3.1 CROP PRODUCTION

L	P
5	2

RATIONALE

A diploma holder in Agricultural Technology needs to learn about package of practices for various seasonal crops besides becoming familiar with the preparation of cost estimates for production of these crops. After studying the subject of crop production, the diploma holders should acquire adequate knowledge and skills of crop production and cropping system, soil fertility and weed management besides plant protection and crop harvesting. Hence this subject.

DETAILED CONTENTS

1. Introduction (15 hrs)

   Agriculture, importance of agriculture, Crop production Art, Science and business, Factors affecting crop production viz. Internal and external factors. Classification of crops based on their utility and seasons of growing. Major and principal crops of the country and Haryana state. Introduction to major fruits, vegetables and flower crops of country with specific emphasis on the crops of state of Haryana. Introduction to various specialization of agriculture.

2. Crop Rotation and Cropping System (10 hrs)

   Crop rotation, Principles of crop rotation, advantages of crop rotation and rotational intensity. Cropping scheme and principles of cropping scheme. Cropping intensity. Systems of cropping viz. mixed cropping and intensive cropping. Principles of mixed cropping and its advantages. Pre-requisites of intensive cropping and methods of intensive cropping viz. multiple & intercropping. Crop diversification.

3. Seed Bed Preparation (6 hrs)

   Tillage, definition, function and importance of tillage. Types and methods of tillage. Effect of tillage on the soil characteristics and nutrient availability in soil. Selection of tillage methods.

4. Sowing / Placement of Seeds (6 hrs)

   Characteristics of good seed, types of seeds viz. Breeder's, Nucleus, and Foundation and Certified seeds. Seed treatment. Factors affecting seed germination. Different methods of seed placement in the soil and selection criteria of methods. Time of sowing.

5. Irrigation and Water Application (6 hrs)

Importance of water for plants, necessity of water application. Critical stages (growth) of water application .Sources of irrigation water. Methods of irrigation (names only). Factors affecting selection of method viz. crop , soil , source of water .

6. Interculture and Weed Management (6 hrs)

Importance of intercultural operations in crop productions . Introduction with the methods, tools and equipment required for interculture. Weed , its characteristics, classification, useful and harmful effects. Medium of weed seed dispersal. Methods of weed control viz. mechanical, biological, agronomical (crop competition and rotation), firing and chemical.

7. Soil Fertility Management (7 hrs)

Plant nutrient elements, their classification viz. Macro, Secondary & Micro and their importance. Soil fertility, Types of Fertilizers and Manners used to maintain soil fertility. Methods of application, tips for safe storage and better handling of fertilizers. Amount and time/stages of fertilizer application, organic fertilizers and their advantage.

8. Plant Protection (6 hrs)

Various factors/agents causing damage to the crop viz. Pests, Diseases etc. Introduction with the ecofriendly pest- management practices and the chemicals used for control of diseases, bio-pesticides.

9. Harvesting (4 hrs)

Various methods of harvesting of different crops. Factors affecting harvesting viz. time of maturity, moisture contents, climates factors etc.

10. Practices/Cultivation Details/Modern Techniques (10 hrs)

Package of practices/cultivation details/important modern techniques for raising following crops: -

Wheat, Paddy, Maize, Bajra, Gram, Mustard, Groundnut, Cotton, Sugarcane and Potato grown in Haryana.

11. Horticultural Terminology (4 hrs)

Introduction to special operations for raising/growing horticultural crops such as grafting, pruning, shearing, pinching, girdling etc.

LIST OF PRACTICALS

1. Identification of crops and their seeds.
2. Identification of different types of fertilizers.
3. Identification of different crop weeds and methods of weed control.
4. Practices of fertilizer application.
5. Methods of seed bed preparation.
6. Methods of sowing/planting.
7. Visits to the mechanized/modernized farms of agricultural universities/center-state farms for the study of growth phases in various crops and to get the exposure of modern techniques being used for raising different crops.
8. Study of Vermicomposting and visits to agriculture farms.
9. Estimation of different entities required for crop production and estimation of yield of crops.
10. Identification of different diseases and insect-pests of major field crops.

INSTRUCTIONAL STRAGEGY

Students to be taken to agricultural farms for demonstration of various operations and use of charts and video films be made during teaching-learning process.

RECOMMENDED BOOKS

1. A text book of Soil Engineering; New India Publishing House Delhi.
2. Cropping System Theory & Practice by Chatterjee; Oxford & IBH Publication Co.
3. Crop Production &Management by Y.B. Morachan; Oxford & IBH Publication Co.
4. Principles & Practices of Agronomy by S.S. Singh; Kalyani Publishers, New Delhi.
5. Manual of Irrigation Agronomy by Mishra and Ahmad Mall; Oxford & IBH Publication CO.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	15	18
2	10	12
3	6	8
4	6	8
5	6	8
6	6	8
7	7	8
8	6	8
9	4	5
10	10	12
11	4	5
Total	**80**	**100**

3.2 FARM IRRIGATION ENGINEERING

L	P
4	3

RATIONALE

A diploma holder in agricultural technology needs to learn the principles pertaining to the optimum use of water for maximum agricultural yield besides understanding engineering principles related to surface and ground water resources. After studying this subject, the students shall acquire adequate knowledge and skills about water requirement of crops and water lifting devices.

DETAILED CONTENTS

1. Introduction (4 hrs)

Sources of surface water resources, irrigation, necessity of irrigation and advantages and disadvantages of irrigation. Types of irrigation viz. artificial (flow, lift etc.) and natural. Sources and quality of irrigation water.

2. Irrigation Water Requirement and Efficiencies (10 hrs)

2.1 Evaporation, pan evaporimeter. Transpiration, evapotranspiration or consumptive use, seasonal consumptive use, peak period consumptive use. Estimation of evapotranspiration from evaporation data and climatological data(introduction only).

2.2 Water infiltration and infiltration rate. Crop water requirement, net and gross irrigation requirement. Irrigation frequency, estimation and irrigation scheduling.

2.3 Duty and Delta; factors affecting duty and methods of improving duty.

2.4 Irrigation efficiencies- water conveyance, application, storage, distribution, water use, project, operational and economic efficiency.

3. Water Application Methods (18 hrs)

3.1 Introduction to surface, subsurface, sprinkler and drip irrigation systems.

3.2 Surface methods of irrigation viz. border, check basin and furrow irrigation, their basic details, characteristics, types and their adaptability.

3.3 Sprinkler irrigation-its adaptability and limitations, types ,components, operation and maintenance of sprinkler systems. Layout and various design parameters of sprinkler irrigation system.

3.4 Drip irrigation- its adaptability and limitations, types, components, operation and maintenance of drip irrigation systems. Layout and various design parameters of drip irrigation system.

4. Water Lifting Devices (10 hrs)

4.1 Introduction to various power operated, water lifting devices.

4.2 Classification of pumps-positive displacement (reciprocating and rotary), variable displacement.

4.3 Pumps and Terminology, Centrifugal pumps (volute and diffuser type, single stage and multistage type), Types of impellers of centrifugal pump. Installation, operation and maintenance of centrifugal pumps.

4.4 Submersible pump and vertical turbine pumps; their common troubles and remedies.

4.5 Criteria and procedures for selection of irrigation pumps, power requirements and efficiency

5. Well Hydraulics, Open Wells and Tube Wells (10 hrs)

5.1 Types of water bearing formations (confined, unconfined aquifer etc.) aquifer characteristics influencing yield of wells. Determination of aquifer constant, specific capacity of wells.

5.2 Different terms related to well hydraulic such as water tables, isobath, isobar lines , draw down. Recharge of ground water.

5.3 Types of wells, open wells, their design parameters and construction of an open well, tube wells.

6. Conveyance and Measurement of irrigation water (10 hrs)

6.1 Canals and their classification (brief description only), seepage from canals and field channels. Canal lining-various types. Their advantages and disadvantages.

6.2 Introduction to various water conveyance structures and their functions. Open channels, their types, layout and design parameters.

6.3 Subsurface systems of water conveyance, their components.

6.4 Units of water measurement, direct and indirect methods of water measurement. Measurement of water in pipes and open channels.

7. Environment Issues (2 hrs)

Pollution with poor quality irrigation water and excessive use of fertilizer and agro-chemicals.

INSTRUCTIONAL STRETAGY

- Irrigation area from state Govt. departments like Agriculture, Irrigation and Public Health, Tubewell Corporation etc. may be consulted.
- Water Conveyance Structures need to be studied in the agriculture farm.
- Pressurized Irrigation system installed in the farm/industry for problems and constraints.

LIST OF PRACTICALS

1. Installation, operation and maintenance of sprinkler irrigation system.
2. Installation and operation of centrifugal pump.
3. Dismantling of centrifugal pump, study of constructional feature of its component and its assembly.
4. Installation, operation & maintenance of submersible pump. Identifying/locating the faults/troubles and remedies.
5. Measurement of water flow in the open field channels.
6. To survey market and field for the availability, adaptability and selection of various types of pumps and irrigation systems in the region.
7. Study tours to irrigation equipment industries: pumps, sprinkler and drip etc.

RECOMMENDED BOOKS

1. Ground Water and Well Drilling by Parveen Kumar; CBS Publishers and Distributors, Delhi
2. Sprinkler Irrigation by Sivanappan; Oxford & IBH Publication Co.
3. Irrigation Engineering by M. Lal & Etal; New India Publishing House.
4. Water use Efficiency in Agriculture by Giriappa; Oxford & IBH Publication Co.
5. Irrigation Practice &Water Management by FAO; Oxford & IBH Publication Co.
6. Irrigation Engineering by Sharma & Bari; Satya Parkashan Publishers.
7. Irrigation Engineering by B.L. Gupta; Satya Parkashan Publishers.
8. Irrigation Engineering (Vol. 1,2,3) by Sharma &Sharma; Oxford & IBH Publication Co..

9. Water well & Pump Engineering by A.M. Michael & S.P.Khepar; Tata McGraw Hill Publishing Co. Ltd., New Delhi.
10. Text Book of Irrigation Engineering (Vol. 2,3) by Sharma & Sharma; Oxford & IBH Publication Co.
11. Irrigation Theory and Practice by Dr. A.M. Michael; Vikas Publishing House, New Delhi.
12. Theory and Practice byA M Michael; Vikas Publishing House, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	4	5
2	10	15
3	18	30
4	10	15
5	10	15
6	10	15
7	2	5
Total	**64**	**100**

3.3 SOIL AND WATER CONSERVATION

L	P
4	-

RATIONALE

A diploma holder in Agricultural Technology needs to learn about the soil erosion, the factors affecting the erosion besides the soil erosion control practices and drainage. A course on soil conservation shall equip the students with the knowledge of the properties of soil, agents of erosion, methods of erosion control, water harvesting and drainage problems. Hence this subject.

DETAILED CONTENTS

1. Soil and its properties (2 hrs)

   Introduction to the soil as a natural body, definitions and functions of soil. Various constituents of soil and their importance. Soil as a medium of plant growth.

2. Properties of Soil in relation to plant growth (8 hrs)

   2.1 Soil separates and classifications (I. S. S. S. & U. S. D. A.). Soil texture and classification of soil (U. S. D. A.).

   2.2 Soil structure; definition, types and factors affecting soil structure. Bulk density and particle density of soils. Soil consistency. Porosity & void ratio. Degree of saturation.

   2.3 Soil moisture content (dry basis & wet basis). Method of soil moisture determination viz. gravimetric method. Retention of soil moisture; maximum retentive capacity, field capacity, permanent wilting percentage, hygroscopic coefficient. Soil moisture classifications. Available water holding capacity of soil. Soil permeability; definition and importance.

   2.4 Darcy‘s law, Coefficient of permeability. Soil air and aeration.

3. Soil Erosion (6 hrs)

   3.1 Introduction, Classification of erosion viz. Geological and accelerated.

   3.2 Mechanics of Water Erosion: Raindrop erosion, Sheet erosion, Rill erosion, Gully erosion and principle of gully erosion and Classification of gullies. Stream channel erosion. Effects of water erosion, Factors affecting erosion by water.

   3.3 Mechanics of Wind Erosion: Processes of saltation, suspension, surface creep. Factors affecting erosion by wind.

4. Erosion Control Measures (16 hrs)

4.1. Principles of erosion control

4.2. Agronomical measures: Agronomic and field practices to control erosion by wind and water i.e. Contour farming, strip cropping, tillage etc.

4.3. Mechanical measures: Terracing to control erosion by water. Types of terraces. Terrace design parameters and planning a terrace system. Bench terraces, types and design parameters.

4.4. Use of bunds to control erosion and design parameters of bunds. Contour bunding. Vegetated water ways for the control of erosion.

4.5. Temporary structures for the control of gully erosion, their types and adaptability.

4.6. Permanent soil conservation structures viz. Drop spillway, Chute spillway, Drop inlet spillway for the control of erosion; their principles, adaptability, constructional features and material of construction. Introduction to the farm ponds, earthen embankments and water harvesting in relation to soil and water conservation, soil conservation through tree and grass cultivation, ground water recharge, watershed management

5. Water Harvesting and Storage (6 hrs)

Need, Importance and scope of water harvesting, Types and Methods of water harvesting. Brief description of the different systems of water harvesting and storage.

6. Salt affected soils and their reclamation (6 hrs)

6.1 Saline, alkaline and acid soils, Reasons and factors of their formation.

6.2 Chemical Properties: Soil reaction (pH), Electrical Conductivity (EC), Cation Exchange Capacity (CEC), Sodium Adsorption Ratio (SAR), Exchangeable Sodium Percentage (ESP), salt concentration in the soils. Effect of salinity, alkalinity and acidity on plant growth. Reclamation of these soils and their management.

7. Waterlogged soils and their drainage (18 hrs)

7.1 Water logging, causes of water logging and its effects. Drainage. Types of drainage systems viz. surface and subsurface drainage. Introduction to drainage investigation. Benefits of drainage. Drainage properties of soil. Drainage coefficient.

7.2 Surface drainage-functional components, types (random drain, parallel field drain, parallel open ditch and bedding system used in flat areas and cross slope ditch system used in sloping areas).

7.3 Benefits of subsurface drainage. Introduction to investigations for subsurface drainage, different method of subsurface drainage viz. tile drains, mole drains, drainage wells, deep open drains and combination of tile and opened drains.

8. Environment Issues: (2 hrs)

Waterlogged soils are health hazard, salt affected soils create impermeability and long term effects

INSTRUCTIONAL STRAGEGY

1. Works on soil conservation project of state government need to be shown.
2. Sub surface drainage of CSSRI, Karnal for practical exposure.
3. Water harvesting ponds/structures in the field/university for field exposure.

RECOMMENDED BOOKS

1. Soil & Water Conservation Engineering by Glenni O.Schwab, Richard K. Frevert, Talcott W. Edminster, Kenneth K.Barnes; John Wiley & Sons New York
2. Manual of Soil & Water Conservation Practice by Gurmail Singh; Oxford & IBH Publication co.
3. Soil & Water Conservation Engineering by Suresh R.; Standard Publication
4. Principle of Agricultural Engineering Volume-II by A.M. Michael & T.P. Ojha; Jain brothers.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	2	4
2	8	12
3	6	10
4	16	25
5	6	10
6	6	10
7	18	25
8	2	4
Total	**64**	**100**

3.4 MANUFACTURING TECHNOLOGY - I

L	T	P
4	-	4

RATIONALE

The knowledge of manufacturing techniques in the area of foundry, machine shop (fitting shop, lathe machines and shaping), inspection and gauging and in coating both on metallic and non-metallic is essential at the first stage for understanding technology. Hence the following topics are included.

DETAILED CONTENTS

NOTE:

a) Teachers will introduce various tools with their specific function to be used in various manufacturing processes

b) Teachers will acquaint the students with safety measures to be taken while using manufacturing processes and tools.

1. Fitting (10 hrs)

Fits, limits and tolerances and their applications, unilateral and bilateral tolelances, gauges, gauge tolerances, micrometer, vernier, height gauges, dial comparator, straight edge, surface plate. Metal cutting, metal shear, metal sawing, metal bending. Types of pipes, their materials and pipe standards. Types of pipe fittings and applications, pipe threads and thread cuttings.

2. Metallic and Non-metallic Coatings (8 hrs)

Necessity of metallic and non-metallic coatings, principles and processes of electroplating, galvanizing, vacuumizing, metal spraying, painting and their applications, preparation of base materials. Uses of primers, paints and finish coatings, powder coating and its advantages.

3. Foundry (12 hrs)

Introduction, types of patterns, pattern materials, cores and core boxes, core materials, preservation and storage of patterns,. Introduction to moulding, types of moulding sands, types of moulds, preparation of cores, defects in moulds and their remedies, types of melting furnaces (pit furnace, tilting furnace, cupola, oil fired and induction furnaces), casting defects and their remedies.

4. Lathes (14 hrs)

Introduction, types of lathes, specifications, description and functions of lathe parts, feed mechanism, drives and transmission, work holding devices, turning tools

Lathe operations – plain turning, facing, centring, parting off, undercutting, taper turning, eccentric turning, drilling, reaming, thread cutting and knuling, speeds and feeds of cut.

Introduction to capstan and turret lathes, copying lathe and their attachments, difference between capstan and turret lathes and heads, tool holders and tool layout, tool geometry and use of throwaway tips, brazed tools and HSS tools.

5. Shapers – their functions (8 hrs)

Operation and mechanism

6. Inspection Instruments and Gauges (12 hrs)

Height gauge, depth gauge, bore gauge, slip gauge, sine bar, measurement of taper by use of slip gauges, limits, fits and tolerances, interchangeability, Go and Not-Go gauges, screw thread micrometer, thread gauge, radius gauge, dial gauge, and gear tooth vernier, hardness checking instruments, coating thickness checking instruments, surface finish checking instruments, Tallyrand with computerized display of readings.

INSTRUCTIONAL STRATEGY

The teacher must show the models, tools and gauges as instructional materials for the effective teaching-learning process.

LIST OF PRACTICALS

1. Fitting shop

Bench work and fittings; simple male-female fitting (fitting of pulley, bearings, gears on shafts), scraping, pipe fittings with leakproof joints, checking alignment and centre distance

2. Pattern making and foundry shop

- To prepare pattern of rectangular block, ‘V’ block, step pulley with core box, split pattern
- Preparation of open floor mould of solid pattern, cope drag mould using split pattern
- Visit to foundry to see castings of cast iron, steel, non-ferrous materials, hand moulding, machine moulding and melting furnaces. Induction heating and gas fixed furnaces

3. Lathes

- Introduction to turning machine and allied services like cutting tool grinding, general shop layout including maintenance, oils, tools and gauge stores.
- Different exercises in turning like plain turning, step-turning, facing, chamfering, knurling, parting off and thread cutting, use of compound slide and tailstock, tool grinding, selection of coolant and lubricants and speed and feeds. Use of safety goggles.

RECOMMENDED BOOKS

1. Workshop Technology by BS Raghuwanshi, Dhanpat Rai & Sons, Delhi
2. Manufacturing Technology by M Adithan and Gupta, New Age International (P) Ltd., Delhi
3. Elements of Workshop Technology by SK Choudhary & Hazara, Asia Publishing House
4. Principles of Foundry Technology by Jain, Tata McGrawHill, New Delhi
5. Workshop Technology, Vol-I, II & III by Chapman, Standard Publishers Distributors, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	10	15
2	8	10
3	12	20
4	14	20
5	8	15
6	12	20
Total	**64**	**100**

3.5 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

L	T	P
3	-	2

RATIONALE

The objective of this subject is to impart fundamental knowledge and skills regarding basic electrical and electronics engineering, which diploma holders will come across in their professional life. This course will provide the students to understand the basic concepts and principles of d.c. and a.c. fundamentals, electromagnetic induction, transformers, motors distribution system, domestic installation, electrical safety etc. The students will also learn basic electronics including diodes and transistors and their applications.

DETAILED CONTENTS

1. Application and Advantage of Electricity (04 hrs)

   Difference between ac and dc, various applications of electricity, advantages of electrical energy over other types of energy

2. Basic Electrical Quantities (04 hrs)

   Definition of voltage, current, power and energy with their units, name of instruments used for measuring above quantities

3. Electromagnetic Induction (046 hrs)

   Production of e.m.f., idea of a transformer and its working principle

4. Transmission and Distribution System (08 hrs)

   Key diagram of 3 phase transmission and distribution system, Brief functions of accessories of transmission line. Difference between high and low voltage distribution system, identification of three-phase wires, neutral wire and earth wire in a low voltage distribution system. Identification of voltages between phases and between one phase and neutral. Difference between three-phase and single-phase supply. Arrangement of supply system from pole to the distribution board, function of service line, energy meter, main switch, distribution board

5. Domestic Installation (08 hrs)

   Various types of domestic circuits, various accessories and parts of domestic electrical installation. Identification of wiring systems, staircase installation

6. Electric Motors and Pumps (10 hrs)

Definition and various applications of single-phase and three-phase motors. Connection and starting of three-phase induction motors by star-delta starter. Conversion of horse power in watts or kilowatts, Type of pumps and their applications, difference between direct online starter and star delta starter, characteristics and applications of servo motors.

7. Electrical Safety (04 hrs)

Electrical shock and precautions against shock, treatment of electric shock, concept of fuses and their classification, selection and application, concept of earthing and various types of earthing, applications of MCBs and ELCBs

8. Basic Electronics (06 hrs)

Basic idea of semiconductors – P and N type; diodes, zener diodes and their applications, transistor – PNP and NPN, symbols, identification of terminals of transistor, current flowing in a transistor, its characteristics and uses. Characteristics and applications of a thyristor

LIST OF PRACTICALS

1. Connection of a three-phase motor and starter with fuses and reversing of direction of rotation
2. Connection of a single-phase induction motor with supply and reversing of its direction of rotation
3. To test a battery for its charged and discharged condition.
4. Identify the different faults in a domestic wiring system
5. Connection and reading of an electric energy meter with supply and load using ammeter, voltmeter, wattmeter
6. Study of a distribution board for domestic installation
7. Ohm’s law verification
8. Verification of law of resistance in series
9. Verification of law of resistance in parallel
10. Draw V-I characteristics of P-N junction diode
11. Draw input and output characters of a transistor
12. Draw reverse break down characteristics of a zener diode

INSTRUCTIONAL STRATEGY

The teacher should give emphasis on understanding of concept and various terms used in the subject. Practical exercises will reinforce various concepts.

RECOMMENDED BOOKS

1. Basic Electrical Engineering by PS Dhogal; Tata McGraw Hill Publishers, New Delhi
2. A Text Book of Electrical Technology, Vol. I and II by BL Thareja; S Chand and Co., New Delhi
3. Basic Electricity by BR Sharma; Satya Prakashan, New Delhi
4. Basic Electrical Engineering by JB Gupta, S Kataria and Sons, Delhi
5. Experiments in Basic Electrical Engineering by SK Bhattacharya and KM Rastogi, New Age International Publishers Ltd., New Delhi
6. Basic Electronics by VK Mehta; S Chand and Co., New Delhi
7. Electrical Machines by SK Bhattacharya; Tata McGraw Hill, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	04	10
2	04	10
3	04	08
4	08	16
5	08	16
6	10	20
7	04	08
8	06	12
Total	**64**	**100**

3.6 COMPUTER APPLICATIONS IN AGRICULTURE ENGINEERING

L	T	P
-	-	4

RATIONALE

Today age is computer age. Most of our daily activities are being influenced by the use of computers. While in areas like science and technology, improvements cannot be achieved without computers. It has become necessary for each and everyone of us to have a basic knowledge of application of computers. PowerPoint is a feature packed presentation programme whereas access is database management systems. Programming is backbone for preparing various technological projects, which can be achieved by C^{++} language – most versatile one in today's scenario. This subject is being offered to acquaint the students about MS PowerPoint, MS Access and Programming using C^{++} language.

DETAILED CONTENT

1. Computer Application Overview (3 hrs)
   - Commercial and business data processing applications
   - Engineering computation

2. MS PowerPoint (10 hrs)

   2.1 Introduction

   - Elements of power point package- templates, wizards, views, color schemes
   - Starting PowerPoint
   - Exploring PowerPoint menus
   - Starting a new slide
   - Adding title, text and art
   - Moving text area and resizing text box
   - Starting a slide show
   - Saving a presentation
   - Printing slides
   - Inserting and deleting slides
   - Closing a presentation
   - Exercise for making a presentation and slide show

   2.2 Views

   - PowerPoint views – slide view, outline view, slide sorter view, notes view, slide show view, slide setup
   - Zoom in, zoom out
   - Exercises on various views of presentation

2.3 Formatting and Enhancing text

- Formatting
- Changing format with a new layout
- Alignment of text and text spacing
- Enhancing text formatting – use of bullets, changing text font and size
- Selecting text style and color
- Applying design template
- Closing and applying the transition
- Spell checking
- To set header and footer
- Exercise on formatting text and applying design template.

2.4 Slide with graphs

- Creating a graph
- Adding graphic objects
- Adding clipart pictures
- Adding movies and sounds
- Adding multimedia to presentation
- Inserting excel worksheet or word table
- Exercise on inserting graphs, tables, movies and clipart.

3. MS – Access (16 hrs)

3.1 Introduction to Microsoft access

- Components of access

3.2 Table creating

- Starting access, creating tables, tool bars and views of tables
- Editing the design and contents of the table
- Creating relationship between tables
- Adding OLE objects to a table
- Use of import and export facility
- Exercise on table creating

3.3 Query Handling

- Creating a new query, use of criteria, expressions and operation
- Editing a query, print a query
- Exercise on creating and editing query

3.4 Form designing

- Introduction, creating a form, modify a form design, designing a form using design view.
- Sub – forms, printing the forms, exercise on form designing.

3.5 Report designing

- Creating a report, managing the different controls of the records, saving and printing the report, use of graphs in reports
- Exercise on report designing

4. Programming fundamentals (6 hrs)

- Algorithm, pseudo language, flow charts: advantages and disadvantages
- Decision table – type, advantages and disadvantages
- Structured programming: structuring the control flow, modular programming
- Exercise on making algorithm and flow charts.

5 C^{++} programming (24 hrs)

5.1 Fundamentals

- Introduction, oop, character set, C^{++} tokens, keywords, identifiers, constants, basic data type, declaration of variables, defining symbolic constants, assignment statement, comments in a programme, structure of C^{++} programme, output using COUT, output using CIN, manipulators.

5.2 Operators and Expressions

- Arithmetic operators, relational operators, logical operators, shorthand assignment operator, increment and decrement operators, conditional operators, bit wise operators, precedence in C^{++} operators, casting of data, standard mathematical functions.

5.3 Control structures

- IF statements, IF---ELSE statements, nested IF statements, switch statements, Go To statements, repetitive structures, while statements, do statement, for loop, break statement, continue statement, nested loops.

5.4 Programs

- Write a program to check if a number is even or odd.
- Write a program to find the smallest of 3 numbers.
- Write a program to find largest of 4 numbers
- Write a program to find the roots of quadratic equation.
- Write a program to find the sum of the first N natural numbers using a for - do loops.

- Write a program that reads in N numbers and finds the smallest number among them.
- Write a program to find the sum of squares of the digits of a number.

6. Internet

   Browsing and down loading of information from internet. Use of utilities/software tools related with Agriculture and Agriculture Engineering.

RECOMMENDED BOOKS

1. MS Office 2000 for everyone by Sanjay Saxena; Vikas Publishing House Pvt. Ltd.
2. MS Office 2000 by Steve Hill; BPB Publications.
3. Computer Fundamentals by P K Sinha; BPE Publication, New Delhi
4. Internet for Everyone by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd. Jungpura, New Delhi.