Course I

Semester III 2+1=3

CEREALS MILLETS AND PULSE CROPS

(Kharif Crops)

Importance, origin, distribution, climate, varieties, improved agronomic practices, manuring and irrigation, plant protection, harvesting and processing of the following crops, under different agro climatic conditions of UP. ï

Unit I

A. Cereal Crops	-	Paddy, Maize
B. Millet crops	-	Sorghum. Pearl millet

Unit II

C. Oilseed crops	-	Ground nut, Til, Caster
D. Pulse crops	-	Pigeon Pea, Urdbean, Moongbean, Soybean, Cowpea.

Unit III

E. Fibre Crops	-	Cotton, Jute, Sunhemp, Mesta
F. Green Manure Crops	-	Sun hemp and Dhaincha

Unit IV

C. Fodder Crops	-	Sorghum, Pearimillet, Maize, Npier. Sudan grass, Cluster bean, Cowpea
H. Cash Crops	-	Sugarcane, Tobacco

Practical

1. Identification of crop-seeds plants and associated weeds.
2. Practical knowledge of operations from Sowing to harvesting of different crops included in theory course.
3. Judging of maturity and estimation of yields
4. Study of crop production techniques at different farms
5. Calculation of seed and fertilizer requirement of crops.
6. Preparation of seed beds of important crops.
7. Visit to farms of University and Institutes.

Course II

Semester III 2+1=3

PRINCIPLES OF PLANT BREEDING

Unit I

Plant Breeding - history, objectives and scope. Mode of reproduction in crop plants in relation to breeding techniques.

Unit II

Plant variation - kind and causes. Genetic consequences of self and cross pollinated crops. Plant introduction and exploration.

Unit III

Breeding of self ï pollinated crops - pureline, mass selection, pedigree, bulk and Back cross methods. Breeding of cross pollinated crops- recurrent selection, hybrid synthetic and composite verities. Male sterility and its importance.

Unit IV

Breeding of asexually propagated crops, clonal selection and apomixsis. Polyploidy and mutation breeding.

Practical

1. Technique of emasculation and artificial pollination in important crops.
2. Skeleton of different breeding procedures.
3. Practical record
4. Viva-voce.

Course III

Semester III 2+1=3

FARM STRUCTURES, POWER AND MACHINERY

Unit I

Farm structures - Farm silos, Food storage structures, Building materials, Farm Houses, Dairy Building, Poultry housing. Elementary knowledge about the engineering terminology and calculations on piston displacement, compression ratio, hip and efficiencies of engines. Construction and working of four stroke and two stroke cycle i.e. engines. Common engine troubles, causes and their remedies.

Unit II

Classification of tractors, elementary knowledge about the following main components of tractor and their functions - steering, clutches, transmission, differential and final drive, brakes, belt, pulley PTO Shift and hydraulic lift. Methods of starting and stopping of tractors. General care and maintenance.

Unit III

Study of simple parts, operation and installation of an electric motor (Induction type only). Calculation of h.p., units consumed. Role of switches, fuses and starter.

Unit IV

Study of construction, working principles, troubles and adjustments of the following machines. Disc plough, disc harrow, seed-drill, Planter, reaper mower, threshers, combine, sprayers and dusters. Calculation of area covered, power requirement and efficiency of above machines.

Practical

1. Preparation of layout for farm houses, dairy barn and poultry housing.
2. Study of construction of four stroke and two stroke cycle engines, operating and running of diesel engines.
3. Study of tractor systems, tractor driving practice.
4. Study of disc plough, study of seed drill, planter and its calibration, study of threshers and combine.
5. Visits to places of engineering interest.
6. Identification of different workshop tools and machines and their uses.

Course IV

Semester III 2+1=3

ENVIRONMENTAL SCIENCES AGRO-ECOLOGY

Unit I

Ecology - definition, division and significance. The Environment - environmental management and control of pollution, factors affecting plant growth abiotic and biotic factors interaction.

Unit II

Ecosystem - major ecosystems, energy and its flow in ecosystem, biochemical cycles and nutrient cycles. Plant community - classification, composition, and study of plant community structure.

Unit III

Plant adaptation - ecological classification of plants and their morphological, anatomical and physiological adaptations to adverse environments - hydrophytes, xerophytes, mesophytes, epiphytes and halophytes.

Unit IV

Ecological problems of major crops - cereals, millets, pulses and oil seeds

Practical

1. To record temperature, relative humidity and light intensity values of the atmosphere.
2. To study the community by quadrate method by determining frequency, density and abundance of different species present in the community.
3. To study the vegetation of the given area by a physiognomic method - logical spectrum method.
4. To determine the biomass producers in the given area.
5. to record abiotic components - pH, temperature, light intensity, turbidity in pond-ecosystem.

Course V

Semester III 2+1=3

AGRICULTURE MARKETING, EXPORT AND COOPERATION

Unit I

Market Meaning, Scope and Classification of markets. Definition of agricultural marketing, demand, supply and price. Marketable surplus, marketed surplus. Integrated marketing. General Theory of markets and marketing. Demand for agriculture produces. Production and market supply.

Unit II

Price Determination and price analysis under different market structure. Marketing Functions and services. Marketing costs margins and efficiency. Defects of Present system of marketing of agricultural produce. Steps taken by the Indian Government and possibilities of improvements. Fixation of agricultural Prices. Marketing Institutions and Cooperative Markets. Market Research.

Unit III

The concept of export as a district business activity in agricultural sector of the Indian economy, its importance and role in economic development. Policies of export of food, grains and agricultural commodities pursued by the Indian government. Import vs. export values at cereals and other agricultural commodities. Agencies engaged in exporting agricultural goods.

Unit IV

Meaning and Concept of cooperation, principles of Cooperation (Equality, universality, distributive, justice, democracy, unity, honorary services voluntarism). Place of thrift in cooperation, economic planning and cooperation. History and Progress of cooperative movement in India. Structure and organization of agricultural cooperation in India. National cooperative federations, courses of slow growth of agricultural cooperatives, suggestions for rapid development. National Bank for agricultural and Rural Development (1982). Cooperative farming Meaning thereof, New Classification of Cooperative farming, Cooperative Joint Farming, Cooperative Collective Farming. Advantages thereof. Reasons for apathy al farmers in adopting Cooperative Joint Farming.

Practical

1. Survey of market (Mandi) both primary and secondary (at least one each).
2. Case studios of marketing of a minor and a major commodity w.r.t. marketing channels costs margin and price spread over.
3. Study of a (i) cooperative marketing society (ii) a warehouse functioning market (iii) a regulated market and (iv) a cold storages.
4. Submission of a report on the above four aspects.

Course VI

Semester III 2+1=3

VEGETABLE PRODUCTION

Importance and scope of vegetable production in India; Classification of vegetables; Types of vegetable gardens; Culture and seed production of major vegetables like

Unit I

Potato, Brinjal, Chilies, Tomato

Unit II

Cauliflower, Cabbage, Onion

Unit III

Bottle, gourd. Musk melon, Watermelon

Unit IV

Okra, Radish, Carrot and Pea.

Practical

1. Nursery rising of vegetable crops,
2. Production of Seeds in vegetable available at the time of course
3. Cost of cultivation studies in Potato, Tomato, Cauliflower and Okra
4. Production oriented training in cultivation of vegetable crops.

Course VII

Semester III 1+1=2

ELEMENTRY MICROBIOLOGY AND SOIL MICROBIOLOGY

Unit I

Definition, scope and importance of microbiology

A brief survey of microbiology:

(i) Prokaryotes and Eukaryotes.

(ii) Types of microorganisms Algae, protozoa, fungi, bacteria and viruses.

(iii) Size relationships.

(iv) An elementary idea of general characteristics, classification and reproduction of fungi, algae and protozoa.

Unit II

Simple staining and Gram staining techniques of bacteria. Characteristics of gram positive and gram negative bacteria. Classification of bacteria (only important groups)

Unit III

Biogeochemical cycles: Nitrogen, Carbon, Sulphur and Phosphorous.

Unit IV

General structure of and replication bacteriophage. Sterilization, disinfection and types of sterilization.

Practical

1. Study of different parts of light compound microscope and their functions.
2. Gram staining of bacteria.
3. Preparation of nutrient broth, Czapekôs and Richardôs media.
4. Identification of algae, fungi and protozoa.
5. Practical record
6. Viva vote

Course VIII

Semester III 0+1=1

CROP PRODUCTION - I