Diploma LNCT University

SET-B Syllabus

Programming In C (201)/(DIP-201)

COURSE OUTCOMES:
After Completing the course student should be able to:

CO-1	Define Program, Algorithm and flow chart, list down and Explain various program development steps. Write down algorithm and flow chart for simple problems.
CO-2	Develop programs using input and output operations and use of command line arguments.
CO-3	Understand and apply control structures of a procedural programming Language
CO-4	Perform tests in programs by using the "if" and "switch" control flowbranching statements and repeat code segments by including "for, while, "and "do…while" control flow loops
CO-5	Define arrays and string handling functions and explain user-defined functions, structures and union.

COURSE CONTENTS:

UNIT I INTRODUCTION TO `C' PROGRAMMING:
Introduction of Algorithms, Flowcharts, structured programming Concepts, History and features of 'C', `C' Program structure, Pre-processor directives, Character set and data types, Character set of 'C', identifiers, keywords, variables, Constants, data types, int, float, double, char, Qualifiers, long, short, unsigned and signed, Comments. Operators and Expressions - Arithmetic, Relational, Logical, Assignment operators, unary & ternary operators, hierarchy of operators. • Input & Output Statements - Input and Output statements, printf(), scanf(), getchar(), putchar(), getch(),putch(), Conversion specifiers in format control string,

UNIT II DECISION CONTROL STATEMENTS:
Conditional branching statements: if statement, if- else, nested if use of logical operators and Compound Relational Tests • Unconditional branching: goto statement Multiple branching statements: switch case statement.

UNIT III LOOP CONTROL STATEMENTS:
Loop Statements: syntax and use of `for' statement, while statement, `Do-while' statement, `break-continue' statement, nested looping

UNIT IV ARRAYS & STRINGS:
Arrays: Concept of one dimensional and multi-dimensional array, array declaration, Array initialization, operations on one- and two-dimensional arrays. • String Manipulations- Strings, gets, puts, string operations, string function (concatenation, comparison, length of a string etc.)

UNIT V FUNCTIONS & MACRO:
Library and User-Defined Functions Concepts of library functions, Library functions (ceil(), floor(), exp(), log(), pow(), fmod(), abs(), fabs(), rand(), srand(), toupper(), tolower(), toascii() etc.) - user-defined Functions, Function declaration, Function prototype, local and global variables - Parameter passing mechanisms, recursion - Storage classes –static auto, extern, register - simples and Conditional Macros and Its expansions.**,** pointers, structure, union, and file handling:

Reference Books: -

1. Programming in C Balagurusamy, Tata Mc-Graw hill Publishing Company Ltd., New Delhi, IInd Edition 2000.
2. The Complete Reference 'C' Herbert Schildt,4 edition, McGraw-Hill Osborne Media.
3. Let us Learn 'C' Yashwant Kanetkar ,BPB Publications, B-14, Connaught Place, New Delhi, IIIrd Edition,2000.
4. The Spirit of C, Mullish Cooper, Jaico Publishing House, 121, N.G. Road, Mumbai.
5. Exploring C, Yashwant Kanetkar ,BPB Publications, B-14, Connaught Place New Delhi.
6. The C Programming Language Kernighan, Brian W.; Dennis M.Ritchie, Prentice Hall

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Applied Chemistry (202)/(DIP-202)

COURSE OUTCOMES:
After Completing the course student should be able to:

CO-1	Illustrate and summarize the structure and properties of matter and phenomenon involved in engineering.
CO-2	Classify, compare and infer some essential engineering materials.
CO-3	Describe and interpret industrial processes
CO-4	Analyze the contents of essential raw materials utilized in industrial procedures
CO-5	Provide the Required prerequisite knowledge to understand technical subjects.

COURSE CONTENTS:

UNIT I: **ATOMIC STRUCTURE, CHEMICAL BONDING AND SOLUTIONS**
Rutherford model of atom, Bohr's theory(expression of energy and radius to be omitted), orbital concept. Shapes of s, p and d orbital's, Pauli's exclusion principle, Hund's rule of maximum multiplicity Aufbau rule, electronic configuration up to atomic number 30 Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic bonding(NaCl example), covalent bond(H2,F2,HF hybridization in BeCl2,BF3,CH4,NH3,H2O), coordination bond in NH4 Solution – idea of solute, solvent and solution, methods to express the concentration of solution morality(M= mole per liter), ppm,

.**UNIT II WATER**:
Graphical presentation of water distribution on Earth(pie or bar diagram).Classification of soft and hard water based on soap test ,salts causing water hardness, unit of hardness and simple numerical on water hardness. Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler (scale and sludge, foaming and priming, corrosion etc), and quantitative measurement of water hardness by ETDA method, total dissolved solids (TDS) alkalinity estimation .i). Water softening techniques– soda lime process, zeolite process and ion exchange process. ii). Municipal water treatment (in brief only) – sedimentation, coagulation, filtration, sterilization.

UNIT III ENGINEERING MATERIALS::
Brief account of general principles of metallurgy. Extraction of-iron from hematite ore using blast furnace ,Alloys – definition, purposes of alloying, ferrous alloys and non-ferrous with suitable examples, properties and applications. General chemical composition, composition based applications (elementary idea only details omitted): Portland cement and hardening and setting of cemet. Composite materials. Polymers–monomer , homo and copolymers ,degree of polymerization, simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics(using PVC, PS, nylon-6,6 and Bakelite), rubber and vulcanization of rubber.

UNIT IV CHEMISTRY OF FUELS AND LUBRICANTS:
Definition of fuel and combustion of fuel, classification of fuels, calorific values (HCV and LCV),Proximate analysis of coal solid fuel Petrol and diesel-fuel rating(octane and cetane numbers),Chemical composition, calorific values and applications of LPG, CNG, water gas, coal gas, pro-ducer gas and biogas. Lubrication – function and characteristic properties of good lubricant, classification with ex-amples, physical properties (viscosity and viscosity index, oiliness, flash and fire point, could and pour point only

UNIT V ELECTRO CHEMISTRY:
Electronic concept of oxidation, reduction and redox reactions. Definition of terms: electrolytes, non-electrolytes with suitable examples, Faradays laws of electrolysis and simple numerical problems.

Industrial Application of Electrolysis–• Electrometallurgy• Electroplating• Electrolytic refining.• Introduction to Corrosion of metals –• definition, types of corrosion (chemical and electrochemical),H2liberation andO2absorption mechanism of electrochemical corrosion, factors affecting rate of corrosion. corrosion preventive measures–surface coatings and organic inhibitors
.

Reference Books: -

1. Engineering Chemistry II (Hindi) Mathur and Agarwal
2. Agarwal,& Shikha, Engineering Chemistry, Cambridge University Press; NewDelhi,2015.
3. Chemistry of Engineering Materials C.V. Agarwal
4. Engineering Chemistry P.C. Jain and Monika
5. Engineering Chemistry M.M. Uppal
6. Dr.Vairam, S., Engineering Chemistry,Wiley IndiaPvt.Ltd.,NewDelhi,2013.
7. Agnihotri, Rajesh, Chemistry for Engineers, Wiley IndiaPvt.Ltd.,2014.
8. Engineering Chemistry V.P.Mehta Jain Bros. Jodhpur
9. Practical Chemistry for Engineers Virendra Singh

List of suggestive core experiments: -

Perform any8 (eight) Laboratory Practicals at least one from each type

1. Preparation of standard solution of oxalic acid or potassium permanganate.
2. To determine strength of given sodium hydroxide solution by titrating against standard
3. oxalic acid solution using phenolphthalein indicator.
4. Standardization of KMnO4 solution using standard oxalic acid and Determine the percentage
5. of iron present in given Hematite ore by KMnO4 solution.
6. Volumetric estimation of
    a) Total hardness of given water sample using standard EDTA solution.
    b) Alkalinity of given water sample using 0.01M sulphuric acid
7. Proximate analysis of coal
    a) Gravimetric estimation moisture in given coal sample
    b) Gravimetric estimation ash in given coal sample
8. Instrumental analysis
9. Determine the conductivity of given water sample.
10. Determination of the Iron content in given cement sample using colorimeter.
11. . Determination of calorific value of solid or liquid fuel using bomb calorimeter.
12. . Determination of viscosity of lubricating oil using Redwood viscometer.
13. . Determination of flash and fire point of lubricating oil using Able's flash point apparatus.
14. . To verify the first law of electrolysis of copper sulfate using copper electrode.

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Fundamentals of Electrical and Electronics Engineering (203)/(DIP-203)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO-1	Define Electrical components and analysis of Kirchhoff's law
CO-2	Summarize and illustration of alternating quantity.
CO-3	Explanation of single and three phase circuits.
CO-4	Describe magnetic circuit and electrical machines
CO-5	Compare different number systems and electronic components

COURSE CONTENTS:

UNIT I: OVERVIEW OF ELECTRICAL COMPONENTS AND DC CIRCUIT: Definition of basic terms, such as current, EMF, Potential Difference (PD) Ohm's Law and its limitations Factors affecting resistors and capacitors; simple problems on series and parallel combinations of resistors. Application of Kirchhoff's current law and Kirchhoff's voltage law to simple circuits. Star – Delta connections and their conversion.

UNIT II: AC FUNDAMENTAL Concept of alternating quantities, Difference between ac and dc, Concepts of: cycle, frequency, time period, amplitude, instantaneous value, average value, rms. value, maximum value, form factor and peak factor, Representation of sinusoidal quantities by phasor diagrams, Equation of sinusoidal wave form for an alternating quantity. Effect of alternating voltage applied to a pure resistance, pure inductance and pure capacitance.

UNIT III: A.C. CIRCUITS. Concept of Resistance, inductive and capacitive reactance, Alternating voltage applied to R-L-C series, power in combined RLC circuits. active and reactive power and their significance, definition and significance of power factor. Definition of conductance, susceptance, admittance, impedance and their units. Introduction to polyphase a.c. systems, advantages of polyphase system over single phase system. Relations between line and phase value of voltages and currents for star and delta connections and their phasor diagram, power in polyphase circuits.

UNIT IV: MAGNETIC CIRCUITS & ELECTRICAL MACHINES: EMF, M.M.F, magnetic force, permeability, hysteresis loop, reluctance, leakage factor and BH curve, Electromagnetic induction, Faraday's laws of electromagnetic induction, Lenz's law Dynamically induced emf; Statically induced emf Equations of self and mutual inductance Analogy between electric and magnetic circuits. General construction and principle of transformers, Emf equation and transformation ratio, losses, Applications. Construction and working principle of Generator & Motors application.

UNIT V: BASIC ELECTRONICS Number system, Conversion Decimal to Binary, Decimal to Octal, Decimal to Hexadecimal, Binary to Decimal, Octal to decimal. Basic Logic Gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, half adder and full adder. Introduction to Transistors.

LIST OF PRACTICALS

1. Operation and use of measuring instruments viz voltmeter, ammeter, CRO, Wattmeter, multi-meter and other accessories.
2. Verification of Kirchhoff's Current Law in a dc circuit.
3. Verification of Kirchhoff's Voltage Law in a dc circuit.
4. Measurement of power and power factor in a single phase R-.L-.C. Circuit and calculation of active and reactive powers in the circuit.
5. Measurement of power in three phase circuit.
6. Open circuit test on single phase circuit to calculate losses.
7. Short circuit test on single phase circuit to calculate losses.
8. Ratio and polarity test on single phase transformer.
9. Study and verify the truth table of logic gates.
10. Study of DC Machine. Basic Electrical & Electronics Engineering
11. Study of Induction Machine.

Reference Books:

1. Basic Electrical & Electronics Engineering by Chaturvedi, Khare & Shahdev**,** Dhanpat Rai & Co.
2. Basic Electrical & Electronics Engineering 4th Ed. D P Kothari & I J Nagrath Mc Graw.
3. Text Book of Electrical Technology, Vol. 1 B L Theraja & A K Theraja. S Chand & Co.
4. Basic Electrical & Electronics Engineering by T R D Sinha.IPB Books

Applied Mechanics 204/(DIP-204)

COURSE OUTCOMES:

After completing this course, student will be able to:

CO-1	Identify the force systems for given conditions by applying the basics of mechanics.
CO-2	Determine unknown force(s) of different engineering systems.
CO-3	Determine support reactions through conditions of equilibrium for various structures.
CO-4	Find the centroid and centre of gravity of various components in engineering systems.
CO-5	Select the relevant simple lifting machine(s) for given purposes

COURSE CONTENT:

UNIT-1 Basics of mechanics and force system:

Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics. Space, time, mass, particle, flexible body and rigid body.

Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units. Force – unit, representation as a vector and by Bow's notation, characteristics and effects of a force, Principle of transmissibility of force, Force system and its classification.

UNIT-2 Resolution and Composition of forces:

Free Body Diagram, Composition of forces – Resultant, analytical method for determination of resultant for concur-rent, non-concurrent and parallel co-planar force systems – Law of triangle, parallelogram and polygon of forces. Moment of a Force, Principle of Moments/ Varignon's Theorem.

UNIT-3 Equilibrium:

Lami's Theorem – statement and explanation, Application for various engineering problems. Types of beam, supports (simple, hinged, roller and fixed) and loads acting on beam (vertical and inclined point load, uniformly distributed load, couple). Beam reaction for cantilever, simply supported beam with or without overhang – subjected to combination of Point load and uniformly distributed load.

UNIT-4 Centroid and Centre of Gravity:

Centroid, Centre of Gravity, Determination of Centroid of Simple Figures, Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter cir-cle,I-section,Z-section,L- section,C-section,T-section),difference between centroid and C.G.

Friction: Concept and types of friction, Limiting Friction, coefficient of friction, angle of friction, angle of repose, Laws of friction, Analysis of equilibrium of Bodies resting on Horizontal and inclined Plane.

UNIT-5 SIMPLE LIFTING MECHINES: Concept of lifting Machines, Definition of Mechanical Advantage, Velocity Ratio and Efficiency of Machines and their relation, Reversibility of Machines and condition for self locking machine, Law of Machines, Maximum mechanical advantage and maximum efficiency of machine, Calculation of M.A., V.R., Simple screw jack.

Reference Books: -

1. KL Kumar, Engineering Mechanics, Tata McGraw- Hill Education
2. Ferdinand.P. Beer. E, Russell Johnston Jr., David Mazurek, Philip J Cornwell, "Vector
3. Mechanics for Engineers: Statics and Dynamics" , McGraw - Hill

4. Timoshenko, and Young, “Engineering Mechanics”, Tata Mc-Graw Hill
5. P.N. Chanchandramouli, Engineering Mechanics, PHI Learning Private Limited

List of List of suggestive core experiments: -

1. To obtain resultant of various forces
2. To calculate support reactions through conditions of equilibrium for various structures
3. To understand role of friction in equilibrium problems
4. Determine resultant of concurrent force system applying Law of Polygon of forces using force
   table.
5. Determine resultant of concurrent force system graphically.
6. Verify Lami’s theorem.
7. Study forces in various members of Jib crane.
8. Determine support reactions for simply supported beam

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Environmental Science (205)/(DIP-205)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO-1	Understand the ecosystem and terminology and solve various engineering problems applying ecosystem knowledge to produce eco – friendly products
CO-2	Understand the suitable air, extent of noise pollution, and control measures and acts
CO-3	Understand the water and soil pollution, and control measures and acts.
CO-4	Understand different renewable energy resources and efficient process of harvesting.
CO-5	Understand different energy resources.

Unit-1 ECOSYSTEM: Structure of ecosystem, Biotic & Abiotic components Food chain and food web Aquatic (Lentic and Lotic) and terrestrial ecosystem Carbon, Nitrogen, Sulphur, Phosphorus cycle. Global warming -Causes, effects, process, Green House Effect, Ozone depletion.

Unit– 2 AIR AND, NOISE POLLUTION: Definition of pollution and pollutant, Natural and manmade sources of air pollution (Refriger- ants,I.C., Boiler) Air Pollutants: Types, Particulate Pollutants: Effects and control (Bag filter, Cyclone separator, Electrostatic Precipitator) Gaseous Pollution Control: Absorber, Catalytic Converter, Effects of air pollution due to Refrigerants, I.C. Noise pollution: sources of pollution, measurement of pollution level, Effects of Noise pollution, Noise pollution (Regulation and Control) Rules, 2000

Unit- 3 WATER AND SOIL POLLUTION : Sources of water pollution, Types of water pollutants, Characteristics of water pollutants Turbidity, pH, total suspended solids, total solids BOD and COD Definition, calculation Waste Water Treatment: Primary methods: sedimentation, froth floatation, Secondary meth- ods: Activated sludge treatment, Trickling filter, Bioreactor, Tertiary Method: Membrane separation\ technology, RO (reverse osmosis). Causes, Effects and Preventive measures of Soil Pollution: Causes-Excessive use of Fertilizers, Pesticides and Insecticides, Irrigation, E-Waste.

UNIT– 4 SOLAR ENERGY: Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air). Theory of flat plate col-lector.Importance of coating. Advanced collector. Solar pond. Solar water heater, solar dryer.Solar stills. Biomass: Overview of biomass as energy source.

Unit-5 BIOMASS AND WIND ENERGY& NEW ENERGY: Thermal characteristics of biomass as fuel. Anaerobic digestion. Biogas production mechanism. Utilization and storage of biogas. Wind energy: Current status and future prospects of wind energy. Wind energy in India. Environmental benefits and problem of wind energy. New Energy Sources: Need of new sources. Different types new energy sources. Applications of (Hydrogen energy, Ocean energy resources, Tidal energy conversion.)

Reference Books: -

1. S.C. Sharma & M.P. Poonia, Environmental Studies, Khanna Publishing House, NewDelhi
2. C.N. R. Rao, Understanding Chemistry, Universities Press (India) Pvt. Ltd., 2011.
3. Arceivala, Soli Asolekar, Shyam, Waste Water Treatment for Pollution Control and
4. Reuse, Mc-Graw Hill Education India Pvt. Ltd., New York, 2007, ISBN:978-07-062099-
5. Nazaroff, William, Cohen, Lisa, Environmental Engineering Science, Willy, New York, 2000,ISBN10: 0471144940.
6. 6. O.P. Gupta, Elements of Environmental Pollution Control, Khanna Publishing House, New Delhi

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Computer Workshop (206)/(DIP-206)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO-1	Understand the basic concept and structure of computer hardware and networking.
CO-2	Identify the existing configuration of the computers and peripherals.
CO-3	Apply their knowledge about computer peripherals to identify / rectify problems onboard.
CO-4	Integrate the PCs into local area network and re-install operating system and various application programs.
CO-5	Manage data backup and restore operations on computer and update application software.

Reference Books: -

1. Programming in C Balagurusamy ,Tata Mc-Graw hill Publishing Company Ltd., New Delhi, IIndEdition 2000.
2. The Complete Reference 'C' Herbert Schildt,4 edition, McGraw-Hill Osborne Media;
3. Let us Learn 'C' Yashwant Kanetkar ,BPB Publications, B-14, Connaught Place, New Delhi, IIIrd Edition,2000.
4. The Spirit of C, Mullish Cooper, Jaico Publishing House, 121, N.G. Road, Mumbai,.
5. Exploring C, Yashwant Kanetkar ,BPB Publications, B-14, Connaught Place New Delhi.
6. The C Programming Language Kernighan, Brian W.; Dennis M.Ritchie, Prentice Hall

List of suggestive core experiments: -

1. Demonstration of computer Hardware Components in Lab.
2. How to Assemble hardware like RAM, HDD etc. assemble in computer.
3. Assignment to prepare general algorithms and flow chart.
4. Study of turbo C editor -file menu, edit menu, run menu, compile menu etc.
5. Assignment to write character, operator set of C Language.
6. Assignment to identify valid and invalid variables, constants, and expressions.
7. Program based on Input/Output statements.
8. Programs based on Arithmetic expression.
9. Programs based on goto statement.
10. Programs based on `if' and `Nested if".
11. A Program based on `switch case' statement.
12. At least one program based on each:
    I. `for' statement.
    II. `while' statement.

III. `do-while' statement.

IV. break continue statement.

13. Program based on pointer expression.

14. Program based on pointer arithmetic.

15. Program based on pointer to pointer.

16. Program based on array of pointer.

17. Program based on dynamic memory management functions.

18. Program based on two-dimensional array.

19. Program based on Library functions.

20. Programs based on string operations.

21. Programs based on functions.

22. Program based on pointer to function.

23. Program based on Parameter passing mechanisms.

24. Programs based on recursion.

25. Program based on macros.

26. Program based on storage classes.

27. Program based on structure, union and enumeration.

28. Program based on command line argument

29. Programs based on files.

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Engineering Graphics (207)/(DIP-207)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO-1	To understand the language of graphics which is used to express ideas, convey instructions while carrying out engineering jobs.
CO-2	To develop drafting and sketching skills, to know the applications of drawing equipments, and get familiarize with Indian Standards related to engineering drawings
CO-3	To develop skills to visualize actual object or a part of it, on the basis of drawings.
CO-4	To develop skills to translate ideas into sketches and to draw and read various engineering curves, projections and dimensioning styles.
CO-5	To understand the basic commands and develop basic skills related to computer aided drafting, of how to draw, modify, and edit basic shapes (2D), using AUTOCAD

UNIT I INTRODUCTION TO ENGINEERING DRAWING: Principles of Engineering Graphics and their significance, usage of drawing instruments, lettering

UNIT II ORTHOGRAPHIC PROJECTIONS: Orthographic Projections covering, Principles of Orthographic Projections- Conventions -Projections of Points and lines line parallels to both the planes and perpendicular to H.P. and V.P. Projections of plane perpendicular to H.P. and plane parallel to V.P., perpendicular to V.P. plane and parallel to H.P.

UNIT III –PROJECTIONS OF SOLIDS: the axis of the cylinder perpendicular to hp and parallel to V.P. the axis of the cone perpendicular to hp and parallel to V.P., the axis of the Pyramid perpendicular to hp and parallel to V.P., the axis of the prism perpendicular to hp and parallel to V.P.

UNIT IV ISOMETRIC PROJECTIONS: Isometric Projections covering, Principles of Isometric projection Isometric Scale, Isometric Views, Conventions; Isometric Views of lines

UNIT V COMPUTER AIDED DRAFTING: Draw basic entities like Line, Circle, Arc, Polygon, Ellipse, Rectangle, Multiline, PolyLine. Method of Specifying points: Absolute coordinates, Relative Cartesian and Polar coordinates. Modify and edit commands like trim, extend, delete, copy, offset, array, block, layers. Dimensioning: Linear, Horizontal Vertical, Aligned, Rotated, Baseline, Continuous, Diameter, Radius, Angular Dimensions.

Reference Books:

1. Bureau of Indian Standards. Engineering Drawing Practice for Schools and Colleges IS: Sp-46. BIS. Government of India, Third Reprint, October 1998; ISBN: 81-7061-091-2.
2. Bhatt, N. D. Engineering Drawing. Charotar Publishing House, Anand, Gujrat 2010; ISBN: 978-93- 80358-17-8.
3. Jain & Gautam, Engineering Graphics & Design, Khanna Publishing House, New Delhi (ISBN: 978- 93-86173-478)
4. Jolhe, D. A. Engineering Drawing. Tata McGraw Hill Edu. New Delhi, 2010; ISBN: 978-0-07- 064837-1
5. Dhawan, R. K. Engineering Drawing. S. Chand and Company, New Delhi; ISBN: 81-219-1431-0.

List of suggestive core experiments:

1. Drawing Work on Engg. Scales.
2. Drawing Work on Projection of Points & Straight Lines
3. Drawing Work on Projection of Planes
4. Drawing Work on Projection of Solids.
5. Drawing Work on Isometric Projection.
6. Drafting work using CAD.

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Disaster Management-II (208)/(DIP-208)

After Completing the course student should be able to:

Understand the need and significance of studying disaster management Explain disaster management basics and theory (cycle,phases,risk,crisis,emergency,disasters,resilience)