BVoc PROGRAM (4 years Honors)

2020-21 onwards (21jan21)

B Voc
HORTICULTURE

Members of BOS (Contact details)		
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Note: BOS is to provide final soft copy in PDF and word formats and four copies of hard copies in bounded form to the office of Dean Academic affairs.

1. Resolutions of the Board of Studies

Meeting held on: - -21…….Time:10.30 am
At: Convention center, AdikaviNannaya University
RAJAMAHENDRAVARAM

Agenda: 1.Discussion on the format, syllabus of the proposed B Voc (Horticulture) Course

- Eligibility of students
- Eligibility of faculty
- Other requirements

Members present:

- Dr A Matta Reddy
- Dr K V Seetharamaiah
- Dr A Srinivasa Rao
- Dr V Padmavathi
- Dr Mutyala Naidu

Resolutions:

- Approved the format of the course as it was as per the guidelines given by the UGC ,APSCHE and ANU for the formation of Vocational courses
- Resolved to approve the course up to 4th semester of the course
- Approved the titles of the courses, credits and teaching hours
- Approved the syllabus of the courses, Model papers
- Resolved to approve the paper setters of the courses from outside the university
- Resolved to approve the paper evaluators of the courses from the university

2. DETAILS OF PAPER TITLES & CREDITS

ADIKAVI NANNYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
Course structure and syllabi: w.e from 2020-2021 Admitted Batch

Sem	Course no	Course name	Course type (T/L/P)	Hrs/Week (Sciences 4+2)	Credits (Science 4+1)	Each course Evaluation		
						Conti-Assess	Univ-exam	Total
I Year; Semester I								
I	1	Chemistry (Inorganic and Physical Chemistry) *	T	4	4	25	75	100
	2	Chemistry (Practical-I Analysis of salt mixture) *	L	2	1	0	50	50
	3	Principles of Horticulture	T	4	4	25	75	100
	4	Principles of Horticulture Practical	L	2	1	0	50	50
	5	Introduction to Soil Science	T	4	4	25	75	100
	6	Introduction to Soil Science Practical	L	2	1	0	50	50
	7	Principles of crop physiology	T	4	4	25	75	100
	8	On Job Training	L	2	1	0	50	50
		Total		**24**	**20**			
I Year; Semester II								
II	1	Chemistry (Organic and General Chemistry) *	T	4	4	25	75	100
	2	Chemistry (Practical-II Volumetric Analysis) *	L	2	1	0	50	50
	3	Plant propagation and Nursery Management	T	4	4	25	75	100
	4	Plant propagation and Nursery Management Practical	L	2	1	0	50	50
	5	Principles of Plant breeding	T	4	4	25	75	100
	6	Principles of Plant breeding Practical	L	2	1	0	50	50
	7	Vegetable Science	T	4	4	25	75	100
	8	On Job Training	L	2	1	0	50	50
		Total		**24**	**20**			

Note; Course type code: T: Theory, L: Lab, P: Problem solving

***Common With B.Sc**

II Year; Semester III								
Sem	Course no	Course name	Course type (T/L/P)	Hrs/Week (Sciences 4+2)	Credits (Science 4+1)	Each course Evaluation		
						Conti-Assess	Univ-exam	Total
III	1	Chemistry (Organic Chemistry and Spectroscopy) *	T	4	4	25	75	100
	2	Chemistry (Practical – III Organic preparation and IR Spectral Analysis) *	L	2	1	0	50	50
	3	Production technology of Fruit & Flower Science	T	4	4	25	75	100
	4	Production technology of Fruit & Flower Science practical	L	2	1	0	50	50
	5	Production Technology of Spices & Plantations Crops	T	4	4	25	75	100
	6	Production Technology of Spices & Plantations crops Practical	L	2	1	0	50	50
	7	Agricultural Economics &Farm Management	T	4	4	25	75	100
	8	On Job Training	L	2	1	0	50	50
		Total		**24**	**20**			
II Year; Semester IV								
IV	1	(Chemistry Inorganic, Organic and Physical Chemistry) *	T	4	4	25	75	100
	2	Chemistry (Practical – IV Organic Qualitative analysis) *	L	2	1	0	50	50
	3	Chemistry (Inorganic and Physical Chemistry) *	T	4	4	25	75	100
	4	Chemistry (Practical-V Course Conductometric and Potentiometric Titrimetry)*	L	2	1	0	50	50
	5	Principles of Organic Farming	T	4	4	25	75	100
	6	Principles of Organic Farming Practical	L	2	1	0	50	50
	7	Diseases of Horticultural crops & their management	T	4	4	25	75	100
	8	Diseases of Horticultural crops & their Management Practical	L	2	1	0	50	50
	9	Pests of Horticultural crops their &Management	T	4	4	25	75	100
	10	Pests of Horticultural crops their &Management Practical	L	2	1	0	50	50
	11	Farm Power & Machinery	T	4	4	25	75	100
	12	On Job Training	L	2	1	0	50	50
		Total		**36**	**30**			

Note; Course type code: T: Theory, L: Lab, P: Problem solving

***Common With B.Sc**

a. Proposed combination subjects:

1. Chemistry
2. Horticulture

b. Student eligibility for joining in the course:

Pass in Intermediate (10+2)
Pass in Diploma in Agriculture & Horticulture (10+2)

c. Faculty eligibility for Teaching the course

Post Graduate in Horticulture & Agriculture with Specialization in any Horticultural & Agriculture Science Subjects

d. List of Proposed Skill enhancement courses with syllabus, if any

All core papers are skill enhancement courses

e. Any newly proposed Skill development/Life skill courses with draft syllabus and required resources

NO

f. Required instruments/software/ computers for the course (Lab/Practical course-wise required i.e., for a batch of 15 students) : Enclosed separately in Annexure I

g. List of Suitable levels of positions eligible in the Govt/Pvt organizations

Suitable levels of positions for these graduates either in industry/govt organization like, technical assistants/ scientists/ school teachers., clearly define them, with reliable justification

S.No	Position	Company/ Govt organization	Remarks	Additional skills required, if any
1	Teaching Asst	Public & private B Voc Colleges		
2	Technical Asst	Public and private agri industries involved in the ag inputs		
3	Marketing managers	Public and private agri industries involved in the ag inputs		
4	Extension officers	Public and private agri industries involved in the ag inputs		

h. List of Govt. organizations / Pvt companies for employment opportunities or internships or projects

S.No	Company/ Govt organization	Position type	Level of Position			
1	ATMA	internship	Middle managemant			
2	Dept of agriculture	M H O H E O Tech.Asst	Middle management Village level			

i. Any specific instructions to the teacher /paper setters/Exam-Chief Superintendent

NIL

3. Program objectives, outcomes, co-curricular and assessment methods

B. VOCATION	HORTICULTURE

Programme objectives & Outcomes

1. Horticulture is a very comprehensive subject that involves various aspects. The entire programme is aimed at making the students understand basic aspects and practices involved in agriculture from seed to seed i.e., production aspects, protection aspects, storage and marketing aspects of an agricultural product. It also involves economic aspects such as cost of production, cost of selling, profit etc, .The student will also able to establish an entrepreneur on his own and help to generate employment to others. By learning extension methodology to transfer of technology, he will acquire good communication skills and equip himself with personality development and become centre of attraction which helps him to become a successful entrepreneur.
2. This course also makes the students understand the basic requirements such as soil, water, nutrients, implements, labor, plant protection chemicals, finance and their management. The students should understand basic concepts of soil genesis, soil fertility, its various parameters of fertility status and their estimation and soil fertility conservation methods for sustainable agriculture.
3. The students should understand the life line of crop production i.e, Irrigation – sources of irrigation, water requirement of crops and or plants- critical stages of moisture stress agriculture with different regimes of water supply – abundance to scarcity. Comprehensive and integrated water management practices, water conservation practices particularly in dry land agriculture, rain fed agriculture etc,.
4. The students should be well versed with production aspects of agriculture, such as crop selection , varietal selection within crops based on resources and weather parameters , such as irrigation resources, rainfall quantity, distribution , droughts, floods , saline waters etc,.
5. The students should be well aware of field diagnostic techniques and crop conditions to identify nutritional disorders, biotic and abiotic stresses to the crop such as pests, diseases, salinity, moisture stress, (low & excess) and other problems.
6. This course must give the students a thorough understanding of crop cultivation, preservation and marketing, By the end of the course, the students should realize that farming is a viable and profitable option. Thisenables the students to be entrepreneurs and job providers rather than job seekers

Co-curricular and assessment methods

1. Course seminars on various chapters related to the course
2. Collection of samples and preparing herbarium in various courses such as Entomology (Insect collection boxes), Pathology (disease symptoms on various plant parts in various crops), Agronomy & Soil science (nutritional disorders)
3. Visiting of nearby Research stations, farms and farmers fields
4. Visiting nearby agro industries
5. Participating in Kisan melas, product exhibitions, farmers training programmes,
6. Participating in the webinars relevant to the curriculum, Important topics in the subject
7. Assignments
8. Participating in live projects
9. Conducting and or participating in Quiz programmes
10. Conducting and participating in the awareness programmes in rural areas to enlighten rural women, children and also farmers in various issues.

4 Details of course-wise syllabus for Theory and Lab

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
I Year I semester
PRINCIPLES OF HORTICULTURE

THEORY: Teaching Hours: 4 CREDITS :4

LEARNING OUTCOMES:

1. The students should be realize its importance, scope and vast applications of horticulture
2. Understand the Plant propagation-methods (sexual & asexual), , grafting, budding, layering), High density planting etc.,
3. Principles and methods of training and pruning, pollination, pollinizers and pollinators; fertilization and parthenocarpy
4. Understand the Layout and planting of Vegetable gardens & ornamental garden types and parts; Lawn making, Use of plant bio-regulators in horticulture,
5. Understand the Preparation of potting mixture, potting and repotting, Fertilizer application in different crops, Visits to commercial nurseries/orchard

Theory Lecture Outlines:

UNIT 1

1. Horticulture – Definition - Divisions of horticulture with suitable examples.
2. Scope and importance of horticulture - Importance of horticulture in terms of income, employment generation, industry, religious, aesthetic, food & nutritive value and export.
3. Horticultural classification based on soil, climate and botanical classification.
4. Climate and soil for horticultural crops - Influence of environmental factors on horticultural crop production – Temperature, humidity, wind, rainfall and solar radiation – Influence of soil factors – Soil type, pH, EC.

UNIT 2

1. Propagating structures- Plant propagation- Methods - Sexual and asexual – Propagation by cuttings – Definition of cutting – Stem cuttings – Leaf cuttings – Root cuttings.
2. Propagation by Layering - Types of layering (tip, simple, compound, mound, trench, air layering) - Natural modifications of layering (runners, suckers, stolon, offset)- Propagation by separation - Bulbs, corms; division (rhizome, stem tuber, tuberous roots).
3. Grafting, budding -Rootstock and scion selection – Grafting methods – Attached scion methods of grafting, simple or approach grafting, detached scion methods of grafting (side grafting - Veneer grafting, apical grafting- epicotyl grafting, double, soft wood grafting, cleft grafting, tongue grafting, whip grafting) - Graft incompatibility – Types – Translocated and localized incompatibility; Budding –

Methods of budding – T-budding, inverted T-budding, patch budding and ring budding - Top working.

UNIT 3

1. Principles of orchard establishment – Points to be kept in mind while selecting site for the establishment of orchards - Principles and steps in orchard establishment –
2. Layout of orchards – Systems of planting - Square, rectangle, quincunx, hexagonal and contour systems of planting-their merits and demerits.
3. Principles and methods of training and pruning - Definition of training, objectives and training, principles and methods of training of fruit crops - Open centre, closed centre and modified leader systems their merits and demerits –
4. Definition of pruning, objectives of pruning, principles and methods of pruning of fruit crops.
5. Juvenility and flower bud differentiation – Methods for shortening juvenility - Application of growth regulators (Gibberellins, Auxins, cytokinins, Abscissic acid, Ethylene), environmental methods (photoperiod, temperature) - Cultivation techniques (grafting, pruning, girdling, irrigation, nutrition) –

UNIT 4

1. Bearing habits of fruit trees. Unfruitfulness, factors (physiological, phylogenical, management, parasitical, climatological) pollination –
2. Self and Cross pollination, pollinizers and pollinators - Fertilization and parthenocarpy – Types.
3. Types of vegetables Gardens – Kitchen Garden, market garden, truck garden, vegetable forcing, garden for processing, seed production garden and floating garden. Ornamental garden types – Formal – Informal – Wild Garden – Parts/ features of an ornamental garden.
4. Lawn making – Selection of Grass – Bermuda grass – Korean grass – Poa grass – Fescue grass – Kentucky blue grass - Grasses for shady areas – Site Selection – Soil - Preparation of soil – Drainage – Digging – Manuring and grading –

UNIT 5

1. Methods of planting – Sowing of seeds – Dibbling – Turfing – Maintenance of lawn – Mowing – Rolling – Sweeping –Scraping – Raking – Weeding – Irrigation
2. Top dressing with compost and fertilizers - Diseases and other problems – Fairy ring – Pale Yellow Laws.
3. Use of plant bio-regulators (PBR) in horticulture – Introduction – Applications of PBR in fruit crops.
4. Irrigation methods in horticulture crops - Different methods followed in horticultural crops (check basin, furrow, ring basin, basin, flood, pitcher, funnel, drip and sprinkler).
5. Fertilizer application- Different methods of application to horticultural crops Broad casting, top dressing, localized placement, contact placement Band placement, row placement, pellet, foliar application, starter solution, fertigation.

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
Course Syllabus of core Subjects: Horticulture under CBCS w.e.f 2020-21
I Year I semester
PRINCIPLES OF HORTICULTURE

Practicals

Teaching Hours: 2 **Credits :1**

1. Identification of garden tools.
2. Identification of horticultural crops.
3. Layout of different planting systems.
4. Layout of kitchen garden.
5. Preparation of nursery bed (raised and flat beds) and sowing of seeds.
6. . Practice of different asexual methods by divisions.
7. Practice of different asexual methods by cuttings.
8. Practice of different asexual methods by grafting.
9. Practice of different asexual methods by budding.
10. Practice of different asexual methods by layering.
11. Training and pruning of fruit trees.
12. Transplanting and care of vegetable seedlings.
13. Making of herbaceous and shrubbery borders.
14. Preparation of potting mixture, potting and repotting.
15. Fertilizer application in different crops.
16. Visits to commercial nurseries/orchard.

References

1. Chadha, K.L. 2001. Handbook of Horticulture. ICAR, New Delhi.
2. Jitendra Singh, 2012. Basic Horticulture. Kalyani Publishers. New Delhi.
3. Randhawa, G.S. and Mukhopadhyaya, A. 1994. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi
4. Kumar, N. 1997. Introduction to Horticulture. Rajyalakshmi Publications, Nagorcoil, Tamilnadu.

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
I Year Semester – I

INTRODUCTION TO SOIL SCIENCE

CREDITS: 4 **Teaching Hours: 4**

Theory: Learning Outcome:

On successful completion of this course, the student will be able to

- **Understand basic principles of Soil science**
- **Understand the soil formation, soil profile, and soil physical properties**
- **Understand the elementary knowledge of soil taxonomy**
- **Understands the problematic soils and their management**
- **Understand soil organic matter composition and its influence on soil micro organisms**

COURSE OUTLINES –SYLLUBUS OF THE COURSE

UNIT – I.INTRODUCTION:

1.1 Definition of soil
1.2 Soil as a Natural Body

UNIT - II.SOIL COMPONENTS:

2.1Soil air
2.2 Soil water
2.3 organic and inorganic solids

UNIT - III.PHYSICAL PROPERTIES:

3.1 Soil seperates, texture, Aggregation and Structural Characters, Temperature, Colour.
3.2 Properties of Soil Mixture, Pore Space, Bulk Density, Particle Density, Aeration.
3.3 Drainage, compaction, Surface area, Soil water relations.

UNIT - IV. MORPHOLOGY OF COLLOIDS & BIOLOGICAL PROPERTIES OF SOIL 4.1 Chemistry of clays, Ionic exchange
4.2 Acidity, alkalinity, PH, and salanity relations, Liming and Acidification.
4.3 Soil Orgnic matter, C:N relations
4.4 N Transformations, Soil organisms, Sulphur transformation.

UNIT - V. GENESIS AND CLASSIFICATION

5.1 Profile, Soil forming factors

5.2 Soil Survey methods

5.3Soil survey Reports

5.4 Soil distribution, Classification of Systems, Drainage, Erosion: Mechanisms - Control.

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
I Year Semester – I

INTRODUCTION TO SOIL SCIENCE
PRACTICALS

Teaching Hours: 2 **Credits: 1**

Learning outcomes

After completion of this course, the students should have learned the skills

1. Conducting chemical analysis, Principles, techniques and calculations
2. about soil physical characteristics, nutrient analysis, and soil Structure
3. Determination of infiltration rate of the soil, determination of Cat ion Exchange capacity

PRACTICAL SYLLABUS

1. Soil sampling procedures for field and horticultural crops
2. Determination of EC.
3. Determination of PH of soil.
4. Land use, texture bulk density, Definition of Soil Physical properties.
5. Determination of N, P and K of the soil
6. Determination of Sulphur.
7. Fertilizer recommendations.
8. Soil health card, parameters, EC, PH and their Importance

References

1. Indian Society of Soil Science.2012. Fundamentals of Soil Science. IARI, New Delhi.
2. Yawalkar K.S, Agarwal, T.P and Bokde, S 1995. Manures and Fertilisers. Agril. Publishing House, Nagpur
3. Samuel Tisdale, Nelson Werner L, Beaton James D and Havlin John L. 2005.
4. Soil Fertility and Fertilizers: An Introduction to Nutrient Management, Macmillian Publishing Co., New York.
5. D. K .Das 2014. Introductory Soil Science. Kalyani Publishers, New Delhi

ADIKAVI NANNAYA UNIVERSITY

Bachelor of Vocation: HORTICULTURE
2020-2021 Admitted Batch onwards
I Year Semester - I
PRINCIPLES OF CROP PHYSIOLOGY

THEORY Teaching Hours: 4 Credits: 4

Learning out comes:

Crop physiology is a very important subject that reveals the various aspects of growth of the plants and its dynamics. After completion of this course the student learns to understand

1. the process of germination, different phases of germination of the seed and plantlet growth
2. water absorption and distribution to various parts of the plant, transpiration and evaporation
3. Nutritional intake, effects of various important nutrients and their deficiency symptoms nutrient uptake mechanisms; assimilation of mineral nutrients: nitrate, ammonium,
4. Able to identify deficiency of nutrients based on symptoms and behavior of plants
5. The seed dormancy, types, methods to overcome the same
6. seed physiology: seed structures, seed development seed viability and vigour,

Lecture outlines
Theory 1.
UNIT 1

1. Introduction to Crop Physiology and its importance in Agriculture.
2. Metabolic changes during seed development - Physiological maturity, harvestable maturity - Indices of physiological maturity in crops - Seed germination - Metabolic changes during seed germination.
3. Growth and Development - Definition - Growth analysis - Growth parameters - Definitions and mathematical formulae
4. Absorption of water - Diffusion and osmosis - water potential and its components - Importance of water potential – Active and passive uptake of water – Stomatal complex – Transpiration - Water use efficiency of C3, C4 and CAM plants –

UNIT 2

1. Photosynthesis – Reactions of photosynthesis – Energy synthesis – Principle of light absorption by plants – Light reactions - Cyclic and non cyclic photophosphorylation – CO_2 fixation – C3 and C4 pathways – Significance of C4 pathway – CAM pathway and its significance – Photorespiration and its significance – Photosynthetic efficiency of C3, C4 and
2. CAM plants - Factors affecting photosynthesis (light, CO_2, temp and water stress) - Relationship of photosynthesis and crop productivity.
3. Respiration – Energy balance – Significance of respiration – Oxidative Pentose Phosphate Pathway (OPPP) and its significance – Growth respiration and

maintenance respiration – Alternate respiration – Salt respiration – Wound respiration.

UNIT 3

1. Lipid metabolism – Biosynthesis of fatty acids in plastids – Functions of lipids - Significance of lipids in plant metabolism.
2. Physiology of flowering – Photoperiodism and flowering – Importance of photoperiodism – Classification of plants based on photoperiodic responses – Perception of photoperiodic stimulus – Biological clock – Phytochrome – Flowering hormones – Vernalization and flowering – importance of vernalization in agriculture.

UNIT 4

1. Plant growth regulators – Auxins – Occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses.– Gibberellins – occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses
2. Cytokinins – Occurrence, transport, biosynthesis, mode of action and physiological roles – commercial uses –
3. ABA – Occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses –

UNIT 5

1. Ethylene – Occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses.
2. Senescence and abscission – Definition – Classification of senescence – Physiological and biochemical changes that occur during senescence - Prevention of leaf and flower senescence – Abscission and its relationship with senescence.
3. Fruit ripening - Climacteric and non climacteric fruits – Metabolic changes during fruit ripening - Hormonal regulation of fruit ripening – Ripening induction and ripening inhibition – Use of hormones in increasing vase life of flowers.

REFERENCE BOOKS:

1. GOPALA CHANDRA DE.(1989) FUNDAMENTALS OF CROP PHYSIOLOGY. Oxford & IBH Publishing Company Pvt Ltd , New Delhi

ADIKAVI NANNAYA UNIVERSITY
B.VOC: Horticulture
Semester-I, 2020-2021
OJT (ON JOB TRAINING)

Teaching Hours: 2 **Credits: 1**

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
Course Syllabus of core Subjects: Horticulture under CBCS w.e.f 2020-21

I YEAR II SEMESTER

PLANT PROPAGATION &NURSEY MANAGEMENT

Teaching Hours :4 **Credits: 4**

Learning Outcomes: On successful completion of this course, the students will be able to:

- Explain sexual and asexual propagation methods of plants
- Demonstrate skills on vegetative propagation of plants.
- Demonstrate the techniques on raising of different types of nursery beds.
- Justify the role of various propagation structures used to raise horticulture plants.
- Understand the regulation to establish a plant nursery and quality parameters to be maintained Implement different routine/regular activities in a nursery.
- Understand the economies of a plant nursery and can maintain necessary records.

Unit -1: Sexual propagation

1. Sexual propagation - advantages and disadvantages
2. Seed germination, process of seed germination factors affecting seed germination:
3. Pre-germination treatments and viability tests, sowing methods of seeds.
4. Polyembryony in propagation of Opuntia, trifoliate orange, mango and Citrus.

Unit -2: Asexual propagation

1. Asexual propagation - advantages and disadvantages.
2. Using bulbs, corms, tubers and rhizomes to raise nursery.
3. Stolons, runners and offsets in raising nursery.
4. Apomixis: Definition: role of apomictics in propagation of apple, mangosteen and Citrus.

Unit-3: Vegetative propagation techniques

1 Cuttings: Definition, propagation by root, leaf and stem cuttings

2 Layering Definition, techniques of simple serpentine, mound, trench and air layering

3 Grafting: Definition: approach and detached scion (Veneer, whip, cleft, side and bark) grafting techniques.

4 Budding: Definition; technique soft-, patch and chip budding.

Unit - 4: Basic requirements of a nursery

1. Plant nursery Definition, importance: Basic facilities for a nursery, layout and components of a good nursery,
2. Nursery beds-types, their merits and demerits, precautions to be taken during preparation
3. Brief be count of growing medium nursery tools and implements.
4. Containers for plant nursery.
5. Brief account of plant propagation structures,

Unit -5: Nursery management

1. Bureau of Indian Standards (BIS-2008) related to nursery guidelines for nursery raising
2. Nursery accreditation and Certification
3. Seasonal activities and routine operations in a nursery: watering, weeding and control of
4. pests and diseases.
5. Common possible errors in nursery activities.
6. Economics of nursery development and record maintenance, online nursery information and sales systems.

References

5. Chadha, K.L. 2001. Handbook of Horticulture. ICAR, New Delhi.
6. Jitendra Singh, 2012. Basic Horticulture. Kalyani Publishers. New Delhi.
7. Randhawa, G.S. and Mukhopadhyaya, A. 1994. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi
8. Kumar, N. 1997. Introduction to Horticulture. Rajyalakshmi Publications, Nagorcoil, Tamilnadu.

ADIKAVI NANNAYA UNIVERSITY

Bachelor of Vocation: HORTICULTURE
2020-2021 Admitted Batch onwards
I Year Semester - II
Plant Propagation and Nursery Management

Practical

Teaching- 2Hours. **Credits :1**

1. Methods of breaking dormancy in seeds, tubers, vegetative buds and other vegetative propagules

2. Media for propagation of plants in Nursery Beds, Pot and Mist chamber.

3. Preparation of nursery beds and sowing of seeds

4. Raising of root stock.

5. Seed treatments for breaking dormancy in seeds and vegetative organs of plants.

6. Preparation of plant material for potting.

7. Hardening of plants in the nursery.

8. Practicing different types of vegetative propagation techniques - cutting, layering grafting and budding:

9. Preparation of plant growth regulators for seed germination and vegetative propagation

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
I Year – II Semester

PRINCIPLES OF PLANT BREEDING

THEORY Teaching Hours :4 **Credits :4**

Learning Outcomes:

- The students should understand what is Plant breeding –its important in increasing the production, Productivity, Quality, resistance to biotic and abiotic stresses etc
- Understand the different special breeding methods of improvement in both self and cross pollinated crops
- the students should understand, acquaint and practice with the breeder's kit and its contents
- the students should have enough practice in emasculation, pollination and production of New hybrids in both self, cross pollinated crops and asexually propagated plants
- the students should have been the experts in selection of superior plants and progenies from the segregating generations
- the students should have well acquainted with statistical procedures to evaluate different varieties, populations and segregating generations

Lecture outlines Theory

UNIT 1

1. 1 Plant Breeding - Definition, aim, objectives, history and developments of plant breeding, - Landmarks in plant breeding - Scope of plant breeding.
2. Modes of reproduction and apomixes - Asexual reproduction (vegetative reproduction and apomixis) and sexual reproduction - Their classification and significance in plant breeding.
3. Modes of pollination - Classification of crop species on the basis of mode of pollination– self pollination – mechanisms promoting self pollination – Genetic consequences of self pollination – Cross pollination – Mechanisms promoting cross pollination – Genetic consequences of cross pollination – Often cross pollinated crops.
4. Self– incompatibility - Classification – Heteromorphic, homomorphic, gametophytic and sporophytic systems of incompatibility – Advantages and disadvantages – Utilization in crop improvement.
5. Male sterility- Genetic consequences, cultivar options - Different types – Genetic, cytoplasmic and cytoplasmic genetic male sterility – Inheritance and maintenance– utilization of male sterile lines in hybrid seed production – Their advantages and disadvantages.

UNIT 2

1. Germplasm collections – Genetic erosion – Main reasons of genetic erosion – Extinction - Gene sanctuaries - Gene banks – Types of gene banks.
2. Breeding methods in self pollinated crops - Modes of selection - Selection – Natural and artificial selection, heritability (narrow and broad sense) – Genetic advance as per cent of mean.

3. Mass selection – Procedure for evolving a variety by mass selection – Modification of mass selection – Merits, demerits and achievements.
4. Pure line selection - Johannsen's pure line theory and its concepts and significance – Origin of variation in pure lines – Characters of pure lines – Progeny test, genetic basis of pure line selection – General procedure for evolving a variety by pure line selection – Merits, demerits and achievements – Comparison between mass and pure line selection.

UNIT 3

1. Hybridization techniques - Hybridization – Aims and objectives – Types of hybridization – Pre- for hybridization – Procedure / steps involved in hybridization.
2. Pedigree method – Procedure – Merits, demerits and achievements. Bulk method – Procedure – Merits, demerits and achievements – Comparison between pedigree and bulk methods - Single seed descent method – Merits and demerits.
3. Backcross method of breeding–Its requirements and applications – Procedure for transfer of single dominant gene - Procedure for transfer of single recessive gene – Merits, demerits and achievements - comparison between pedigree and backcross method.
4. Recurrent selection – Different types – Detailed procedure of simple recurrent selection and other recurrent selection methods – Conclusion on the efficiency of different selection schemes.

UNIT4

1. Heterosis - Heterosis and hybrid vigour – Luxuriance – Heterobeltiosis – heterosis in cross pollinated and self pollinated species – Manifestations of heterosis- Genetic basis of heterosis – Dominance, over dominance and epistasis hypotheses – Objections and their explanations – Comparison between dominance and overdominance hypotheses – Physiological basis of heterosis – Commercial utilization.
2. Inbreeding depression - Brief history – Effects of inbreeding – Development of inbred lines and hybrids– History of hybrid varieties – Important steps in production of single and double cross hybrids .
3. Composite and synthetic varieties - Production procedures – Merits, demerits and achievements – Factors determining the performance of synthetic varieties – Comparison between synthetics and composites.

UNIT 5

1. Mutation breeding - Methods and uses - Mutation breeding – Procedure of mutation breeding – Applications – Advantages, limitations and achievements.
2. Breeding for important biotic and abiotic stresses
3. Polyploidy in relation to plant breeding - Polyploidy – Auto polyploids – Origin and production – Morphological and cytological features– Applications in crop improvement – Limitations– Allo polyploidy – Morphological and cytological features– Applications in crop improvement – Limitations.

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: AGRICULTURE & ENTREPRENEURSHIP
2020-21 Admitted Batch
I Year Semester – I
PRINCIPLES OF PLANT BREEDING
Practical

Teaching Hrs :2 **Credits -1**

1. Plant Breeder's kit.
2. Study of germplasm of various crops.
3. Emasculation and hybridization techniques in self pollinated crops – rice, groundnut.
4. Emasculation and hybridization techniques in self-pollinated crops – green gram,
5. Emasculation and hybridization techniques in cross pollinated crops – maize,
6. Emasculation and hybridization techniques in often cross pollinated crops – cotton.
7. Handling of segregation populations.
8. Methods of calculating mean, range, variance, standard deviation.
9. Designs used in plant breeding experiments.
10. Analysis of Randomized Block Design.
11. Estimation of heterosis, inbreeding depression and heritability.
12. Prediction of performance of double cross hybrids.

References

1. Phundan Singh, 2014. Essentials of Plant Breeding. Kalyani Publishers, New Delhi.
2. Singh, B.D. 2015. Plant Breeding: Principles and Methods. Kalyani Publishers, New Delhi.
3. Gupta, S.K. 2010. Plant Breeding Theory and Techniques.Wiley India Pvt. Ltd. New Delhi.
4. Allard, R.W. 2010. Principles of Plant Breeding. John Wiley and Sons, New York. Poehlman, J.M. and Borthakur, D. 1995. Breeding of Asian Field Crops. Oxford and IBH Publishing Co., New Delhi.

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
Course Syllabus of core Subjects: Horticulture under CBCS w.e.f 2020-21
I YEAR II SEMESTER

VEGETABLE SCIENCE

Teaching Hours; 4 **Credits: 4**

Learning Out comes:
After completion of the course, the students should able to

1. **Understand the importance of vegetables, its cultivation**
2. **Understand Role of Vegetables in Human Health and role of Vegetables in country 's economy**
3. **Understand the marketing aspects of the vegetables**
4. **Understand the classification of vegetables , Nursery raising and production technology particularly production and protection aspects of the vegetables**
5. **Vegetables are perishable goods and keeping the short shelf life in view, the production and marketing are very important.**

Lecture outlines:
Theory

Unit:-1

Olericulture.
Importance of Vegetable Cultivation.
Role of Vegetables In Human Health.
Role of Vegetables In Economy.

Unit:-2

Markets.
Types of Market.

Unit:-3

Classification of Vegetables.

Family
Season.
Edible Part.
Type of Planting.
Time of Sowing.
P.H

Unit:-4

Nursery Raising
Nursery Bed Preparation
Seed Bed Preparation.

Unit:-5

Vegetable Production, Fertilizer Application, Hybrid Verities, Deficiency Symptoms and Pest and Disease Management.

- Tomato Brinjal
- Bhendi Beans(Cluster And French)
- Chilli and Capsicum Cucurbits
- Cabbage and Cauliflower Onion.
- Carrot Tubers (Potato, Yam, Colacassia

References

1. Chadha, K.L. 2001. Handbook of Horticulture. ICAR, New Delhi.
2. Jitendra Singh, 2012. Basic Horticulture. Kalyani Publishers. New Delhi.
3. Randhawa, G.S. and Mukhopadhyaya, A. 1994. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi
4. Kumar, N. 1997. Introduction to Horticulture. Rajyalakshmi Publications, Nagorcoil, Tamilnadu.
5. Vishnu swaroop. Introduction to Vegetable Science . ICAR New delhi

ADIKAVI NANNAYA UNIVERSITY
B.VOC: Horticulture
Semester-II, 2020-2021
OJT (ON JOB TRAINING)

Teaching Hours: 2 **Credits: 1**

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
II Year – III Semester

PRODUCTION TECHNOLOGY OF FRUIT & FLOWER SCIENCE

Teaching Hours: 4 **Credits :4**

Learning outcomes:

After complete on of this course the students should be able to understand

1. The importance of fruit and flower, their economic importance, export orientation and market demand
2. The Role of fruit and flower promotion council and research centers working on fruit and flower
3. Production technologies and extraction of fruit and flower materials is very important
4. Composition and industrial importance – Products – bi products – utilization of fruit and flower are also very important.

Unit I:

Role of fruit crops in national economy, pollination mechanism-Propagation - definition - methods merits and demerits - propagation through seeds - dormancy and methods of overcoming dormancy -Vegetative propagation – merits and demerits – cutting, layering, grafting and budding rootstock influence - stock / scion relationship-micro propagation. Scope and importance of fruit crops- classification of fruit crops - area, production, productivity and export potential.

Unit II:

Climate and soil requirements – varieties – propagation - planting density and systems of planting -cropping systems - after care - training and pruning - water, nutrient and weed management-fertigation -special horticultural techniques - plant growth regulation - Important disorders - maturity indices and harvest- post harvest management. Crops: Mango, Banana, Grapes, Citrus (sweet orange, mandarin, acid lime), Papaya, Indian goose berry (Aonla)

Unit III:

Climate and soil requirements - varieties – propagation - planting density and systems of planting -cropping systems - after care - training and pruning - water, nutrient and weed management- special horticultural techniques -plant growth regulation - important disorders -maturity indices and harvest- post harvest management. Crops: Sapota, pomegranate, Guava, Pineapple, Jack, Apple, Pear, Plum.

Unit IV:

Fundamentals of Floriculture - Loose flowers and cut flowers-Classification -- scope - area and production - Domestic and export potential of commercial flowers protected cultivation - propagation - nursery practices - special practices like pinching, training and pruning - role of growth regulators

Unit V:

Loose flower: rose, jasmine, chrysanthemum, tuberose, crossandra and marigold - Cut flowers rose, carnation, cut chrysanthemum, gerbera, lilium, anthurium and tropical orchids -Macro and micro climate - varieties - planting methods - nutrient, water and weed management - Irrigation and fertigation - harvest -post harvest management practices - grading and packaging - export standards of loose and cut flowers -flower arrangement

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: Horticulture
2020-21 Admitted Batch
II Year – III Semester
PRODUCTION TECHNOLOGY OF FRUIT & FLOWER SCIENCE
PRACTICALS

Teaching Hours ;2 **Credits :1**

1. Features of an orchard - Tools, implements and machineries used for horticultural operations

2. Micro propagation, protocol for mass multiplication and hardening of fruit crops. 4. Propagation techniques, selection of planting material, varieties, important cultural practices for Mango, Banana

3. Propagation techniques, selection of planting material, varieties, important cultural practices for Grapes and Papaya.

4. Propagation techniques, selection of planting material, varieties, important cultural practices for Sapota and Guava.

5. Identification of varieties and propagation, fertilizer application and pruning practices

Reference Books:

1. Chundrawat, B.S. 1990. Arid fruit culture, Oxford and IBH, New Delhi.

2. Chandha, K.L. (ICAR) 2002, 2001. Hand book of Horticulture. ICAR, New Delhi.

3. Symmonds, 1996. Banana. II Edn. Long man, London.

4. Radha T and Mathew L., 2007. Fruit crops. New India Publishing Agency

5. S.P Singh, 2004. Commercial fruits. Kalyani Publishers, New Delhi.

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
II Year – III Semester
Production Technology of Spices and Plantation Crops

Teaching Hours:4 **Credits :4**

Learning outcomes:

After complete on of this course the students should be able to understand

1. The importance of spices &plantation crops, their economic importance, export orientation and market demand
2. The Role of Spice Board, exports promotion council and research centers working on spices
3. Production technologies and extraction of spices is very important
4. The importance of plantation crops, its area, production and production technologies
5. Composition and industrial importance – Products – bi products – utilization of plantation crops are also very important.

Theory

UNIT I :

1. History , Scope and importance of spices-Present status- area- production –uses-export potential – role in Indian Economy
2. Classification of spices – different kinds of classification-based on the economic importance, cultivation methods, family, longevity of spice plants- type of the spice origin and flavor- plant part used – active principle
3. Role of Spice Board and exports promotion council – institutional research centers working on spices
4. History scope and importance- area- production – uses-selection of site of production- production technology (package and practices for higher production) for following Spices
    a) Cardemom
    b) Black pepper
    c) Beetlevine
    d) Ginger
    e) Turmeric

UNIT II: Production Technology of Spices

1. History scope and importance- area- production – uses-selection of site of production- production technology (package and practices for higher production) for following Spices
    a) Clove

b) Cinnamom
c) Curry leaf
d) Coriander
e) Fenugreek
f) Cumin
g) Saffron

UNIT III: **Production Technology of Plantation crops**

1. History and development –scope-importance –area- production export potential of plantation crops –Role in National and state economy
2. Introduction, origin – distribution -area – production –Uses- Composition and industrial importance – Products – bi products – utilization
3. Production technology of following plantation crops
    a) COCONUT
    b) AREKA NUT
    c) OIL PALM

UNIT IV: Production Technology of Plantation crops

1. Introduction, origin – distribution -area – production –Uses- Composition and industrial importance – Products – bi products – utilization
2. Production technology of following plantation crops
    a) COCOA
    b) CASHEW NUT
    c) DATE PLAM

UNIT V: **Production Technology of Plantation crops**

1. Introduction, origin – distribution -area – production –Uses- Composition and industrial importance – Products – bi products – utilization
2. Production technology of following plantation crops
    a) COFFEE
    b) TEA
    c) DATE PALM
    d) RUBBER

References :

1. Thampan P K 1981. Hand Book of Coconut Palm. Oxford and IBH , New Delhi
2. Ranganathan V. 1979. Hand Book of Tea Cultivation UPASI Tea Research Station Cinchona

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
II Year – III Semester

Production Technology of Spices and Plantation Crops

Practicals

Teaching Hours ;2 **Credits :1**

1. Introduction and Identification of Spices visit to instructional farm
2. Preparation and submission of specimens of minimum 30 of spices and plantation crops
3. Nursery techniques in spices and plantation crops
4. Seed treatment, sowing lay out and planting methods in spices and plantation crops
5. Manuring and irrigation and mulching in spices and plantations
6. Harvesting, processing and grading of spices
7. Description and Identification of coconut varieties
8. Epicotyls, soft wood grafting and top working in cashew nut
9. Description and Identification of species and and varieties of coffee
10. Different methods of tapping rubber
11. Visit to commercial plantations
12. Visit to nearby plantation crop research stations

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
II Year – III Semester

Agricultural Economics & Farm management

CREDITS :4 **Teaching Hours: 4**

Theory: Learning Outcome:

On successful completion of this course, the student will be able to

- Understand basic principles of Agricultural economics. How it is different from normal economics
- Understand the basics of demand, supply, and consumer's equilibrium
- Understand the elementary knowledge of Production, market structure, market dynamics and Distribution theory
- Understands the fundamental concepts of public finance, agriculture taxation , VAT, GST
- Understand the roles of money, banking, credit, price index credit and role of credit policy

COURSE OUTLINES –SYLLUBUS OF THE COURSE

UNIT I:

- Economics – meaning – definitions – subject matter of economics – traditional approach – Modern approach – microeconomics and macroeconomics- Agricultural economics – definitions – meaning – importance of agricultural economics-branches of agricultural economics - Agricultural production economics – meaning – definitions –Farm management – meaning– scope – definitions – objectives.
- Agricultural finance – meaning – definitions – micro vs macro finance –need for agricultural finance; Agricultural marketing – meaning – definition – importance of agricultural marketing.
- Basic terms and concepts in economics – goods and services – free and economic goods, utility.
- Value – definition – characteristics; price – meaning; wealth – meaning – attributes of wealth – Wants – meaning - characteristics of human wants.
- Law of diminishing marginal utility – statement – assumptions of law – explanation – limitations of the law – importance- Law of equi-marginal utility – meaning – assumptions – explanation of the law limitations of the law – practical importance

UNIT 2

- Consumer's surplus – meaning – assumptions – explanation – difficulties in measuring consumer's surplus – importance. Demand – meaning – definition – types of demand – income demand, price demand and cross demand Demand schedule – demand curve – Law of demand – Elasticity of demand – meaning – elastic and inelastic demand – kinds of elasticity of demand. 3.Price elasticity – income elasticity and cross elasticity of demand – practical importance of elasticity of demand.

- Supply – meaning – definition – Law of supply – supply schedule – supply curve Increase and decrease in supply – contraction and extension of supply – factors affecting supply -Elasticity of supply – kinds of elasticity of supply.

- Price determination – equilibrium price and quantity – determination of market price Markets – definition – essentials of market – classification of market structure – perfect and imperfect markets Characteristics of monopolistic competition – monopoly and oligopoly.

UNIT 3

- National income – concepts of national income – gross domestic product, gross national product, net national product, net domestic product -Methods of measurement of national income – product method, income method and expenditure method.
- Public finance – meaning – role and importance of public finance – functions of the government – differences between public finance and private finance Public revenue.
- Tax – meaning – classification – direct and indirect taxes – methods of taxation – proportional, progressive, regressive and degressive taxation, agricultural taxation - other types of taxation – Value Added Tax (VAT) -Canons of taxation
- Public expenditure – social and economic balanced regional growth, development of agriculture and industry, exploitation and development of mineral resources and subsidies and grants to local governments, and exports.
- Principles of public expenditure – Principle of maximum social benefits Principle of economy, Principle of sanction - Principle of balanced budget, Canon of Elasticity, Avoidance of unhealthy effects on production and distribution.

UNIT 4

- Inflation – meaning – definition – related concepts of inflation – deflation, disinflation, stagflation and reflation.
- Measurement of inflation - consumer price index, wholesale price index, producer price index and GDP deflator.
- Types of inflation – demand pull and cost push inflation – comprehensive and sporadic inflation – suppressed and repressed inflation – creeping, walking, running and galloping inflation – markup inflation- Causes of inflation.

UNIT 5

- Factors causing increase in demand – increase in money supply, increase in disposable income, increase in public expenditure, increase in consumer spending.
- Cheap monetary policy, deficit financing and increase in exports, factors causing shortage of supply – shortage of factors of production, industrial disputes, natural calamities, artificial scarcities, increase in exports, lop-sided production
- Law of diminishing returns and international factors

Remedial measures to control inflation – monetary measures – credit control, demonetization of currency and issue of new currency – fiscal measures-

ADIKAVI NANNAYA UNIVERSITY
B.VOC: Horticulture
Semester-III, 2020-2021
OJT (ON JOB TRAINING)

Teaching Hours: 2 **Credits: 1**

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
	TOTAL	50

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
II YEAR –IV SEMESTER
From 2020-21 Admitted Batch
PRINCIPLES OF ORGANIC FARMING

Teaching Hours :4 **Credits :4**

Learning outcomes:

1. After completion of this course, the students should be able to
1. Understand the definition of organic farming, key differences against chemical farming, scope, advantages and limitations.
2. Relevance of organic farming in current situations, health advantages, future prospects
3. Initiatives taken by the central and state governments, NGOs and other organizations for promotion of organic agriculture in India.
4. Marketing and export potential of organic products and national economy.
5. Nutrient management in organic farming is very very important

Theory LECTURE OUT LINES

UNIT 1

1. Organic farming – definition – need – scope – principles – characteristics - relevance to modern agriculture.
2. Different eco friendly farming systems- biological farming, natural farming, regenerative agriculture – permaculture - biodynamic farming.
3. Relevance of organic farming to A.P, India, and global agriculture and future prospects- advantages - barriers.

UNIT 2

1. Initiatives taken by the central and state governments, NGOs and other organizations for promotion of organic agriculture in India.
2. Organic nutrient sources and their fortification – organic manures- methods of composting
3. Green manures- bio fertilisers – types, methods of application – benefits and limitations.
4. Nutrient use in organic farming-scope and limitations.

UNIT 3

1. Nutrient management in organic farming.
2. Organic ecosystem and their concepts.
3. Choice of crops and varieties in organic farming – crop rotations – need and benefits – multiple cropping.
4. Fundamentals of insect, disease and weed management under organic mode of production- cultural- biological methods-non chemical pest and disease management.

UNIT 4

1. Botanicals- pyrethrum, neem seed kernel extract, neem seed powder, soluble neem formulations, neem oil.
2. Operational structure of NPOP – other agencies for organic production.
3. Inspection – certification - labelling and accreditation procedures for organic products.

UNIT 5

1. Processing, - economic consideration and viability.
2. Marketing and export potential of organic products – National economy.

References

1. Arun K. Sharma. 2002. A Hand book of organic farming. Agrobios, India. 627p.
2. Palaniappan, S.P and Annadurai, K.1999. Organic farming-Theory and Practice. Scientific publishers, Jodhpur,India. 257p.
3. Mukund Joshi and Prabhakarasetty, T.K. 2006. Sustainability through organic farming. Kalyani publishers, New Delhi. 349p.
4. Balasubramanian, R., Balakishnan, K and Siva Subramanian, K. 2013. Principles and practices of organic farming. Satish Serial Publishing House. 453p 39
5. Tarafdar, J.C., Tripathi, K.P and Mahesh Kumar, 2009. Organic agriculture. Scientific Publishers, India. 369p.

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
From 2020-21 Admitted Batch
II YEAR –IV SEMESTER
PRINCIPLES OF ORGANIC FARMING
Practicals

Teaching Hours : 2 **Credits : 1**

1. Visit to organic farm to study the various components, identification and utilisation of organic products.
2. Compost making- aerobic and anaerobic methods
3. Vermicompost preparation
4. Preparation of enriched farm yard manure
5. Visit to organic clusters and bio control lab to study the maintenance of biofertilizers/bio-inoculant cultures
6. Biological nitrogen fixers.
7. Methods of application of Bio-pesticides (Trichocards, BT, NPV)
8. Preparation of neem products and other botanicals for pest and disease control
9. Preparation of green pesticides (panchagavya, beezamrutam,jeevamrutam, ghanajeevamrutam, dravajeevamrutam).
10. Different methods of biofertiliser applications.
11. Quality analysis of biofertilisers/bioinoculants and compost
12. Case studies of Indigenous Technical knowledge (ITK) for nutrient , insect, pest, disease and weed management
13. Economic analysis of organic production system
14. Study of post harvest management in organic farming
15. Study of quality parameters of organic produce
16. Visit to organic farms to study the various components and their utilization

ADIKAVI NANNAYA UNIVERSITY
Bachelor of vocation: HORTICULTURE
2020 -21 ADMITTED BATCH
II Year – IV Semester

DISEASES OF HORTICULTURAL CROPS AND THEIR MANAGEMENT

THEORY Teaching Hours:4 **CREDITS :4**

LEARNING OUTCOMES:

1. The students should understand the importance of the course as it deals with crop management and yields of the crop
2. The nature of damage, extent of damage, ETLs remedial measures for crop protection
3. The students should identify the casual organism by seeing the symptoms and nature of damage.
4. The student should know the spraying and spraying equipment and precautions to be taken while dealing with plant protection equipment
5. Quick diagnosis, Quick decision, and correct action are very important

Lecture outlines Theory

UNIT 1

1. Study of etiology, symptoms, host-parasite relationship and specific management practices of the following diseases.
2. Citrus diseases - Citrus canker, gummosis (Phytophthora and Diplodia), sooty mold, red rust and Loranthus.
3. Guava, Papaya, Ber and Sapota diseases –Guava: wilt and anthracnose. Papaya: foot rot, anthracnose, leaf curl and mosaic and powdery mildew.Ber: Powdery mildew. Sapota: Flat limb.
4. Banana and Pomegranate diseases –Banana: Panama wilt, bacterial wilt, Erwinia rhizome rot, Sigatoka, bunchy top, banana mosaic and banana bract mosaic. Pomegranate: Anthracnose and bacterial blight.

UNIT 2

1. Grapevine diseases – downy mildew, Powdery mildew, anthracnose, Alternaria leaf spot and rust.
2. Apple and Peach diseases –Apple: scab, powdery mildew, fire blight and crown gall Peach: leaf curl.

UNIT 3

1. Chilies diseases - Damping off, die-back and fruit rot, Fusarium wilt, powdery mildew, Choanephora blight, Cercospora leaf spot, bacterial leaf spot, mosaic complex and leaf curl.
2. Brinjal and Okra diseases –Brinjal- Phomopsis blight and fruit rot, bacterial wilt and little leaf. Okra-Cercospora leaf spot, powdery mildew and Yellow Vein Mosaic.

3. Potato diseases - early and late blight, black scurf, common scab, wart, black leg, brown rot, leaf roll, mosaics, potato spindle tuber.
4. Tomato diseases - damping off, Ralston wilt, early blight, buck eye rot and leaf curl, Septoria leaf spot, bacterial canker, root knot, Tomato spotted wilt and mosaic.

UNIT 4

1. Crucifers and Cucurbits diseases –Cruciferous vegetables- Club root, white rust, Downy mildew, powdery mildew, Alternaria leaf spot and black rot. Cucurbits: downy mildew, powdery mildew, Cercospora leaf spot, Erwinia wilt and CMV.
2. Betel vine, onion and garlic diseases –Betel vine: Phytophthora root and stem rot, sclerotial wilt, Fusarial wilt, Anthracnose. Onion and garlic: Smudge, smut, purple blotch, and Stemphylium blight.
3. Beans, Colocasia and Coriander diseases –Beans- anthracnose, rust, Bean common mosaic virus and bacterial blight. Colocasia: Phytophthora blight. Coriander- stem gall.

UNIT 5

1. Coconut and oil palm diseases –Coconut- Stem bleeding, Ganoderma wilt, bud rot, grey blight and Tatipaka disease. Oil palm- Bunch rot and spear rot. Tea- blister blight Coffee- rust.
2. Turmeric, ginger and mulberry diseases –Turmeric- leaf spot, leaf blotch, rhizome rot Ginger: rhizome rot/soft rot, leaf spot. Mulberry- powdery mildew.
3. Rose- dieback, powdery mildew and black leaf spot. Marigold: Botrytis blight Chrysanthemum- wilt, stunt, Septoria blotch. Jasmine- rust. Crossandra - wilt

ADIKAVI NANNAYA UNIVERSITY
Bachelor of vocation: HORTICULTURE
2020 -21 ADMITTED BATCH
II Year – IV Semester

DISEASES OF HORTICULTURAL CROPS AND THEIR MANAGEMENT
Practical

Teaching Hours : 2 **Credits :1**

Studies of symptoms, Identification and histopathological studies of the following diseases

1. Citrus diseases.
2. Mango diseases.
3. Ber, guava and sapota diseases.
4. Field visits for the diagnosis of crop diseases.
5. Papaya, banana and pomegranate diseases.
6. Chilli, brinjal and Bhendi diseases.
7. Field visits for the diagnosis of crop diseases.
8. Tomato diseases.
9. Crucifers and cucurbits diseases.
10. Field visits for the diagnosis of crop diseases.
11. Coconut and oil palm diseases.
12. Field visits for the diagnosis of crop diseases.

Note: Students should submit 50 pressed and well-mounted specimens.

References

1. Rangaswami, G & Mahadevan, K.2001. Diseases of crop plants in India, Prentice Hall of India Pvt.Ltd, New Delhi.
2. Singh, R.S.2005. Plant Diseases. Oxford & IBH Publications, New Delhi
3. Pathak, V.N.2001. Diseases of Fruit crops. Oxford & IBH Publications, New Delhi
4. Singh, R.S.1999. Diseases of Vegetable crops. Oxford & IBH Publications, New Delhi
5. Chaube, H.S and V.S. Pundhir, 2012. Crop Diseases & Their Management. PHI Pvt.Ltd, New Delhi

ADIKAVI NANNAYA UNIVERSITY
Bachelor of vocation: HORTICULTURE
2020 -21 ADMITTED BATCH
II Year – IV Semester

PESTS OF HORTICULTURAL CROPS AND THEIR MANAGEMENT

Teaching Hours: 4 **Credits: 4**

LEARNING OUTCOMES:

1. The students should understand the importance of the course as it deals with crop management and yields of the crop
2. The students should identify the casual organism by seeing the symptoms and nature of damage.
3 The student should know the spraying and spraying equipment and precautions to be taken while dealing with plant protection equipment
4 The Students should learn to assess the damage and understand the ETLs
5 Quick diagnosis, Quick decision, and correct action are very important

Lecture outlines Theory

UNIT 1

1. Brinjal- Epilachna beetle, shoot and fruit borer, stem borer, mealy bug, aphid, leafhopper, lacewing bug, leaf webber and red spider mite- IPM practices.
2. Bhendi- Shoot and fruit borer, leafhopper and whitefly and spider mite – Tomato Serpentine leaf miner, Leaf miner/ Tomato pink worm, fruit borer and whitefly - IPM practices.
3. Cucurbits- Fruit flies, pumpkin beetles, semilooper, serpentine leaf miner and pumpkin leaf eating caterpillar - Coccinia-Coccinia gall fly and aphids - IPM practices.
4. Crucifers- Diamond back moth, cabbage head borer, leaf webber, aphid, painted bug, tobacco caterpillar and cabbage butterfly - IPM practices.

UNIT 2

1. Potato- Tuber moth - Sweet potato - Sweet potato weevil, hairy caterpillar, tortoise beetle - Moringa- Hairy caterpillar, budworm, leaf webber and pod fly - ChilliesThrips, pod borers, aphid, mites, Amaranthus- Leaf eating caterpillar, stem weevil - IPM practices.
2. Mango- Leafhoppers, stem borer, nut weevil, fruit fly, shoot borer, fruit borer, mealybug, aphids, leaf webber, termites, thrips, red tree ant, and red spider mite - IPM practices..
3. Citrus- Butterfly, fruit sucking moths, leaf miner, psylla, rust mite, bark eating caterpillar, black fly and leaf mite.
4. Grapevine- Flea beetle, thrips, mealybug, stem girdler, stem borer, root grub - IPM practices.

UNIT 3

1. Cashew- Tree borer, shoot and blossom webber, tea mosquito bug, thrips and leaf miner Pomegranate- Butterfly, thrips and fruit sucking moths - IPM practices.
2. Guava- Tea mosquito bug, mealybug, fruit flies and spiralling whitefly – Sapota Leaf webber, parijatha hairy caterpillar, mealybugs - Ber- Fruit fly, fruit borer and fruit weevil.
3. Banana- Rhizome weevil, skipper, aphid and pseudostem weevil – Papaya white flies, mealybugs and thrips - Apple - Woolly aphid and Codling moth - Custard apple- Mealybug - IPM practices
4. Coconut- Black headed caterpillar, rhinoceros beetle, red palm weevil, slug, termites, scale and mite - Oil palm- Black headed caterpillar, rhinoceros beetle and IPM practices.
5. Arecanut- Scales - Cocoa - Scales - Cardamom- Thrips - Pepper- Pollu beetle and shoot borer - Eucalyptus - Gall wasp - Neem - Tea mosquito bug and white grub - IPM practices.

UNIT 4

1. Turmeric and ginger- Rhizome fly and Lace wing bug - Betelvine- Shoot bug and tobacco caterpillar - Onion- Thrips-Spodopteraexigua - Coriander- Aphids -leaf eating caterpillar –
2. Rose- Thrips, scales, leaf eating caterpillars and chafer beetles - Jasmine- Stink bug, bud worm and gall mite - Chrysanthemum- Aphid- IPM practices –
3. Tobacco-Tobacco caterpillar, aphid, whitefly and stem borer –
4. CoffeeWhite borer, red borer and green scale; Tea- Tea mosquito bug, thrips, red spider mite, pink mite, purple mite and scarlet mite- IPM practices.
5. Economically important mite, nematode (vegetables, citrus, banana and coconut), rodent (coconut) and bird pests of horticultural crops and their management.

UNIT 5

1. Beneficial insects – Importance of silkworm, honeybee, lac insects, predators, parasitoids, pollinators, weed killers and scavengers.
2. Insect orders bearing predators and parasitoids used in pest control and their key identification characters (Dictyoptera: Mantidae; Hemiptera: Reduviidae, Anthocoridae, Lygaeidae, Pentatomidae; Neuroptera: Chrysopidae, Myrmeleontidae, Hemerobiidae; Coleoptera: Carabidae, Cicindelidae, Coccinellidae; Diptera: Asilidae, Tachinidae, Syrphidae; Lepidoptera: Noctuidae, Lycaenidae, Epipyropidae, Pyralidae; Hymenoptera: Vespidae, Braconidae, Ichneumonidae, Chalcididae, Trichogrammatidae, Platygasteridae, Elasmidae, a).
3. Mass production/multiplication methods of predators (Cheilomenes and Chrysoperla) parasitoids (Goniozusnephantidis).
4. Important species of pollinators, weed killers, and scavengers and their significance.

ADIKAVI NANNAYA UNIVERSITY
Bachelor of vocation: HORTICULTURE
2020 -21 ADMITTED BATCH
II Year – IV Semester

PESTS OF HORTICULTURAL CROPS AND THEIR MANAGEMENT
Practical

Teaching Hours:2 **Credits: 1**

1. Identification of insect pests of Solanaceous and Malvaceous vegetables -damage symptoms
2. Identification of insect pests of leafy vegetables, potato, sweet potato, moringa and chilli and their damage symptoms (Potato and Chillies are Solanaceous crops).
3. Identification of insect pests of mango, cashew, citrus & banana -damage symptoms.
4. Identification of insect pests of grapevine, pomegranate, sapota, papaya, apple, custard apple, ber and guava and their damage symptoms.
5. Identification of insect pests of coconut, arecanut, cocoa, cardamom, pepper, date palm & oil palm, eucalyptus and neem and their damage symptoms.
6. Identification of insect pests of spices, narcotics (turmeric, betel vine, onion, tobacco & ginger) and ornamental plants (jasmine, rose, chrysanthemum) and their damage symptoms.
7. Identification of economically important mite, nematode (vegetables, citrus, banana and coconut), rodent (coconut) and bird pests of horticultural crops and their management.

References

1. Vasantharaj David, B. and V.V. Rama Murthy (2016). Elements of Economic Entomology, Popular Book Depot, Coimbatore. 85
2. Butani, D.K. and Jotwani, M.G. 1984. Insects in Vegetables. Periodical Export Book Agency, New Delhi.
3. Butani, D. K. 1984. Insects and Fruits. Periodical Export Book Agency, New Delhi.
4. Nair, MRGk. 1990. Monograph on Crop Pests of Kerala and their Control. Trissur Directorate of extension, Kerala agricultural University

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
2020-21 Admitted Batch
II Year-IV Semester

FARM MACHINERY AND POWER

Teaching Hours: 4 **Credits 4**

Learning outcomes:

After completion of the course the students should able to understand

1. That farm power and machinery is a very impotent course and back bone of all the agricultural operations
2. That knowing the working of engines of tractors, power tillers, sprayers etc is also very important. Working knowledge of all the machinery is an advantage
3. Knowledge of equipment used for land preparation, sowing, transplanting, weeding, spraying and harvesting is highly useful for practicing Agriculture
4. Practice of driving tractor along with implements, power tillers, Sprayers is highly advantages for students transforming as entrepreneurs

Lecture outlines

Theory

UNIT 1

1. Farm power – Source of different farm power, advantages and disadvantages.
2. Internal combustion engine - Different components and their functions - Working principle of four stroke and two stroke cycle engine - Comparison between diesel and petrol engine - Difference between four and two stroke engine.
3. Terminology related to engine power - IHP, BHP, FHP, DBHP, compression ratio, stroke bore ratio, piston displacement, and mechanical efficiency – Numerical problems on calculation of IHP, BHP, C.R., stroke bore ratio, piston displacement volume.
4. Fuel supply and cooling system of I.C. engine – Types, components and their functions, working principle of forced circulation cooling system.
5. Ignition and power transmission system of I.C engine – Types, components and their functions, working principle of battery ignition system.

UNIT 2

1. Lubrication system of I.C. engine – Types, purpose, components and their functions, working principle of forced feed system - Tractors classification, types, points to be considered in selection of tractors, estimating the cost of operation of tractor power.
2. Tillage - Primary and secondary tillage - M.B. plough – Functions, constructional features, operational adjustments and maintenance.
3. Disc plough – Functions, constructional details, operational adjustments and maintenance.
4. Numerical problems on M.B. plough and disc plough.

UNIT 3

1. Harrows – Types, functions, operation of disc harrows - Cultivators – Rigid and spring loaded types - Puddlers, cage wheel, rotovators - Intercultural implements – Hoes and weeders for dry and wetland cultivation.
2. Sowing equipment - Seed cum fertilizer drills – Types, functions, types of metering mechanisms, functional components, calibration - Paddy transplanters.

3. Harvesting equipment – Sickles, self propelled reaper, alignment and registration - Combines, functions of combines.

UNIT 4

1. Plant protection equipment – Types of sprayers, constructional features of knapsack sprayer, hand compression sprayer, foot sprayer, rocker sprayer and power sprayer, care and maintenance of sprayers.
2. Dusters – Hand rotary and power operated dusters, care and maintenance of dusters.

UNIT 5

1. Tractor mounted equipments for land development and soil conservation – Functions of bund former, ridger, and leveling blade.
2. Threshing equipment and principles of combine harvester.

References:

a. Farm Power And Machinery Management. Donnel hunt. MEDTEC publications

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: Horticulture
2020-21 Admitted Batch
II Year Semester – IV
ON JOB TRAINING

Teaching Hours 2 **Credits 1**

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50

5. Model Question Paper (Sem-end, Exam)

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
Course Syllabus of core Subjects: Horticulture under CBCS w.e.f 2020-21
PRINCIPLES OF HORTICULTURE
I year Ist Semester
MODEL QUESTION PAPER

TIME:3 HOURS **MAXIMUM MARKS :75**

I. ANSWER ANY FIVE QUESTIONS **5 X 5 =25 M**

1. Define Horticulture write about divisions of horticulture with suitable examples. What is the scope and importance of horticulture?
2. What are the different Sexual and asexual plant propagation methods write about propagation by cuttings
3. What are the different methods of Budding
4. What are the points to be kept in mind while selecting site for the establishment of orchards.
5. Explain Juvenility and flower bud differentiation
6. Write about ornamental garden types
7. Explain the use of plant bio-regulators (PBR) in horticulture
8. Explain the method of fertigation and write its advantages and disadvantages.

II. ANSWERE ALL THE QUESTIONS 5x 10 = 50 M

1. a) Write about classification of Horticulture based on soil, climate and botanical classification. and also describe the Influence of environmental factors on horticultural crop production.

OR

b) What are the different aspects of Grafting and describe the different kinds of grafting.

2. a) Describe the Systems of planting in orchids and mention their merits and demerits.

OR

b. Write the principles and methods of training and pruning and describe Open center, closed center and modified leader systems their merits and demerits.

3 a) Write the definition of pruning, objectives of pruning, principles and methods of pruning of fruit crops.

OR

b) Describe the application of growth regulator, environmental methods and Cultivation Techniques

4. a) Describe the principles of lawn making

OR

b) Describe different kinds of vegetable gardens

5 a) Describe the different irrigation methods in horticulture

OR

b) Describe the different fertilizer application methods to horticultural crops

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
I YEAR, I SEMESTER 2020-2021
PRACTICAL PAPER TITLE: PRINCIPLES OF HORTICULTURE

MODEL PAPER

Time: 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY

Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
I Year Semester – I
MODEL QUESTION PAPER
INTRODUCTION TO SOIL SCIENCE

Time: 3 Hours **Maximum: 75 Marks**

SECTION – A

I. Answer any FIVE questions. Each question carries equal marks. (5x5M = 25M)

1. Define Soil? Why it is called OS natural body?
2. Discuss about the profile of the Soil.
3. What do you mean by soil texture and soil structure?
4. Write a note on soil Air and Soil water.
5. What do you mean by soil color? What was the impact of soil color on crop growth?
6. Define Soil Science and mention the importance of soil science knowledge.
7. What is Soil survey and dismiss about soil survey reports.
8. Write a note on classification of soil.

SECTION – B

Answer All the questions. Each question carries TEN marks (5x10M = 50M)

1. a) What do you mean the seep out of top soil? What were types of it.
   (OR)
   b) What is drainage? Write its types.
2. a) Write a detailed note on soil relations.
   (OR)
   b)What is ion? What do you mean by ionic exchanger? Discuss about cat ion exchange capacity.
3. a) Write an essay on soil organic matter? Its importance for flora & Fauna of soil.
   (OR)
   b)Write about the chemistry of soil? Discuss about bulk and practical density.
4. a) Write a note on Porosity of soil.
   OR
   b) Discuss about nitrogen transformation in detailed manner.
5. a) Scope and importance of soil sciences and how it helps for future agriculture.
   (OR)
   b) Write a note on sulfur transformation

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
I YEAR, I SEMESTER 2020-2021
PRACTICAL PAPER TITLE: INTRODUCTION TO SOIL SCIENCE

MODEL PAPER

Time : 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
I Year Semester – I
MODEL QUESTION PAPER
PRINCIPLES OF CROP PHYSIOLOGY

Time: 3 Hours Maximum: 75 Marks

SECTION – A

I. Answer any five questions 5 x 5 = 25 M

1. What is Water use efficiency and describe Factors affecting WUE.
2. What are the **e**ssential mineral elements and explain the Criteria of essentiality of mineral elements
3. Describe the Biological nitrogen fixation and the Free-living and symbiotic bacteria
4. Differentiate Growth respiration and maintenance respiration
5. What are flowering hormones and explain the terms Vernalization and mention importance of vernalization in agriculture.
6. Define Senescence and abscission .Explain Classification of senescence
7. Describe the physiological and biochemical changes that occur during senescence
8. What are the hormones used for Ripening induction and ripening inhibition – Use of hormones in increasing vase life of flowers.

II. Answer all the questions All questions carry equal marks 5 x 10 = 50 M

1. a) Explain the different metabolic changes during seed development?

OR

b) What is Transpiration? Explain about Water use efficiency of C3, C4 and CAM plants What is Water requirement / Transpiration ratio

2. a) Explain functional roles of N, P, K, S Ca and Mg Fe and Na, and also explain Deficiency symptoms of macro and micro nutrients.

OR

b) Explain the Reactions of photosynthesis and Cyclic and non-cyclic photophosphorylation

3. a) Explain about C3, C4 pathways and CAM pathway and their significance.

OR

b) Define Respiration and Energy balance. write about significance of respiration – Oxidative Pentose Phosphate Pathway (OPPP)

4. a) Explain the physiology of flowering, Photoperiodism and flowering and Importance of photoperiodism.

OR

b) Also explain Classification of plants based on photoperiodic responses

5. a) Explain the role of Plant growth regulators, Auxins and Gibberellins their mode of action and physiological roles and Commercial uses

OR

b) Explain the role of ABA, Its Occurrence, transport, biosynthesis, mode of action and physiological roles and Commercial uses

ADIKAVI NANNAYA UNIVERSITY
B.VOC: Horticulture
I YEAR, I SEMESTER 2020-2021
OJT (ON JOB TRAINING)

MODEL PAPER **Total Marks : 50**

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50

ADIKAVI NANNAYA UNIVERSITY

B Voc HORTICULTURE
I YEAR II SEMESTER 2020-2021

PLANT PROPAGATION & NURSEY MANAGEMENT

Model Question Paper

Max.Time:3 Hours **Max. Marks:75**

I. ANSWER ANY FIVE QUESTIONS **5 x 5 =25 M**

1. What is Sexual propagation and write its advantages and disadvantages
2. Describe Polyembryony in propagation of Opuntia, trifoliate orange, mango and Citrus.
3. Write how to raise nursery by using bulbs, corms, tubers and rhizomes.
4. Write how to raise nursery by Stolons, runners and offsets.
5 Describe the propagation by root, leaf and stem cuttings
6 Define Plant nursery and write its importance
7 What are the basic facilities for a nursery, layout and components of a good nursery
8 What are the common possible errors in nursery activities?

II Answer all the question **5 x 10=50M**

1. a) What is the Seed germination? Explain the process of seed germination and factors affecting seed germination:

OR

b) Write about Pre-germination treatments and viability tests, sowing methods of seeds.

2. a) Write about Asexual propagation and its advantages and disadvantages.

OR

b) Define Apomixis: and describe the role of apomictics in plant propagation.

3. a) Define Layering Explain the techniques of simple serpentine, mound, trench and air Layerings

OR

b) Define Grafting and explain approach and detached scion (Veneer, whip, cleft, side and bark grafting techniques.

4 a) What is Budding technique and Explain techniques of soft-, patch and chip budding

OR

b) Describe Different types of Nursery beds and , their merits and demerits, and precautions to be taken during preparation

5. a) Give a Brief be count of growing medium nursery tools and implements.

OR

b) Give a brief account of plant propagation structures,

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
I YEAR, II SEMESTER 2020-2021
PRACTICAL PAPER TITLE: PLANT PROPAGATION & NURSEY MANAGEMENT

MODEL PAPER

Time : 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
I Year – II Semester
MODEL QUESTION PAPER
PRINCIPLES OF PLANT BREEDING

Time: 3 Hours Maximum: 75 Marks

SECTION –A

Answer any FIVE questions. Each carries equal marks. (5x5M=25M)

1. Merits and demerits of plant introduction.
2. Define multiline concept and Characters of good multiline.
3. What is major aim and objectives of plant breeding.
4. What is mutation breeding and procedures of mutation breeding?
5. Explain horizontal and vertical resistance.
6. Compare the difference between dominance and over dominance hypotheses.
7. Compare the difference between pedigree and bulk method.
8. Define hybridization and steps involved in hybridization.

SECTION –B

Answer All the questions. Each question carries TEN marks 5x10M= 50M)

1. A)what is polyploidy breeding explain their origin and application in crop improvement

   (Or)

   B) Write about morphological and cytological features of allopolyploidy.
2. A) What are the merits and demerits of composite and synthetic varieties.

   (Or)

   B) What are the steps involved in production of single and double cross hybrids.

3. A) Explain mechanism of drought resistance and features associated with drought resistance.

   (Or)

   B) Write the procedure of mutation breeding, what are the disadvantages and advantages of mutation breeding.
4. A) Define inbreeding depression. What are procedures involved in development of inbred lines.

   (Or)

   B) Define self-incompatibility and its classification
5. A) What is male sterility, Write about genetic consequences of male sterility.

   (Or)

   B) What are the factors effecting Hardy- Weinberg law.

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
I YEAR, II SEMESTER 2020-2021
PRACTICAL PAPER TITLE: PRINCIPLES OF PLANT BREEDING

MODEL PAPER

Time : 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
I Year Semester – II
MODEL QUESTION PAPER
VEGETABLE SCIENCE

Time: 3 Hours Maximum: 75 Marks

SECTION – A

I. Answer any five questions 5 x 5 = 25 M

1. Explain the role of vegetables in Human Health
2. What are the different types of vegetable markets are present?
3. Write about the cold storage facilities for the Vegetables .
4. Write the seed bed preparation of the nursery for vegetables
5. Write the medicinal value of the four vegetables
6. Write the vegetables that are used for salad purpose
7. What are the vegetables used for the post harvest keeping of the vegetables
8. What are the vegetables that have higher medicinal value

II. ANSWER ALL QUESTIONS 5 X 10 = 50 M

1. A). Define Olericulture. Explain the importance of the vegetables in daily needs of the human beings and its role in Indian Economy

OR

B)

2. A) Vegetables are perishable commodity. How the marketing facilities should be arranged and what strategy about storage and marketing should be

OR

B)

3. A) Describe different types of classification of the vegetables

OR

B)

4. A) Write down the different nursery requirements of the vegetables.

OR

B)

5. A) Write in details the package of practices of producing any six vegetables given below

1.Cucurbits 2. Cabbage and Cauliflower 3. Onion.4. Carrot 5. Tubers

OR

B) Write in details the package of practices of producing any six vegetables given below
1.Tomato 2. Brinjal3.Bhendi 4. Beans (Cluster And French) 5. Chilli and Capsicum

ADIKAVI NANNAYA UNIVERSITY
B.VOC: Horticulture
Semester-II 2020-2021
OJT (ON JOB TRAINING)

MODEL PAPER **Total Marks : 50**

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
II Year – III Semester
PRODUCTION TECHNOLOGY OF FRUIT & FLOWER SCIENCE

MODEL QUESTION PAPER

Maximum Time: 3 Hours **Maximum Marks:75**

I ANSWER ANY FIVE OF THE FOLLOWING **5x5M=25M**

1. Explain the Role of fruit crops in Health and national economy,
2. What are the different methods of Propagation of Fruit crops? Mention merits and demerits.
3. Discuss various planting density and systems of planting
4. What is training and pruning and write its advantages and disadvantages
5. Explain about the maturity indices and harvest.
6. Explain about the Classification of flower crops
7. What is Pinching and Write its merits and demerits
8. Explain the production technology of Cut flowers

II, ANSWER ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS. 5X10=50M

1. a) Explain the procedures of different methods of cutting, layering, grafting and budding.

OR

b) Explain the classification of fruit crops based on area, production, productivity and export potential.

2. a) What is Fertigation and Write its advantages and disadvantages and also explain about the Plant growth regulators

OR

b) What are the important disorders in fruit crops Explain with examples?

3. a**)** Explain about the post-harvest management of Sapota, pomegranate and Guava

OR

b**)** Explain about the post-harvest management of Pineapple, Apple, and Jack .

4. a) Explain about the **d**omestic and export potential of commercial flowers

OR

b) Describe the protected cultivation methods of cultivating high value flower crops.

5. a) describe the export standards of loose and cut flowers and discuss the flower arrangement methods

OR

b) Describe the production technology of tropical orchids including varieties, harvest and post Harvest management practices

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
II YEAR, III SEMESTER 2020-2021
PRACTICAL PAPER TITLE: PRODUCTION TECHNOLOGY OF FRUIT & FLOWER SCIENCE

MODEL PAPER

Time: 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY
Bachelor of Vocation: HORTICULTURE
2020-21 Admitted Batch
II Year Semester – III
MODEL QUESTION PAPER
PRODUCTION TECHNOLOGY OF SPICES & PLANTATION CROPS

Time: 3 Hours Maximum: 75 Marks

SECTION –A

I. Answer any FIVE questions. Each carries equal marks. (5x5M=25M)

1. Explain the different kinds of classification of Spices and plantation crops
2. Explain in brief the medicinal values of these plant products Viz., Cardamom, Black pepper, Beetle vine, Ginger and Turmeric
3. Describe the production technology of Saffron and its uses
4. Write the composition and industrial importance of products, bi products and their utilization of cocoa, coconut , cashew nut
5. Describe the production technology of Cashew nut
6. Describe the production technology of Rubber
7. Explain the close planting (Dense planting) of plantation crops and its advantages and disadvantages
8. What is the scope of increasing the area of plantation crops under organic farming?

II. ANSWERE ALL THE QUESTIONS 5 X 10 =50 M

1. A) Explain the Role of Spice Board and the salient achievements of institutional research centers working on spices

OR

B) Explain the Role of exports promotion council

2. A) Describe briefly the scope, importance, export potential of plantation crops

OR

B) Plantation crops role in National and state economy

3. A) Explain in brief the production technology of the following

a. Clove b. Cinnamon

OR

B) Explain in brief the production technology of the following

a. Coriander b. Fenu Greek

4. A) Explain in brief Production technology of the following plantation crops

a. Coconut b. Oil Palm

OR

B) Explain in brief Production technology of the following plantation crops

a. Areka nut b. Almond

5. A) Explain in brief Production technology of the following plantation crops

a. COFFEE b. TEA

OR

B) Explain in brief Production technology of the following plantation crops

a. DATE PALM b. RUBBER

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
II YEAR, III SEMESTER 2020-2021
PRACTICAL PAPER TITLE: PRODUCTION TECHNOLOGY OF SPICES & PLANTATION CROPS

MODEL PAPER

Time : 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY

Bachelor of vocation: HORTICULTURE

2020 -21 ADMITTED BATCH

II Year Semester – III

MODEL QUESTION PAPER

AGRICULTURE ECONOMICS & FARM MANAGEMENT

Max. Time: 3 Hours **Max.Marks:75**

SECTION – A

Answer any FIVE Questions. Each carries equal Marks **5X5=25M**

1. Define Economics, Macro Economics and Micro Economics?
2. What is Demand? Explain about The Types of Demand?
3. What is Elastic and Inelastic Demand? Explain The Types of Elasticity of Demand?
4. Explain Increasing, Decreasing, constant Law of Return? With Examples?
5. Write the definitions of Monopoly, Duopoly, Monopoly Duopoly and oligopoly With Examples?
6. Define inflation and deflation? Explain Demand pull and cost push Inflation?
7. What is the Meaning of Economic system? Explain about the types of Economic systems
8. What is Economic Planning? Discuss the Importance and Elements of economic planning?

SECTION – B

Answer the all questions. Each carry ten marks **5X10=50M**

1. a) Write a detailed note on Law of Diminishing Marginal and statement, assumption and limitation

OR

(b)Explain Law of Equi Marginal utility, importance, assumption and limitation?

2. (a)Explain the different kinds of elasticity of demand? and their affecting factors?

OR

(b)What is the Prediction Process? Explain factor of Production

3. (a)What is Elasticity of supply? Explain kinds of Elasticity of supply?

OR

(b) Explain differences between public finance and private finance?

4. (a)What is canon of taxation? And explain Adam Smith s and other canons of taxation ?

OR

(b)What is per Capital Income ?And Explain the different compacts included in the National Income And Explain the different compacts included in the National Income

5. (a). Write the Meaning of capitalism, Socialism and Mixed Economics? And its Characteristic features

OR

(b) Explain the Annual Plans and Five Year Plans and Its Objectives and explain NITI Aayog?

ADIKAVI NANNAYA UNIVERSITY
B.VOC: Horticulture
Semester-III 2020-2021
OJT (ON JOB TRAINING)

MODEL PAPER **Total Marks : 50**

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50

ADIKAVI NANNAYA UNIVERSITY
Bachelor of vocation: HORTICULTURE
2020 -21 ADMITTED BATCH
II Year Semester – IV

MODEL QUESTION PAPER
PRINCIPLES OF ORGANIC FARMING

MAXIMUM TIME: 3 HOURS **MAXIMUM MARKS:75**

SECTION – A

I. Answer any FIVE Questions .Each carries equal Marks 5X5=25

1. Define organic farming. What are the main principles and characteristics? Mention the relevance to modern agriculture
2. What are the organic nutrient sources?
3. Describe organic manures and methods of composting
4. Explain the concept of multiple cropping and its need and benefits
5. Write about operational structure of NPOP
6. What are the economic considerations and viability of organic farming
7. Explain about the processing of organic products
8. What is the impact of organic farming on National economy

SECTION –B

II. Answer all the questions 5 x 10 =50 M

1. a) Describe the different eco friendly farming systems biological farming, natural farming, regenerative agriculture – perm culture - biodynamic farming

OR

b) Explain relevance of organic farming to A.P, India, and global agriculture. Write future Prospects, advantages and barriers.

2. a) Explain the role of green manures and bio fertilizers in organic farming. Mention benefits and limitations.

OR

b) Explain the nutrient use in organic farming, its scope and limitations.

3. a) Write about Nutrient management in organic farming.

OR

b) describe organic ecosystem and their concepts.

4. a) explain about choice of crops and varieties and crop rotations in organic farming.

OR

b) write about different Botanical formulations used in organic farming.

5. a) Write about Inspection, certification, labeling and accreditation procedures for organic products

OR

b) Explain the marketing and export potential of organic products

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
I YEAR, IV SEMESTER 2020-2021
PRACTICAL PAPER TITLE: PRINCIPLES OF ORGANIC FARMING

MODEL PAPER

Time : 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY

Bachelor of vocation: HORTICULTURE

2020 -21 ADMITTED BATCH

II Year – IV Semester

DISEASES OF HORTICULTURAL CROPS AND THEIR MANAGEMENT

MODEL QUESTION PAPER

Ax. Time: 3 Hours **Max Marks :75**

SECTION – A

I. **Answer any FIVE Questions .Each carries equal Marks** **5X5=25**

1. What is the study of etiology, symptoms and host-parasite relationship in disease management?
2. How do you identify fruit rot, bacterial wilt and little leaf of Brinjal? How to control the same diseases?
3. Explain the important diseases of Okra and their control measures.
4. Write about the diseases of Tea and Coffee along with control measures.
5. How do you identify the Rhizome rot of Ginger and turmeric? How do you control the same
6. Write the control measures of Phytophthora root and stem rot of Betel vine
7. Write the diseases of Onion and garlic along with control measures
8. Explain about the: Phytophthora blight of Colocasia and stem gall of Coriander and write their control measures

II. Answer all the Questions **5 x 10 = 50M**

1. a) Describe the important diseases of Guava and Papaya and also write the remedial Measures.

   OR

   b) Describe the important diseases of Ber and Sapota and also write the remedial Measures.
2. a) Write about Banana and Pomegranate diseases and propose control measures

   OR

   b) Write about any three important Grapevine diseases and control measures
3. a) Write about Apple and Peach diseases along with control measures

   OR

   b) Write about any four diseases of Chilies and control measures
4. a) What are the four yield damaging diseases of Potato and their control measures?

   OR

   b) What are the four yield damaging diseases of Tomato and their control measures
5. Describe two the most notorious diseases of Coconut and how they were controlled?

   OR

   b) Write about at least one disease each of Rose, Marigold, Chrysanthemum and Jasmine and also mention their control measures

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
I YEAR, IV SEMESTER 2020-2021
PRACTICAL PAPER TITLE: DISEASES OF HORTICULTURAL CROPS AND THEIR MANAGEMENT

MODEL PAPER

Time : 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY

Bachelor of vocation: HORTICULTURE

2020 -21 ADMITTED BATCH

II Year – IV Semester

PESTS OF HORTICULTURAL CROPS AND THEIR MANAGEMENT

MODEL QUESTION PAPER

Ax. Time: 3 Hours **Max Marks:75**

SECTION – A

I. **Answer any FIVE Questions .Each carries equal Marks** **5X5=25**

1. What is meant by ETLs and write its merits and demerits
2. Write about common Parasites and predators of important insect pests
3. Write the important pests of brinjal and their control measures
4. Write about the pests of Mango along with control measures and IPMpractices
5. Write about the pests of Citrus along with control measures and IPMpractices
6. Explain the damage symptoms of Tree borer, tea mosquito bug and leaf miner of Cashew and suggest the control measures
7. Explain the damage symptoms of - Rhizome weevil, skipper, and pseudo stem weevil of Banana . and explain control measures
8. Apple - Woolly aphid and Codling moth - Custard apple- Mealybug - IPM practices

II. **ANSWER ALL QUESTIONS** **5 x 10= 50 M**

1. a) Elaborate in detail the Integrated Pest Management practices and write its advantages and disadvantages

OR

b) Elaborate the calculations of dosage of pesticides, spraying methods and precautions to be taken during spraying chemicals.

2. a) Describe the important pests of Grapevine and mention control measures and IPM practices.

OR

b) Write important pests of Coconut and explain the IPM practices.

3. a) Write important pests of Coconut and explain the Control measures and IPM practices

OR

b) Write important pests of arecanut and - Eucalyptus and explain the Control measures and IPM practices

4. a) Write the important pests of Neem, control measures and IPM practices

OR

b) What are the beneficial insects and how they are useful for farmers

5. a) Describe the rearing methods of silkworm and lac and how to obtain silk and lac

OR

b) Describe in detail about the rearing of Honey bees and extraction Honey

ADIKAVI NANNAYA UNIVERISTY

B.VOC. HORTICULTURE
I YEAR, IV SEMESTER 2020-2021
PRACTICAL PAPER TITLE: PESTS OF HORTICULTURAL CROPS AND THEIR MANAGEMENT

MODEL PAPER

Time : 3 Hrs **MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

ADIKAVI NANNAYA UNIVERSITY
B Voc HORTICULTURE
Detail Course wise syllabus (Core Discipline Courses)
From 2020-21 Admitted Batch
II Year –IV Semester
FARM POWER AND MACHENERY
MODEL QUESTION PAPER

MAX MARKS 75 **TIME: 3 HOURS**

I. Answer any five questions **5x5 =25 M**

1. What are the different Source of different farm power, advantages and disadvantages?
2. Explain about Fuel supply and cooling system of I.C. engine
3. What are the different types of tractors and points to be considered in selection of tractors?
4. Describe the Seed cum fertilizer drill and its advantages
5. Describe the mechanism or functioning of Paddy transplanters
6. Explain briefly about the functioning and advantages of combine harvesters of different crops
7. What are power tillers and what is the difference between tractor and power tiller?
8. What are the advantages of battery operated sprayers over traditional sprayers

II. Answer all the questions **5x10 =50 M**

1. A) Explain the principle of four stroke and two stroke cycle engine and Compare between diesel and petrol engine

OR

B) Explain about Ignition and power transmission system of I.C engine

2 . a) Explain briefly about Tillage - Primary and secondary tillage

OR

b) Explain about the differences between functions of M.B. plough and Disc plough

3 a) Write about different types of Harrows and operation of disc harrows

OR

b) write about Puddlers, cage wheel, and rotovators - Hoes and weeders for dry and wetland cultivation.

4 a) describe about different Plant protection equipment –

OR

b) Describe about power sprayer, care and maintenance of sprayers.

5. a) Briefly describe Functions of bund former, ridger, and leveling blade.

OR

b) Briefly describe Threshing equipment and principles of combine harvester.

ADIKAVI NANNAYA UNIVERSITY
B.VOC: Horticulture
Semester-IV 2020-2021
OJT (ON JOB TRAINING)

MODEL PAPER **Total Marks : 50**

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50