

C.C.S.University, Meerut

Syllabus For M.Sc.(Ag.) Horticulture

J-1061: Fundamentals of Vegetable Production

Unit – I

Importance, present position and future scope of olericulture in India. Food value of vegetables. Type of vegetable growing. Classification of vegetables.

Unit – II

Soil and climatic requirement of vegetables (Chilling requirement and heat unit). Irrigation and drainage management. Nutrient and fertilizer management.

Unit – III

Nursery management in vegetable growing. Intercultural operations (hoeing, weeding, staking, earthing-up, inter cropping and mixed cropping)

Unit – IV

Role of plant growth regulators (PGR) in vegetable growing. Use of plastics in vegetable cultivation. Protected cultivation of vegetable crops.

Unit – V

Integrated Pest and Disease management. Integrated Nutrient management (INM).

Hydroponics and Aerobics.

J-1062 : Propagation and Nursery management

Unit-I

Need for plant multiplication. Sexual and asexual method of propagation, their advantages. Seed : morphology , anatomy, maturity , seed dormancy , factors affecting dormancy and methods to overcome them . apomixes – mono embryony, polyembryony .

Unit-II

Methods and techniques of cutting , layering , grafting, and budding , Factors affecting rooting of cuttings and layering . Anatomical studies of bud union . Stomatal effects and their influences.

Unit-III

Establishing of horticultural nursery . Selection and maintenance of mother plants , collection of scion wood , rootstock. Lifting and packing of seedling from nursery . Nursery tools and implements.

Unit-IV

Propagation structures(glasshouse, polyhouse, mist chamber, cold frames, hot beds, lath house, humidifier etc.) . Role of polythene in propagation .

Unit-V

Use of plant growth regulators (PGR) in sexual and asexual propagation . Disease and insect pest management of nursery plants. Micro- propagation.

J- 1063: Fundamentals of ornamental Gardening

Unit-I

History, importance , present position and scope of landscape gardening. India Principles of garden designs – initial approach , axis, focal point , mass effect , unity , space , divisional lines, proportion and scale, texture, mobility, light , tone and colour.

Unit-II

Style of gardening(formal garden, informal garden , Wild garden) with special reference of Mughal garden , Japanese garden , Persian garden , French garden , Italian garden , English . Garden features : pavements and steps , fences and gates, hedges and edges, arch , pergola, screens and borders , lawn , flowerbeds, shrubberies, rosery, rockery, water body and bridges. Garden adornments- stone lanterns and basins , statues , towers , sundial, topiary, bird bath , saddle stones and floral clock.

Unit-III

Specialized gardens: Indoor gardening , pots and containers , potting mixtures. Water garden , rock garden, roof garden, vertical garden, marsh or bog garden , stunken garden, gardening in the shade. Landscaping of highways , railways station and railway lines , along bank of rivers and canals, city , town and country-sides, public buildings, educational institutions, factories, places of historic importance, places of worship, small home ground , crematories and burning ghats .

Unit-IV

Flowering annuals – classification , colour scheme and grouping (monochromatic, analogous, complementary or contrasting).

Ornamental trees – ecological adaptation , plantation , and after care of trees.

Ornamentals shrubs –morphological characters and cultural practices.

Ornamentals climbers – description of ornamental climbers and theirv planting.

Cacti and succulents, palm and cycads , ornamentals grasses , bonsai.

Unit-V

Garden practices: plantings and transplanting, stopping and pinching , deshooting and disbudding , defoliation , stalking, pricking, shading, training and pruning ,wintering, clipping or culling of hedges and edges , mulching. Floral ornaments and flower arrangement.

J-1065: Practical I : (based on above 4 theory courses 1-4)

II Semester

J- 204 : Statistical methods in agriculture

J- 261 : Production Technology of Vegetables and spices

Improved production technology of vegetable crops with special reference to origin and distribution, soil and climate , land preparation , improved varieties , sowing and planting , irrigation , fertigation, intercultural operations, training , pruning and staking, harvesting, major insect-pest and disease control measures , storage and marketing.

Unit-I

Solanaceous fruit vegetables – tomato , brinjal , chilli and capsicum, and potato and okra.

Unit –II

Cole crops – cauliflower , cabbage, knol khol and broccoli, and

Root crops- radish, carrot , beet root and turnip.

Unit-III

Peas and beans – pea, French bean , cowpea, broad bean.

Green Leafy vegetables – spinach , palak, amaranth, and Bulb crops – onion and garlic

Unit-IV

Cucurbits – cucumber , muskmelon, watermelon, bottle gourd, bitter gourd, pumpkin and squashes , sponge gourd , ridge gourd, and

Tuber crops – colocasia (arvi and banda) , elephant foot yam , sweet potato , cassava.

Unit – V

Spices – cumin , coriander, fenugreek , fennel , ginger, turmeric etc.

Important physiological disorders of vegetable crops.

J-2062 : Orchard Management

Unit-I

Establishing of orchard – selection of site , planning , selection, and procurement of quality planting material , soil preparation , layout, planting systems , digging of pits, planting , after care of young plants.

Unit-II

Irrigation management of fruit trees ; water requirement and method and time of application .
Abnormalities caused due to excess and deficiency of moisture . Manurial requirement of fruit trees
, major and minor nutrients , nutrients deficiency and their remedies , foliar feeding.

Unit-III

Growing and fruiting habits of fruit trees . Training and pruning in fruit trees . Clean cultivation , sod
culture , intercropping , cover crops , filler crop.

Unit-IV

Pollination and pollinizers . Unfruitfulness, factors affecting and remedial measures .Alternate
bearing , factors affecting and remedial measures . Fruit thinning , fruit drop and fruit splitting

Unit-V

Rejuvenation of old and uneconomic orchards . Protection from insect- pest and diseases High
density planting system in orchards. Dryland farming in fruit crops

J-2063 : Production Technology of Ornamental Crops

Production technology of flower crops with special reference to origin , history and distribution , soil
and climate , land preparation , training , pruning and staking, harvesting/picking, major insect pest
and disease control measures , storage and marketing.

Unit-I

Rose, carnation, chrysanthemum and dahalia.

Unit-II

Gladiolus , tuberose, lilies, tulip and alstromeria.

Unit-III

Marigold, gerbera, aster , orchids and jasmine.

Unit-IV

Cultivation of cut flower crops, cultivation of loose flower crops , cultivation of cut foliage/ cut
greens

Unit-V

Greenhouse cultivation of important flower and ornamental crops

J-2065: Practical II (Based on above 4 theory courses)

III Semester

J-3061: Fundamentals of Fruit Production

Unit-I

Importance , present position and future Scope of fruit culture in India . Classification of fruit crops.

Unit-II

Flowering and fruiting of fruit crops: Inflorescence , forms of flower , blooming period, pollination and pollinizers , bearing habit , habit , type of fruits, etc.

Unit-III

Soil and climatic requirements of fruit crops . Irrigation requirements of fruit crops. Irrigation requirements of fruit crops: irrigation methods time and amount of water application . Nutritional requirement of fruit : deficiency symptoms , fertilizer dose , method and time of application.

Unit-IV

Insect- pest management in fruit crops . Disease management in fruit crops .

Unit-V

Marketing of fruit crops in India.Import and export of fruits and their products . Use of plant growth regulators (PGR)in fruit setting , fruit thinning, fruit drop, parthenocrapy, yield and quality of fruits.

J-3062 : Breeding of Vegetable and Ornamental Crops

Unit-I

History of vegetable and ornamental Breeding research and infrastructure in India . Centre of origin and genetic variability of vegetable crops . Mendels laws of inheritance . Qualitative and quantitative inheritance . Self incompatibility , male sterility. Heterosis and inbreeding depression . mutation breeding . Hybridization techniques. Polyploidy in crop improvement. Bio technology and genetic engineering.

Unit-II

Self pollinated vegetable crops : mechanism of self pollination. Breeding procedures and techniques of self pollinated vegetable crops.

Unit-III

Cross pollinated vegetable crops, mechanism of cross pollination . Genetic composition of cross pollinated populations. Selection in cross pollinated populations, Hardy Weinberg Law. Breeding procedures and techniques of cross pollinated vegetable crops . hybrid and synthetic varieties.

Unit-IV

Breeding of major vegetable crops: tomato , brinjal, chilli, and capsicum, cauliflower, cabbage, onion, radish , carrot, pea, French bean, cucumber,muskmelon, watermelon, bottle gourd, bitter gourd, pumpkin, and squashes, pointed gourd , okra, potato, colocasia, elephant, foot yam etc.

Unit-V

Breeding of important flower crops: Rose , carnation, chrysanthemum, gladiolus,marigold , gerbera, aster, orchids, lilies, tulip, jasmine,dahalia,alstromeria.

J-3063: Fundamentals of Preservation of Horticultural Crops

Unit-I

History, importance, present position , and scope of preservation. General principles of fruit and vegetable preservation .

Unit-II

Enzymatic and textural changes , respiration, and transpiration of fruits and vegetables. Spoilage in fruit and vegetable preservation unit.Equipments for home and commercial production .

Unit-IV

Methods of preservation. Preservation by drying and dehydration. Preservation by Freezing. Preservation with sugar and chemicals. Preservation with salt and vinegar.

Unit-V

Fermentation . Browning reaction. Food colour. Food flavour.Enzymes and other micro organisms in preservation of fruits and vegetables.

J-3064: Post Harvest Technology Of Horticultural Crops

Unit-I

Importance of post harvest management in fruits, vegetables and ornamental crops . Component of quality, variability due to genetic environmental and cultural factors, Stage and time of harvesting water quality and relation.Pre and post harvest factors related to post harvest deterioration of horticultural crops .Physiological and biological changes during and after maturity in horticultural crops.Post harvest losses.

Unit-II

Maturity indices. Hardening and delaying ripening process in fruit crops. Time and method of Harvesting. Pre and post harvest treatment of horticultural crops.Methods of storage. Type of Storage.Pre cooling.Control And modified atmospheric storage, low pressure storage.Grading, packing and transportation of horticultural crops.

Unit-III

Post harvest management of important fruit crops; Mango, Banana ,Papaya,Guava,Litchi,Grapes, Apple etc.

Unit-IV

Post harvest management of important vegetable crops; Solonacius fruit vegetables, cole crops, peas and beans , root and bulb crops, tuber crops,green leafy vegetables, cucurbits,okra,potato etc.

Unit-V

Factors affecting bud and flower development, sensation , carbohydrate and nitrogen metabolism. Role of applied sugars , growth regulators, metallic salt and other chemicals on delaying quality deterioration. Special features like bent neck, flower bud abscission, geotropic bending, foliage discoloration, pulsing, bud opening and folding solution etc. Post harvest management of rose , cafrnation, chrysanthemum, jerbera, gladiolus, orchids, tulip, liliesetc.

J-3065:Practical III (Based on the above theory courses)

IV Semester

J-4061 : Production of fruit crops

Unit-I

Improved production technology of fruit crops with special reference to origin, history and distribution , soil and climate , land preparation, improved varieties , sowing and planting , irrigation, fertigation,inter cultural operation ,training ,pruning and staking, harvesting/ picking , major insect pest and disease control measures.Storage and marketing,

Tropical fruits: Mango,guava, papaya banana, jack fruit,pineapple, sapota, arecanut,

Unit-II

Subtropical fruits: citrus , litchi, loquat, falsa.pomergranate, aonla,bael,ber and grapes.

Unit-III

Temperate fruits: Apple, peach,pear, plum, almond and apricot and other fruits of minor importance.

Unit-IV

Study if important physiological disorder of fruit crops : Aonla necrosis, bitter pit of apple, yellow spot, granulation of citrus , shot berry, pink berry, hen and chickens of grapes, fruit cracking of pomergranate and litchi , multiple crown of pineapple , black tip, tapper tip,tip pulp,gridle necrosis,sunburn, jelly seed, soft nose, stem endrought, internal fruit necrosis of mango.

Unit-V

Major problem of fruit growing- mango malformation, alternate bearing, sponge tissue in mango, bunchy top of banana, guava wilt, citrus canker, root built of coco nut, yellow leaf disease of arecanut etc.

J-4062 Breeding of fruit crops

Unit-I

History and infrastructure of fruit breeding in India. Centre of origin of fruit crops, objective of fruit breeding.

Unit-II

Breeding of major fruit crops with special reference to origin and distribution, genetic diversity, germ plasm resource, wild species, botany, floral biology, pollination, inheritance pattern, pre selection criteria , breeding objectives, breeding methods and achievements, improved varieties and future research thrust.

Tropical fruits: Mango, guava, papaya banana, jack fruit, pineapple, sapota, arecanut,

Unit-III

Subtropical fruits: citrus , litchi, loquat, falsa, pomegranate, aonla, bael, ber and grapes.

Unit-IV

Temperate fruits: Apple, peach, pear, plum, almond and apricot .

Unit-V

Breeding of abiotic stress (Salt tolerance, Moisture stress, High and low temperature). Breeding for insect- pest and disease resistance.

J-4063 : Processing of fruits and vegetables

Unit-I

Treatment prior to processing the fruits and vegetables. Drying and dehydration of fruits and vegetables, smoking and sulphuring, freezing of fruits and vegetables, freezing units , cold storage etc.

Unit-II

Preservation with sugar-candy , preserve, crystallised fruit.

Preservation with sugar acid and chemicals- Jam, jelly, marmalade.

Unit-III

Preservation with salt and vinegar- Pickles, Chutni, Sauce/ketchup. Brinr solution and brining.

Unit-IV

Unfermented and fermented fruit beverage, ready to serve(RTC) drinks, some other products from fruit and vegetables(Mushroom processing etc.).

Unit-V

Quality control of processed products-FPO and AGMARK specialization ,government policy on import and export of processed fruit and food law. Chemical preservatives, Vinegar. Importance of byproducts from processing plants.Food poisoning and their control measure.

J-4064 : Seed Production Technology of Vegetable and Flowers

Unit-I

History, Importance, present position and future scope of vegetable and flower seed production in India. Seed its morphology and anatomy and type.

Unit-II

Seed production technique of major vegetable crop. Solonacius fruit vegetables- Tomato, brinjal, chilli, and capsicum. Cole crops – Cauliflowers, cabbage,knol khol and broccoli.Root Crop- Carrot ,Raddish, Beet root and turnip. Peas and beans- pea, French bean, Cow pea, Cucurbits-Cucumber, Musk melon ,Water melon , bottle gourd. Bitter gourd, Pumpkin,and Squashes, sponge gourd,ridge gord,onion , okra , spinach.

Unit-III

Seed [production techniques of important flower crops- Rose, carnation , chrysanthemum, gladiolus, marigold;dahalia, jerbera, aster, orchids, lilies, tulip, jasmine, dahlia,alstromia etc.

Unit-IV

Land / Field standards in seed productions.Seed standards and evaluation , seed testing, seed processing.Seed packing and storage . Seed certification, Seed production , and Certification .

agencies.

Unit-V

Indian seed industry. Qual;ity sontrol of vegetable and flower seeds. Seed policy .Quarantine.

J-4065 : Practical IV (Based on above 4 theory courses).

