTICALS	IA	ESE	SUB-TOTAL	
DIP5CS01	Advance WP(JS+web services)	4	0	0	30	70	100	4
DIP5CS02	Introduction to PHP	4	0	0	30	70	100	4
DIP5CS03	Environmental Science	4	0	0	30	70	100	4
DIP5CS04	Data Communication & Networking	4	0	0	30	70	100	4
DIP5CS05L	PHP LAB	0	0	4	30	70	100	4
DIP5CS06L	AWP LAB	0	0	4	30	70	100	4
							Total credit:	24

Advance Web Programming (JS+ Web Services) (DIP5CS01)

Course Objectives:
1. To Understand Web Services and implementation model for SOA
2. To Understand the SOA, its Principles and Benefits
3. To Understand XML concepts
4. To Understand paradigms needed for testing Web Services
5. To explore different Test Strategies for SOA-based applications

Course Outcomes:
At the end of this course student will:
CO1) Understand the principles of SOA
CO2) Efficiently use market leading environment tools to create and consume web services
CO3) Indentify and select the appropriate framework components in creation of webservice solution
CO4) Apply OOP principles to creation of webservice solutions.

UNIT-1
HTML5
Introduction, Why HTML5? Formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors.
HTML5 Page layout and navigation: Creating navigational aids: planning site organization, creating text based navigation bar, creating graphics based navigation bar, creating graphical navigation bar, creating image map, redirecting to another URL, creating division based layouts: HTML5 semantic tags, creating divisions, creating HTML5 semantic layout, positioning and formatting divisions.

UNIT-2
Java Script
2.1 Introduction
2.2 Lexical Structure
2.3 Variables, Identifiers, Data Types and Values, Scope, Literals, Reserved Words
2.4 Expression and operators, Statements
2.5 Arrays, Objects (Math, String, Date)
2.6 Functions
2.7 Regular Expressions
2.8 Garbage Collection

UNIT-3
Introduction
Evolution and Emergence of Web Services – Evolution of distributed computing. Core distributed computing technologies – client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, Introduction to Web Services – The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

UNIT-4
Web Service Architecture – Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services.

Text Books
1. Web Services & SOA Principles and Technology, Second Edition, Michael P. Papazoglou.
2. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.
3. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.

References
1. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.
2. Building web Services with Java, 2nd Edition, S. Graham and others, Pearson Education.
3. Java Web Services, D.A. Chappell & T. Jewell, O"Reilly, SPD.
4. McGovern, et al., "Java web Services Architecture", Morgan Kaufmann Publishers, 2005.

Introduction to PHP (DIP5CS02)

Objectives:
- Learn Core-PHP, Server Side Scripting Language.
- Learn to design dynamic and interactive Web pages.
- Learn PHP-Database handling.

Outcomes:
- Able to design dynamic and interactive web pages, websites.
- Able to run PHP scripts on server and retrieve results.
- Able to handle databases like MySQL using PHP in web sites.

UNIT-I

Introduction: What is PHP? – History of PHP – Installing PHP – Language Basics: Lexical Structure – Data types – What's a Variable? PHP variable and value types – Using PHP Variables – Expression and Operators – Flow Control statements.

UNIT-II

Functions: Calling a function – Defining a function – Introduction to Strings – Comparing Strings – Manipulating and Searching strings – Arrays: Types of Arrays – Array functions – Storing data in Arrays.

UNIT-III

Form Handling – Form Validation – $_GET variable – $_ POST variable – $_REQUEST variable – Creating the Form –#Creating the Upload script – Using your File system: File paths and permissions – Displaying directory contents – Working with fopen( ) and fclose( ).

UNIT-IV

Using Cookies: What are Cookies? – Setting Cookies – Using Cookie variables – Session Basics: What's a session? – Understanding Session variables – Managing User preferences with Sessions – Graphics: Drawing functions – Creating and Drawing images.

UNIT-V

Installing and Configuring MySQL – Establishing a connection and poking around – Creating a database table – Inserting data into the table – Selecting and displaying data.

Text Books:
1. VIKRAM VASWANI, "PHP and MySQL", Tata McGraw-Hill, 2005
2. BEN FORTA , "MySQL Crash course " SAMS, 2006.
3. C.J. DATE, "An Introduction to Database Systems", Addison Wesley, Sixth Edition.
4. Ramesh Elmasri and Shamkant B Navathe," Fundamentals of DataBase Systems",Pearson Education,Third Edition.

Reference Books:
1. Tim Converse, Joyce Park and Clark Morgan, "PHP 5 and MySQL", Wiley India reprint, 2008.
2. Robert Sheldon, Geoff Moes, "Beginning MySQL", Wrox, 2005.
3. Alexis Leon and Mathews Leon, "Database Management Systems", Vikas, 2008.

Environmental Science (DIP5CS03)

Course Outcomes:
- Students will enable to understand environmental problems at local and national level through literature and general awareness.
- The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues.
- The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems.
- Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world

Contents: Theory

Unit -1
Ecosystems and how they work: Structure and function of an ecosystem**,** Types of Eco-Systems, Producers, Consumers and Decomposers, Food chains, food webs and ecological pyramids, Energy flow in the ecosystem. Introduction, Types, Characteristic features, Structure and Function of Forest ecosystem, Desert ecosystem, Aquatic ecosystems Lithosphere, Biosphere and Hydrosphere, Major issues of Biodiversity, Biosphere reserves, National Parks and sanctuaries.

Unit -2
Concept of sustainability and international efforts for environmentalprotection:
Concept of Sustainable Development, Emergence of Environmental Issues, International Agreement on Environmental Management.
Human Population Growth and its effects on the environment: Problem of Population growth, poverty and environment, Population Explosion, Family Welfare Programme.

Unit -3
Renewable and non-renewable resources: Defining resources, classification of resources, soil and land degradation, economicdevelopment and resources use, natural resources accounting. Energyneeds, renewable and non-renewable energy resources, Solar energy and its availability, wind power and its potential, hydropower as a clean source of energy, coal, oil, natural gas etc., bio fuel.

Unit -4
Pollution and Public Policy
Water Pollution: Water resources of India, Hydrological Cycle, methods of water conservation and management, ground and surface water pollution. Recycling and management of water and wastewater (domestic and industrial). Water borne diseases and health related issues.
Air Pollution: Air pollution and air pollutants, sources of air pollution, its effect on human health and vegetation. Greenhouse effect, global warming and climate change. Ambient air quality standards, steps taken by Government to control air pollution.
Noise pollution and its impacts on human health.
Solid Waste: Municipal Solid Waste Management, segregation, disposal methods, composting, land fill sites etc. Hazardous waste management, biomedical waste management.

Unit -5
Environmental Impact Assessment (EIA) and EnvironmentalManagement System (EMS): Introduction to EIA, its impact and case study, environmentalinformation system (EIS), role of information technology in environment.

Unit -6
Indian Environmental laws: Legal framework: Constitutional provisions, the Indian Penal Code, Role of Judiciary in Environmental Protection, Wild Life (Protection) Act, 1972, Water (Prevention and Control of Pollution) Act, 1974, Environment (Protection) Act, 1986, Air (Prevention & Control of Pollution) Act, 1981, Forest Conservation Act

Text Books:

1. Gupta N.C.; Social Auditing of Environmental Law in India, edited book, New Century publications, Delhi-2003.
2. Divan, Shyam and RosenCeranz; Armin. Environmental Law and Policy in India, Cases, materials and statutes, second edition, Oxford University Press, 2001.
3. Uberoi, N.K.; Environmental Management, Excel Books, New Delhi,2000.
4. Agarwal, A, Narain; S. State of India's Environment, Published by Centre for Science and Environment, New Delhi, 1999.
5. Ambasht, R.S. and P.K. Ambasht; Environment and Pollution-AnEcological Approach, third edition, CBS Publishers, New Delhi, 1999.

Data Communication & Networking (DIP5CS04)

Course Objectives:

To introduce the basics of data communications and computer networks.

To examine and understand network protocols and architectures.

To educate the student in modern networking technologies.

Course Outcomes

➢ Understand and Contrast the concept of Signals, OSI & TCP/IP reference models and discuss the functionalities of each layer in these models.

➢ Discuss and Analyse flow control and error control mechanisms and apply them using standard data link layer protocols

➢ Design subnets and calculate the IP addresses to fulfill network requirements of an organization

➢ Analyze and apply various routing algorithms to find shortest paths for packet delivery.

➢ Explain the details of Transport Layer Protocols (UDP, TCP) and suggest appropriate protocol in reliable/unreliable communication.

➢ Analyze the features and operations of various application layer protocols such as HTTP, DNS and SMTP.

Contents: Theory

Unit -1

Data Transmission Basic Concepts and Terminology: Data Communication Model, Communication Tasks, Parallel & Serial Transmission, Transmission Models, Transmission Channel, Data Rate, Bandwidth Signal Encoding Schemes, Data Compression, Transmission Impairments, Layering and Design Issues, OSI Model, Services and Standards.

Unit -2

Computer Network: Network Topology, Performance of Network, Network Classification, Advantages & Disadvantages of Network, Transmission Media (guided and unguided), Network Architecture, OSI Reference Model, TCP/IP.

Unit -3

Data Link Layer: Need for Data Link Control, Frame Design Consideration, Flow Control & Error Control (Flow control mechanism, Error Detection and Correction techniques) Data Link Layer Protocol, and HDLC.

Unit -4

Network Layer: Routing, Congestion control, Internetworking principles, Internet Protocols (IPv4 packet format, Hierarchaladdressing sub netting, ARP, PPP), Bridges, and Routers.

Unit -5

Physical Layer: Function and interface, physical layer standard,null modem.

Unit -6

Network Security: Security Requirement, Data encryptionstrategies, authentication protocols, Firewalls.

Text Book:

1. Prakash C. Gupta -Data Communications & Computer Networks, PHI, New Delhi.

2. Behrouz Forouzan, Introduction to Data Communications and Networking, Tata McGraw Hill

Edition 1999

Reference Books:

1. William Stallings- Data & Communications, 6th Edition, Pearson Education.
2. Tanenbaum- Computer Networks, 3rd Edition, PHI, New Delhi.

THEORY		PERIOD			Evaluation Scheme			Credit
CODE	NAME OF THE PAPER	LECTURES	TUTORIALS	PRACTICALS	MSE	ESE	SUB-TOTAL	
DIP6CS01	Computer Graphics	4	0	0	30	70	100	4
DIP6CS02	Introduction to Python	4	0	0	30	70	100	4
DIP603	Introduction to Management	4	0	0	30	70	100	4
DIP6CS04	Elective (Any One)	4	0	0	30	70	100	4
DIP6CS05	Project & viva (SIP)	0	1	0	0	0	100	4
DIP6CS06L	PYTHON LAB	0	0	2	15	35	50	2
DIP6CS07L	CG LAB	0	0	2	15	35	50	2
							Total credit:	24

Total Credits=152

Computer Graphics (DIP6CS01)

COURSE OBJECTIVES:
- ➢ The main objective of the course is to introduce students with fundamental concepts and theory of computer graphics.
- ➢ It presents the important drawing algorithm, polygon fitting, clipping and 2D transformation curves and an introduction to 3D transformation.
- ➢ It provides the basics of OpenGL application programming interface which allows students to develop programming skills in CG.

COURSE OUTCOMES:
Upon the completion of the course students will be able to:-
CO 1 – Explain the applications, areas, and graphic pipeline, display and hardcopy technologies.
CO 2 – Apply and compare the algorithms for drawing 2D images also explain aliasing, anti aliasing and half toning techniques.
CO 3 – Discuss OpenGL application programming Interface and apply it for 2D & 3D computer graphics.
CO 4 – Analyze and apply clipping algorithms and transformation on 2D images.
CO 5 – Solve the problems on viewing transformations and explain the projection and hidden surface removal algorithms.

Contents: Theory
Unit -1
Overview of Graphics Systems: Video Display Devices, Refresh Cathode Ray Tubes, Raster-Scan and Random-Scan Systems, Input Devices, Hard- Copy Devices and Graphics Software.

Unit -2
Output Primitives: Points, Line Drawing Algorithms (DDA and Bresenham's Line Drawing Algorithm), Circle- Generating Algorithms (Bresenham's and Midpoint Circle Algorithms), Ellipse-Generating Algorithms (Midpoint Ellipse Algorithm only), Filled-Area Primitives: Scan –Line Polygon Fill Algorithm, Boundary-Fill Algorithm, Flood-Fill Algorithm.

Unit -3
Two Dimensional Geometric Transformations: Basic Transformations, Matrix 13 Representations and Homogeneous Coordinates, Composite Transformations, Reflection and Shear, Transformations between Coordinates Systems, Raster Methods for Transformations.

Unit -4
Two-Dimensional Viewing: The Viewing Pipeline, Viewing Coordinate Reference Frame, Window-to-View Port Coordinate Transformation, Clipping- Point, Line (Cohan-0Sutherland Line Clipping and Liang –BarskyLine Clipping and Nicholl-Lee-Nicholl Line Clipping) and Polygon Clipping(Sutherland-Hodgeman Polygon Clipping, Weiler-AthertonPolygon Clipping).

Unit -5
Three Dimensional Geometric Transformations: Translation, Rotation, Scaling, Reflection and Shears, Composite Transformations, Modeling and Coordinate Transformations.
Three Dimensional Viewing: Viewing Pipeline, Viewing Coordinates, Projections and Clipping.

Text Books:
1. D. Hearn & M. P. Baker -Computer Graphics C Version, 2nd Edn, Pearson Education, NewDelhi, 2006
2. J. F. KoegelBuferd -Multimedia Systems, Pearson Education, New Delhi, 2006
Reference Books:
1. R.A. Plastock et.al.- Computer Graphics(Schaums Outline Series), 2nd Edn, TMH, New Delhi,2006.
2. J.D.Foley- Computer Graphics, 2nd Edn, Pearson Education, New Delhi, 2004

Introduction to Python (DIP6CS02)

Course Objectives:
1. To learn programming in core Python
2. To develop programs in Python using lists, tuples and strings
3. To develop the skills to create file and function in Python
4. To gain knowledge of Object-Oriented implementation in Python
5. To use database and GUI applications in Python Course

Outcomes:
1. Create programs in Python programming language
2. Develop programs in Python using lists, tuples and strings
3. Prepare programs implementing file and function in Python
4. Implement Object Oriented concept in Python programming
5. Implement database and GUI applications in Python

Unit 1
Introduction to Python: Python variables, Python basic Operators, Understanding python blocks. Python Data Types, Declaring and using Numeric data types: int, float etc.

Unit 2
Python Program Flow Control Conditional blocks: if, else and else if, Simple for loops in python, For loop using ranges, string, list and dictionaries. Use of while loops in python, Loop manipulation using pass, continue, break and else. Programming using Python conditional and loop blocks.

Unit 3
Python Complex data types: Using string data type and string operations, Defining list and list slicing, Use of Tuple data type. String, List and Dictionary, Manipulations Building blocks of python programs, string manipulation methods, List manipulation. Dictionary manipulation, Programming using string, list and dictionary in-built functions. Python Functions, Organizing python codes using functions.

Unit 4

Python File Operations: Reading files, Writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines() Manipulating file pointer using seek Programming, using file operations. Database Programming: Connecting to a database, Creating Tables, INSERT, UPDATE, DELETE and READ operations.

Unit 5

Classes, modules and exceptional handling: Classes: Introduction, Member variables and defining methods, constructor, destructor, data encapsulation, inheritances, multiple inheritances, diamond problem solving technique of python.

Text Books and Reference Books:

1. Chun, J Wesley, Core Python Programming, Second Edition, Pearson, 2007 Reprint 2010

2. Barry, Paul, Head First Python, 2nd Edition, O Rielly, 2010

3. Lutz, Mark, Learning Python, 4th Edition, O Rielly, 2009

Introduction to Management (DIP6CS03)

Course objectives:
- ➢ To enable the students to study the evolution of Management,
- ➢ To study the functions and principles of management.
- ➢ To learn the application of the principles in an organization.
- ➢ To enable the effective and barriers communication in the organization
- ➢ To study the system and process of effective controlling in the organization.

Course Outcomes

On completion of this course, the students will be able to

CO1: Understand the concepts related to Business.

CO2: Demonstrate the roles, skills and functions of management.

CO3: Analyze effective application of PPM knowledge to diagnose and solve organizational problems and develop optimal managerial decisions.

CO4: Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.

Unit -1
Overview of Business:-
1.1. Types of Business
- Service
- Manufacturing
- Trade

1.2. Industrial sectors

Introduction to

- Engineering industry
- Process industry
- Textile industry
- Chemical industry
- Agro industry

1.3 Globalization
- Introduction
- Advantages & disadvantages w.r.t. India

1.4 Intellectual Property Rights (I.P.R.)

Unit -2
Management Process:-
2.1 What is Management?
- Evolution
- Various definitions
- Concept of management
- Levels of management
- Administration & management
- Scientific management by F.W.Taylor

2.2 Principles of Management (14 principles of Henry Fayol)
2.3 Functions of Management
- Planning
- Organizing
- Directing
- Controlling

Unit - 3
Organizational Management
3.1 Organization :-
- Definition
- Steps in organization

3.2 Types of Organization
- Line
- Line & staff
- Functional
- Project

3.3 Department
- Centralized & Decentralized
- Authority & Responsibility
- Span of Control

3.4 Forms of Ownership

- Propriotership

- Partnership
- Joint stock

Unit –4
Human Resource Management

   4.1 Personnel Management
- Introduction
- Definition
- Functions

   4.2 Staffing
- Introduction to HR Planning
- Recruitment Procedure

   4.3 Personnel– Training & Development
- Types of training
  - ➢ Induction
  - ➢ Skill Enhancement

   4.4 Leadership & Motivation
- Maslow's Theory of Motivation

   4.5 Safety Management
- Causes of accident
- Safety precautions

   4.6 Introduction to –
- Factory Act
- ESI Act
- Workmen Compensation Act
- Industrial Dispute Act

   Unit –5
Financial Management:-
    5.1. Financial Management- Objectives & Functions
    5.2. Capital Generation & Management
- Types of Capitals
- Sources of raising Capital

    5.3. Budgets and accounts
- Types of Budgets
  - ➢ Production Budget (including Variance Report)
  - ➢ Labour Budget
- Introduction to Profit & Loss Account (only concepts); Balance Sheet

    5.4 Introduction to–
- **Excise Tax**
- **Service Tax**
- **Income Tax**

   Unit –6
Materials Management
    6.1. Inventory Management (No Numericals)
- Meaning & Objectives

   6.2 ABC Analysis
   6.3 Economic Order Quantity
- Introduction & Graphical Representation

6.4   Purchase Procedure
- Objects of Purchasing
- Functions of Purchase Dept.
- Steps in Purchasing

6.5   Modern Techniques of Material Management
- Introductory treatment to JIT / SAP/ ERP

Titles of the Book	Name of Authors
Industrial Engg & Management	Dr. O.P. Khanna
Business Administration & Management	Dr. S.C. Saksena
The process of Management	W.H. Newman E.Kirby WarrenAndrew R. McGill
Industrial Management	Rustom S. Davar
Industrial Organisation & Management	Banga & Sharma
Industrial Management	Jhamb & Bokil
The fundamental of design management	Kathryn Best

Elective (Any One) (DIP6CS04)

COURSE OBJECTIVES
- ➤ To understand Basic Concepts of Artificial Intelligence and Expert Systems.
- ➤ To provide knowledge on Various Techniques and Tools involved in Artificial Intelligence

Course Outcomes:

On completion of the course, student will be able to

CO1 - Understand the Basics about Artificial Intelligence and Expert Systems.

CO2 - Understand the Programming Logics in Artificial Intelligence.

CO3 - Understand various search methods in Artificial Intelligence.

CO4 - Understand the Knowledge about the Expert Systems.

CO5 - Understand The Image processing and analysis.

CO6 - Understand the latest developments in Knowledge systems and Tools.

(i) Artificial Intelligence & Expert System

Contents: Theory

Unit -1

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success.

Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem

Heuristic search techniques: Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

Unit -2

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation.

Using Predicate Logic: Represent ting Simple Facts in logic,

Representing instances and is a relationship, Computable function and predicate.

Unit -3

Natural language processing: Introduction syntactic processing,Semantic processing, Discourse and pragmatic processing.

Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction,Explanation based learning.

Unit -4

Expert System: Introduction, Representing using domain specificknowledge, Expert system shells.

Suggested Readings

1. David W. Rolston: Principles of Artificial Intelligence and Expert System Development, McGraw Hill Book Company.

2. Elaine Rich, Kevin Knight: Artificial Intelligence, Tata McGraw Hill.

3. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999.

4. Nils J Nilsson, "Artificial Intelligence -A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

(ii) Multimedia

COURSE OBJECTIVES

- The **objective** of this subject is to teach the principles of how different types of media can be processed and presented by computers.
- It introduces how multimedia can be used in various application areas.
- It provides a solid foundation to the students so that they can identify the proper applications of multimedia, evaluate the appropriate multimedia systems and develop effective multimedia applications.

Contents: Theory

Unit -1

Definitions - CD-ROM and the Multimedia Highway - where to use Multimedia - introduction to Making Multimedia: The stages of a Project - What you need - Multimedia Skills and Training: The terms - Macintosh and Windows Production Platforms: Macintosh Verses PC - The Macintosh Platform - The Windows Multimedia PC platform - Networking Macintosh and Windows Computers - Hardware Peripherals Connection - Memory and Storage Devices - Input Devices - Output Hardware - Communication Devices.

Unit -2

Text Editing and Word Processing Tools - OCR Software - Painting and Drawing Tools - 3-D Modeling and Animation Tools - Image - Editing Tools - Sound Editing Tools - Animation, Video and Digital Movies Tools - Helpful Accessories - Making Instant Multimedia: Linking Multimedia Objects - Office Suites - Word Processors - Spread sheets - Databases - Presentation Tools. Multimedia Authoring Tools: Types of Authoring Tools - Card and page Based Authoring Tools - Icon - Based Authorised Tools - Time Based Authoring Tools - Object - Oriented Authoring Tools - Cross - Platform Authoring Notes.

Unit -3

The Power of Meaning - About Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext - Sound: The Power of Sound - Multimedia System Sounds - MIDI Versus Digital studio - Digital Audio - Making MIDI Audio - Audio File Formats - Working with Sound on the Macintosh - Notation Interchange File Format (NIFF) - Adding Sound to Your multimedia Project - Toward professional Sound - The Red Books standard production tips.

Text Books:

1. Tay Vaughan - Multimedia: Making it work - Fourth Edition - Tata McGraw-Hill Edition - 1999.

2. Walterworth John A - Multimedia Technologies and Application - Ellis Horwood Ltd. - London- 1991.

(iii) Software Project Management and Quality Assurance

COURSE OBJECTIVES:
- Introduce basic concepts of software testing
- Understand white box, block box, object oriented, web based and cloud testing
- Know in details automation testing and tools used for automation testing
- Understand the importance of software quality and assurance software systems development.

COURSE OUTCOMES:
- CO1   Describe fundamental concepts of software quality assurance.
- CO2   Explore test planning and its management.
- CO3   Understand fundamental concepts of software automation.
- CO4   Apply Selenium automation tool for testing web based application.
- CO5   Demonstrate the quality management, assurance, and quality standard to software system.
- CO6   Demonstrate Software Quality Tools and analyze their effectiveness.

Contents: Theory

Unit -1

Introduction and Software Project Planning

Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

Unit -2

Project Organization and Scheduling

Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.

Unit -3

Project Monitoring and Control

Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI),
Schedule Performance Index

(SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

Unit -4

Software Quality Assurance and Testing

Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Cleanroom process.

Unit -5

Project Management and Project Management Tools
Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project.

Books:
1. Software Project Management by M. Cotterell
2. Information Technology Project Management
3. Management Information and Control by
4. Software Project Managemnet by S. A. Kelkar