GURUKUL EDUCATIONAL AND RESEARCH INSTITUTE

DIPLOMA IN AGRICULTURE

Subject and Syllabus

2022-23

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Syllabus

DIPLOMA IN AGRICULTURE

DURATION:- 2 YEARS

(Semester I)

809 AGRICULTURAL HERITAGE OF INDIA

Unit I

Development of human culture and beginning of agriculture .Indus civilization (3250 BC - 2750 BC).Status of farmers in the society during Indus, Vedic, Buddhist, Mauryan, Gupta and Sangam periods. Kautilya's artha-sastra- agriculture, animal husbandry, commodity trade etc., features of village. Astronomy - Prediction of Monsoon Rains; Parashara, Varamihira, Panchanga in comparison to modern methods.

Unit II

Ancient soil classification and maintenance of soil productivity.Water harvesting and irrigation developments during different periods,water storage – distribution and relevance to modern agriculture. Plant protection in ancient period, ITK, harvesting, threshing and storage.

Unit III

Crops: indigenous and introduced. History of rice, sugarcane, cotton, mango, cashew, coconut and areca nut.Gardening in ancient and medieval period, arbori horticulture, orchards.Traditional technical knowledge, vegetable farming, floriculture, perfumes and medicinal plants. Role of cattle and other domestic animals, management of cattle for draught and milk, indigenous breeds.

Unit IV

Journey of agriculture in Goa, features of Goan agriculture- Shifting cultivation, kulaghar, bhat, khajan cultivation, rainfed agriculture, water storage and conservation practices. Animal rearing, pasture lands. Agro-processing, marketing. Cultural aspects and festivals in relation to agriculture. Vision for the future.

810 BASIC LABORATORY CONCEPTS

Theory

Unit I

Acquaintance with the laboratory, laboratory rules, disciplines, precautions, maintenance of records in notebook, introduction to common glassware.Introduction to various measures for handling chemicals and Laboratory Safety, laboratory accidents and first aids.

Unit II

Working principle of Bunsen burner and other heating equipments, basic theory related to cleaning and rinsing the apparatus, study of distillation principle, theories related to separation, purification, sedimentation, decantation, filtration, evaporation, digestion, sublimation, pyrolysis, oil extraction.

Unit II

Concepts of volumetric analysis, normality, molarities, stock preparation, standard solution, titration, molecular weight, atomic number, atomic weight, system of modern nomenclature, qualitative analysis.

Practical

Unit I

Handling and Use of burettes, pipettes, measuring cylinders, flasks, beakers, reagents bottle, desiccators, pestle and mortar, water bath, Bunsen burner, tongs.

Unit II

Handling of separator funnel, condensers, micropipettes, washing, drying and sterilization of glassware, Drying of solvents/chemicals.

Unit III

Weighing and preparation and handling of solutions of different strengths and their dilution, Preparation of solutions of acids, Neutralization of acid and bases, demonstration of purification, sedimentation, evaporation, preparation of standard solutions, handling of titration unit by using normality and molarities solutions. Preparation of reagent solutions.

811 FUNDAMENTALS OF HORTICULTURE

Unit I

Introduction to horticulture, meaning, branches of horticulture, Economic importance and classification of horticultural crops and their nutritive value; present status and prospects of crops.

Unit II

Agro-climatic zones of India; Orchards, gardens, nutrition and kitchen gardens.

Unit III

Selection of site for crop cultivation, Planning and layout of orchards, planting systems and planting densities, calculations based on area and spacing.

Unit IV

Principles and methods of pruning and training of fruit crops; types and use of growth regulators in horticulture; water management, weed management and nutrient management, mulching; Harvesting and maturity standards; packaging and storage of horticultural produce.

Practical

- Planting of mango or cashew sapling / graft.
- Selection and planting of coconut seedling.
- Study of layout systems of orchard.
- Layout of kitchen garden.
- Surface irrigation methods.
- Sprinkler and drip irrigation systems.
- Study of inter-cultivation practices – fencing, weeding, fertilizer application.
- Training and pruning in horticultural crops.
- Use of plant growth regulators.
- Maturity and harvesting indices of horticultural crops.

812 INTRODUCTION TO COMPUTER APPLICATION

Unit I

Microsoft Word and its applications (in relation with Agriculture &Food Industry) Font formatting, Paragraph formatting, Inserting images, auto shapes symbols, diagrams, header & footer, References, watermarks and Hyperlinks, Style & Formatting, Mail Merge through word, Excel, Access database, Page setup, Printing a document.

Unit II

MS Excel and its applications (in relation with Agriculture &Food Industry) Making column chart & pie chart and chart formatting, Use of general functions & formula (autosum, using basic arithmetic operators: +,-,*,/), Use of filter & sorting, Cell references, header & footer, age setup, use of page break preview, printing worksheets.

UNIT III

MS Power-Point and its applications (in relation with Agriculture &Food Industry) Creating own design, formatting objects on a slide, Use of Slide Master to control the design & formatting of a presentation, Use of Image, audio, video in the presentation, Slide show setup, slide transition, use of animation, Use of narration in presentation, Print setup & Printing handouts of a presentation.

UNIT IV

Internet & Web Applications (in relation with Agriculture &Food Industry)

UNIT V

Websites,Internet applications, Google Applications (G-mail, Google search, G Drive, Google Docs) and other Email Services, Industry customer approach.

Practicals

- Applications of MS Excel to solve the problems of Agriculture
- Statistical quality control, Sensory evaluation of food, and Chemical kinetics in food
- processing; Use of word processing software for creating reports and presentation;
- Familiarization with the application of computer in Agriculture -Milk plant, Bakery
- Units, Fruit &Vegetable processing Unit; Familiarization with software related to agriculture marketing;
- Ergonomics application in the same;
- Visit to Industry and case study problems on computer.
- Agriculture Botany

Theory

Unit I

Agriculture Botany, meaning, its importance, scope in general and agriculture in particular.

Unit II

Plant parts and their functions, Floral biology: parts and their functions, pollination, fertilization; Types of root system.

Unit III

Plant cell structure and functions

Unit IV

Plant physiology: Introduction, Definition, importance in agriculture. Growth and development- Definition, Determinate and indeterminate growth, measurement of growth, growth analysis, growth characteristics - Definition and mathematical formulae.

Unit V

Crop water relations: physiological importance of water to plants, Transpiration: significance, transpiration in relation to crop productivity, water use efficiency, Photosynthesis: energy synthesis, relationship of photosynthesis and crop productivity. Photorespiration: factors affecting photosynthesis and productivity, photosynthetic efficiency, dry matter partitioning.

Unit VI

Harvest indices of crops; Respiration and its significance, Nutriophysiology: Definition, functions of plant nutrients - deficiency and toxicity symptoms of plant nutrients foliar nutrition-hydroponics.

II Semester

813 IRRIGATION AND WEED MANAGEMENT

814 AGRONOMY OF FIELD CROPS

815 VEGETABLE CULTURE

816 GENERAL AND ECONOMIC ENTOMOLOGY

817 PRINCIPLES OF PLANT PATHOLOGY

818 ENERGY AND ENVIRONMENT

819 FOOD SCIENCE AND NUTRITION

III SEMESTER

820 CROP PRODUCTION

821 COMMERCIAL FLORICULTURE AND ORNAMENTAL GARDENING

822 BREEDING OF FIELD CROPS

823 CROP PESTS AND THEIR MANAGEMENT

824 CROP DISEASES AND THEIR MANAGEMENT

825 COMMERCIAL AGRICULTURE

826 AGRICULTURAL ECONOMICS AND MARKETING

IV SEMESTER

827 DRY FARMING AND AGRO-FORESTRY

828 SPICES PLANTATION AND MEDICINAL PLANT CULTURE

829 SEED PRODUCTION

830 COMMERCIAL AGRICULTURE

831 EXTENSION METHODS AND AUDIO VISUAL AIDS

832 LANGUAGE FOR COMMUNICATION