

Ref.: SU/BOS/Voc./508

Date: 10-09-2024

To, The Principals, All Concerned Affiliated Colleges /Institutions. Shivaji University, Kolhapur.

Subject : Regarding syllabi of B. Voc. Part III Courses under the Faculty of Inter-Disciplinary Studies as per National Education Policy, 2020. (1.0)

Sir/Madam,

With reference to the subject, mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabii of B.Voc. Part III Courses under the Faculty of Inter-Disciplinary Studies. as per National Education Policy, 2020. (1.0)

1	B.Voc. in Tourism and Service Industry
2	B.Voc. in Sustainable Agriculture Management
3	B.Voc. in Nutrition and Dietetics
4	B.Voc. in Nursing and Hospital Management
5	B.Voc. in Building Technology & Interior Design
6	B.Voc. in Agriculture
7	B.Voc. in Printing & Publishing
8	B.Voc. in Sustainable Agriculture
9	B.Voc. in Graphic Design
10	B.Voc. in Automobile

This syllabi shall be implemented from the academic year 2024-2025 onwards. A soft copy containing the syllabi is attached herewith and it is also available on university website www.unishivaji.ac.in. (NEP-2020@suk / Online Syllabus)

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours Faithfully S. M. Kubal) **Dy Registrar**

Copy to:

y 10:			
1	The Dean, Faculty of IDS	6	Affiliation T. 1 & T. 2 Section
2	Director, Board of Examination and Evaluation	7	P.G.Admission Section
3	The Chairman, Respective Board of Studies	8	Appointment A & B Section
4	All On Exam Section O'E' I Section	9	P.G.Seminar Section
5	Eligibility Section	10	Computer Centre /I.T.cell

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SHIVAJI UNIVERSITY,

KOLHAPUR



Accredited By NAAC with 'A++' Grade

National Education Policy (NEP-2020) Faculty of Interdisciplinary studies Structure, Scheme and Syllabus for Third Year Bachelor of Vocation (B. Voc.- Degree) Course Structure for (Level-7) With Multiple Entry and Multiple Exit Option.

Sustainable Agriculture Management- Part- III Semester- V and VI

(Subject to the modifications that will be made from time to time) (To be implemented from Academic Year- June, 2024-25 onwards)

National Education Policy(NEP-2020)

Third Year Bachelor of Vocation (B. Voc.- Degree) Course Structure for (Level-7)

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	T	- 1	Calca	Se	mester v	– Durati	on: 6 Month	15 	1		
	lea	cning	Schei	me			Evalu	lation Sc	neme	-	
Sr. No.	Course	N Lec T	o. of tures P	Hours (T + P)	Credits	Theory	Internal/ Practical	Total Marks	Min Marks (Separate passing)	Ex Dura (Hi T	am ation rs.) P
1.	AECC-E	4	-	6	4	40	10	50	18	2	-
2.	GEC –E	4	2	6	4	40	10	50	18	2	-
3.	DSC –E-I	4	-	4	4	50	-	50	18	2	-
4.	DSC –E-II	4	-	4	4	50	-	50	18	2	-
5.	DSC –E-III	4	-	4	4	50	-	50	18	2	-
6.	SEC-E-I	-	4	4	2	-	50	50	18	-	3
7.	SEC-E-II	-	4	4	2	-	50	50	18	-	3
8.	SEC-E-III	-	4	4	2	-	50	50	18	-	3
9.	SEC-E-IV	-	-	2	2	-	50	50	18	-	-
	Total	20	14	36	28	230	220	450	-		-

With Multiple Entry and Multiple Exit option. (To be implemented from the Academic Year 2024-25)

	Semester VI – Duration: 6 Months										
	Tea	Sche	me		Evaluation Scheme						
Sr. No.	Course	No Lect T	. of tures P	Hours (T + P)	Credits	Theory	Internal/ Practical	Total Marks	Min Marks (Separate passing)	Ex Dura (Hi T	am ation rs.) P
1.	AECC-F	4	-	6	4	40	10	50	18	2	-
2.	GEC –F	4	2	6	4	40	10	50	18	2	-
3.	DSC –F-I	4	-	4	4	50	-	50	18	2	-
4.	DSC –F-II	4	-	4	4	50	-	50	18	2	-
5.	DSC –F-III	4	-	4	4	50	-	50	18	2	-
6.	SEC-F-I	-	4	4	2	-	50	50	18	-	3
7.	SEC-F-II	-	4	4	2	-	50	50	18	-	3
8.	SEC-F-III	_	4	4	2	-	50	50	18	-	3
9.	SEC-F-IV	-	-	2	2	-	50	50	18	-	-
	Total	20	14	36	28	230	220	450	-		

- Student Contact Hrs Per week: 36 hrs
 Total marks for B.Voc.- Degree: 900
- Theory and Practical Lectures: 48 Minutes Each

• Total credits for B.Voc.- Degree: 56

- AECC: Ability Enhancement Compulsory Course (Compulsory English)
- Practical workload will for batch of 20 students
- Practical Examination will be conducted Semester wise for 50 Marks per course (subject).
- DSC: Discipline Specific Core Course Candidate can opt three courses (Subjects) from DSC.
- GEC: Generic Elective Compulsory Course Candidate can opt any one course (Subject).
- There shall be separate passing for theory and practical courses.
- AECC & GEC Internal Evaluation should be done at college or respective departmental level
- SEC-E & SEC-F are two parts of Vocational Degree Course

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Eligibility for Admission: Advance Diploma

Eligibility for Faculty:1) Post Graduate with NET / SET/Ph. D. in Agriculture / Agriculture
Engineering / Agri-business Management / Botany Or
2) Five Year Industry Experienced Personal
3) M. A. (English) with NET/SET/ Ph.D. for Business Communication
in EnglishEligibility for Lab Assistant: Graduation with related field
Staffing Pattern: Teaching:In the 1st year of B. Voc. – One Full Time and
one C. H. B. for Business CommunicationLab. Assistant:For 1st Year of B. Voc.- 1 Part Time

For 2nd and 3rd Year (Inclusive of 1st Year) of B. Voc. – 1 Full Time

(AECC-ED) Paper – I: Business Communication in English -III Paper No: XXXVII. Credits: 04 Theory: 4 lectures/week Total Marks: 50 (Theory- 40 + Internal- 10) _____ _____ Units Prescribed for Theory: 40 Marks. **Course Outcomes:** The students will acquire knowledge of 1. To develop awareness of the complexity of the communication process 2. To develop effective listening skills in students so as to enable them to comprehend instructions and become a critical listener 3. To develop effective oral skills so as to enable students to speak confidently interpersonally as well as in large groups 4. To develop effective writing skills so as enable students to write in a clear, concise, persuasive and audience centered manner 5. To develop ability to communicate effectively with the help of electronic media **Content of syllabus: Unit–I: Concept of Communication** (15 Hrs.) Meaning, Definition, Process, Need, Feedback, Emergence of Communication as a key concept in the Corporate and Global world Unit - II Impact of technological advancements on Communication (15 Hrs.) Types- Internet, Blogs, E-mails, Moodle, Social media (Facebook, Tweeter & WhatsApp) Advantages and Disadvantages Unit - III Problems in Communication (15 Hrs.) Physical/ Semantic/Language / Socio-Cultural / Psychological / Barriers Ways to Overcome these Barriers **Unit – IV Listening Skills** (15 Hrs.) Importance of Listening Skills, Obstacles to listening, cultivating good Listening Skills **Practical: Based on the theory units:** Marks: 10 **Books Recommended: (List of Minimum 5 Books)** Agarwal, Anju D (1989) A Practical Handbook for Consumers, IBH. Alien, R.K. (1970) Organizational Management through Communication. Ashley, A (1992) A Handbook of Commercial Correspondence, Oxford University Press. Aswal thapa, K (1991) Organizational Behavior, Himalayan Publication, Mumbai.

Bachelor of Vocation (B. Voc.) Part III - Sem. V

Atreya N and Guha (1994) Effective Credit Management, MMC School of Management, Mumbai. Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%. (2. Students can use scientific calculators in theory examination.)

Pattern of a Question Paper B. Voc. Part-III Semester –V

Business Communication in English -III (AECC-E)

Paper No: XXXVII

Time: 2 hours	Total Marks: 40
 Q.1 Do as directed questions items on unit 1 to be asked Q.2 Write a letter of application OR 	10 (10 out of 12) 10
Draft a CV / Resume for a particular post	10
Q.3 Present a given information or a data using a table/ chart/pie diagram etc.(any one diagram to be drawn)	n, 10
Q.4 Fill in the blanks in the given interview	10
Practical Evaluation: Oral and presentation based on units prescribed	10 Marks

Paper No Theory: • Practical	Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Generic Elective Compulsory Course (GEC– E) Paper Title: Green Technology and Sustainable Development o: XXXVIII Credits: 04 4 lectures/week Total Marks: 50 (Theory 40 + Internal 10) l: 2 Lectures/Week/Batch	
Course C	Dutcomes: The students will acquire knowledge of -	
1. To pres	sent different concepts of green technologies.	
2. Princip	ples of Energy efficient technologies.	
3. Import	ance of green fuels and its impact on environment.	
4. Nation	al policies of green development.	
5. Produc	ction of biofuels.	
UNIT 1:	Impact and Introduction of Green Technology.	(15 Hrs.)
1.1	Definition, Importance, Impact on promoting green technology.	
1.2	Need, Aim, scope, Goal of green technology.	
1.3	Limitation of green technology.	
1.4	Principles of Green Technology.	
UNIT 2:	Biogas and Biofuel.	(15 Hrs.)
2.1	Classification of biofuels, liquid and gaseous.	
2.2	Application to the production of biogas from waste & solid substrates.	
2.3	Cattle manure, municipal organic waste, sewage sludge.	
2.4	Processes for the production of liquid biofuels.	
UNIT 3:	Energy Sources.	(15 Hrs.)
3.1	Conventional and Non-conventional energy sources.	
3.2	Solar Energy-solar energy conversion technologies and devices, their principles, and	nd
	application.	
3.3	Commercial energy sources.	
3.4	Major environmental problems related to the conventional and non- conventional	
	energy resources.	
UNIT 4:	National Policies of Green Technology.	(15 Hrs.)
4.1	National policies for green development.	
4.2	Draft National Energy Policy, Government of India.	
4.3	Environment policy of India.	
4.4	Green growth development agenda.	

Reference Books Recommended:

- 1. Green Technologies Soli J. Arceivala, Mc Graw Hill Education.
- 2. Handbook of Organic Waste Conversion Bewik M.W.M.
- 3. Non-conventional Energy Sources Rai G.D.
- 4. Waste Energy Utilization Technology Kiang Y. H.
- 5. Energy- The Solar Hydrogen Alternative- Bokris J.O.
- 6. Biogas technology transfer & diffusion –M.M. El Halwagi.
- The Biogas Handbook: Science, Production and Applications Wellinger, J. D Murphy, D. Baxter.

Note: (If any - such as

- (1. In theory examination, the weightage to numerical problems should not exceed 30%.
- 2. Students can use scientific calculators in theory examination.)

Pattern of Question Paper Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Generic Elective Compulsory Course (GEC– E) Paper Title: Green Technology & Sustainable Development

Time: 2 hours

Total Marks: 40

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Q.1	Multiple Choice Questions- 10	10
Q.2	Attempt any TWO of the following.	10
	a.	
	b.	
	с.	
	d.	
Q.3	Write in Brief any TWO of the following.	10
	a.	
	b.	
	С.	
	d.	
Q.4	Write Short Notes on One of the following	10
	a.	
7	b.	

Practical Evaluation: 10 Marks

Oral and Presentation based on the units prescribe

Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Discipline Specific Core Course (DSC– E-I) Paper Title: Farm Power and Machinery Credits: 04

Paper No: XXXIX Theory: 4 lectures/week

Total Marks: 50 (Theory)

(15 Hrs.)

(15 Hrs.)

(15 Hrs.)

Course Outcomes: The students will acquire knowledge of

- 1. To acquaint and equip with the latest design procedures of farm power and machinery systems.
- 2. To acquaint with principles of farm machineries and their working.
- 3. To equip the students with sufficient theoretical knowledge about machinery.
- 4. Sufficient practical skills about farm power and tractor power.
- 5. Sowing, Planting techniques by using Equipments.

Unit 1: Farm Power and Tractors:

- 1.1Farm power in India sources, IC engines
- 1.2 Working principles, two stoke and four stoke engines, IC engine terminology, and different systems of IC engine
- 1.3 Tractors types and utilities.

Unit 2: Tillage and Tillage Machinery:

- 2.1 Tillage ploughing methods primary tillage implements.
- 2.2 Mould board, disc plough and chisel plough.
- 2.3 Secondary tillage implements cultivators, harrows and rotovators
- 2.4 Wetland equipment peddlers, tramplers and cage wheels.

Unit 3: Sowing, Planting and Intercultural Equipment:

- 3.1 Sowing methods. Seed drills, seed cum fertilizer drills. Paddy transplanters nursery requirements.
- 3.2 Implements for intercultural operations. Wet land, dry land and garden land intercultural tools
- 3.3 Equipment for land development and soil conservation. Cost of operation of farm machinery. Tractor and implement selection.

Unit 4: Plant Protection Gadgets, Harvesting Machinery and Horticulture Tools: (15 Hrs.)

- 4.1 Plant protection equipment.
- 4.2 Harvesting tools and equipment reapers and combine.
- 4.3 Harvesting machinery for groundnut, tuber crops and sugarcane.
- 4.4 Tools for horticultural crops.

Reference Books Recommended:

- 1. A Text Book of Farm Machinery- Senthilkumar, T., R. Kavitha and V.M. Duraisamy.
- 2. Elements of Agricultural Engineering Jagadishwar Sahay.
- 3. Principles of Agricultural Engineering Vol I- Ojha, T.P and A.M. Michael.
- 4. Farm Machinery and Equipment: Nakra C.P 1970.

5. Elements Of Farm Machinery - Sricastava, A.C.

www.agricoop.nic.in/dacdivision/Machinery/directory.htm www.farmmachineryshow.org

Note: (If any - such as

- (1. In theory examination, the weightage to numerical problems should not exceed 30%.
- 2. Students can use scientific calculators in theory examination.)

Pattern of Question Paper- for DSC- E- I, II & III Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Discipline Specific Core Course (DSC– E-I) Paper Title: Farm Power and Machinery

Time: 2 hours

Total Marks: 50

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Q.1	Multiple Choice Questions-10	10
Q.2	Attempt any TWO of the following.	20
	а.	
	b.	
	с.	
Q.3	Attempt any FOUR of the following.	20
	a.	
	b.	
	с.	
	d.	
	е.	
	f.	

Bachelor of Vocation (B. Voc.) Part- III – Semester- V **Sustainable Agriculture Management Discipline Specific Core Course (DSC-E-II)** Paper Title: Plant Breeding.

Paper No Theory: 4	: XL lectures/week	Credits: 04 Total Marks: 50 (Theory)	
Course O	utcomes: The students will acquire knowledge	ge of	
1. To deve	elop varieties with better characteristics in hig	her yield.	
2. To deve	elop varieties with Disease resistance, Flood r	esistance.	
3. Breedin	ng methods, pollination and Hybridization tech	hniques.	
4. To deve	elop varieties with better characteristics in Ear	ly to mature.	
5. To deve	elop Resistance to alkaline and saline soil con	ditions, better quality, Drought resistance.	
UNIT 1:	Plant Breeding	(15 Hrs.)
1.1	Definition, history of plant breeding, aims an	nd general objective of plant breeding	
1.2	Land marks of plant breeding		
1.3	Indian plant breeders		
1.4	General objectives of plant breeding, major	achievements, Future Prospects	
UNIT 2:	Self-incompatibility, Male sterility		(15 Hrs.)
2.1	Definition, classification		× /
2.2	Features, utilization of self-incompatibility	in plant breeding	
2.3	Definition, Classification/types, Genetic MS	S, Thermo sensitive Genetic MS.	
2.4	Chemical Hybridizing Agents		
UNIT 3:	Breeding Methods		(15 Hrs.)
3.1	Breeding Methods in self-pollinated crops.		× ,
3.2	Definition, purpose, types, primary and seco	ondary, advantages & disadvantages	
3.3	Breeding in cross pollinated crops, its types	and its procedure.	
3.4	Hybridization techniques- Definition, aim a	nd objectives, types of hybridization.	
UNIT 4:	Mutation and Heterosis		(15 Hrs.)
4.1	Definition of mutation breeding, application	ns, its merits, demerits and achievements.	()
4.2	Definition of haploid, monoploid, diploid, r	oolyploid, genome, heteroploidy,	
	aneuploidy, euploidy, types of aneuploidy		
4.3	Definition, heterosis and hybrid vigour, effe	ects and estimation of heterosis, genetic	
	basis/theories of heterosis	-	
Reference	e Books Recommended:		

- 1. Plant Breeding Principles and Methods B. D. Singh.
- 2. Essentials of Plant Breeding Phundansingh Kalyani.
- 3. Principles and Practices Plant Breeding-J. R. Sharma.
- 4. Plant Breeding Theory and Practices V. L. Chopra.
- 5. Introduction to Plant Breeding R. C. Choudhary.
- 6. Elementary Principles of Plant Breeding- R. C. Choudhary.

Note: (If any - such as

- (1. In theory examination, the weightage to numerical problems should not exceed 30%.
- 2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Discipline Specific Core Course (DSC– E-III) Paper Title: Vegetable Crop Production Credits: 04

Paper No: XLI. Theory: 4 lectures/week

 Theory: 4 lectures/week
 Total Marks: 50 (Theory)

Course Outcomes: The students will acquire knowledge of

1. Demonstrate proficiency in the cultural and management considerations of successful sustainable vegetable crops production.

(15 Hrs.)

(15 Hrs.)

(15 Hrs.)

- 2. To prepare students to successfully grow vegetables for commercial vegetable production.
- 3. Be familiar with vegetable crops environmental modification.
- 4. Be familiar with successful vegetable crops harvest and marketing.
- 5. Greenhouse Vegetables.

UNIT 1: Vegetable

- 1.1 Introduction to Vegetable Industry
- 1.2 Vegetable Growing Principles
- 1.3 Greenhouse Vegetables
- 1.4 Root & Tuberous Crops: Sweet Potato & Irish Potato

UNIT 2: Vegetable crops (15 Hrs.)

- 2.1 Solanaceous Crops
- 2.2 Root Crops- Onions and Allium species
- 2.3 Cole Crops- Cucumber and Cucurbit Vegetables

UNIT 3: Vegetable Management

- 3.1 In brief -origin, area, production, improved varieties.
- 3.2 Cultivation practices such as time of sowing, sowing, transplanting techniques, planting distance
- 3.3 fertilizer requirements, irrigation, weed management, harvesting, storage, disease and pest control.

UNIT 4: Vegetable Marketing.

- 4.1 Post Harvest Handling
- 4.2 Direct Marketing Farmers Markets; Local / Community Food Programs
- 4.3 Mult storied cropping
- 4.4 Seed production of important vegetables

Reference Books Recommended:

1 Vegetables B. Choudhary

- 2 Vegetable Crops T. K. Bose, M. G. Som and T. Kabir
- 3 Vegetable, Tuber and Spices S.Thamburaj
- 4 Production technology of vegetable crops S. P. Singh
- 5 Vegetables Production Technology -Haldavnekar, P.C.; Parulekar, Y.R., Mali, Haldankar.

Note: (If any - such as

- (1. In theory examination, the weightage to numerical problems should not exceed 30%.
- 2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Skill Enhancement Courses (SEC– E-I) Paper Title: Farm Power and Machinery Credits: 02

Paper No: XLII. Practical: 4 lectures/week

Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

- 1. Operation, maintenance & servicing of machines.
- 2. Various sources of farm power and their uses.
- 3. Adjustments and working of machinery.
- 4. Various farm machines & equipment use.
- 5. To know about Machinery

Practicals:

- 1. Introduction to various farm machines & equipment used on the farm.
- 2. Study of different weeding equipment and their uses.
- 3. Study of sprayers and dusters and measurements of nozzle discharge.
- 4. To study construction details adjustments and working of cultivator.
- 5. To study construction details adjustments and working of rotavator.
- 6. To study construction details adjustments and working of Disc Harrow.
- 7. To study construction details adjustments and working of Plough.
- 8. Tractor driving, operation, maintenance & servicing.
- 9. To study different agriculture power machinery, use by farmers.
- 10. Project on agriculture machinery in Kolhapur region.
- 11. Spraying equipment, calibration and operation.

Nature of Practical Examination:

Time: 03 Hrs. Total Marks: 50 Internal Practical Evaluation:

Q.1: Perform any one practical from the above (Major)

- Q.2: Perform any one practical from the above (Minor)
- Q.3: Practical record book
- Q.4: Viva voce

20 marks 10 marks 10 marks 10 marks

Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Skill Enhancement Courses (SEC– E-II) Paper Title: Plant Breeding. Credits: 02

Paper No: XLIII. Practical: 4 lectures/week

Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

- 1. Pollination techniques.
- 2. Hybridization techniques.
- 3. Breeding experiments.
- 4. Varieties with better characteristics in higher yield
- 5. Varieties with Disease resistance, Flood resistance.

Practicals

- 1. Study of floral structure of self-pollinated crops.
- 2. Study of floral structure of cross-pollinated crops.
- 3. Prediction of performance of double cross hybrids.
- 4. Emasculation and hybridization techniques in self-pollinated crops: Green gram, Black gram, Rice, Wheat, Groundnut and Soybean.
- 5. Emasculation and hybridization techniques in cross pollinated crops: Maize, Sunflower, Papaya and Sugarcane.
- 6. Study of male sterility system.
- 7. Handing of segregation populations.
- 8. Methods of calculating mean, range, variance, standard deviation and heritability.
- 9. Designs used in plant breeding experiment.
- 10. To work out the mode of pollination in a given crop and extent of natural out crossing.

Nature of Practical Examination:

Time: 03 Hrs. Total Marks: 50

Internal Practical Evaluation:

Q.1: Perform any one practical from the above (Major)	20 marks
Q.2: Perform any one practical from the above (Minor)	10 marks
Q.3: Practical record book	10 marks
Q.4: Viva – voce	10 marks

Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Skill Enhancement Courses (SEC– E-III) Paper Title: Vegetable Crop Production. Credits: 02 Total Marks: 50 (Practical)

Paper No: XLIV. Practical: 4 lectures/week

Course Outcomes: The students will acquire knowledge of

- 1. Production of Fruit & Vegetable crops
- 2. Fertilizer dosages.
- 3. Crop harvesting techniques.
- 4. Spices cultivation
- 5. Control of weeds and pests.

Practicals:

- 1. Identification of vegetables crops and their seeds (Solanaceae, Cucurbits, Okra)
- 2. Identification of vegetables crops and their seeds (Leguminous, leafy)
- 3. Nursery raising 6 direct seed sowing and transplanting
- 4. Study of morphological characters of different vegetables
- 5. Study of morphological characters of different spices
- 6. Fertilizers applications 10 Propagation and raising of nursery of vegetables
- 7. Propagation and raising of nursery of spices
- 8. Vegetables & spices seed extraction
- 9. Harvesting & preparation for market of vegetables
- 10. Economics of vegetables cultivation 16 Economics of spices cultivation

Nature of Practical Examination: Time: 03 Hrs. Total Marks: 50 Internal Practical Evaluation:

Q.1: Perform any one practical from the above (Major) Q.2: Perform any one practical from the above (Minor)

- Q.3: Practical record book
- Q.4: Viva voce

20 marks 10 marks 10 marks 10 marks

Bachelor of Vocation (B. Voc.) Part- III – Semester- V Sustainable Agriculture Management Skill Enhancement Courses (SEC– E- IV) Paper Title: Field Work/Project/Forest Visit/ Nursery Training. Paper No: XLV. Credits: 02 Term Work: 4 lectures/week Total Marks: 50 (Internal)

Course Outcomes: The students will acquire knowledge of

1. Ecosystem.

2. Forest Conservation.

3. Plantation.

4. Agri/ Plants Exhibition.

5. Excursion report writing.

Students must submit detailed report related to topics on:

1) Green technology / Biodiversity / Ecosystem.

2) Based on Crop Nursery or Forest visit / Agriculture mall / Agriculture Exhibition.

3) Based on Nursery training.

Note: Students should complete Nursery training for the required duration and submit report in the department where the training is completed.

Nature of Practical Examination:	
Total Marks: 50	
Internal Practical Evaluation:	
Report related to above.	40 marks
• Viva- voce	10 marks

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (AECC-F)

Paper: Business Communication in English -IV

Paper No: XLVI Credits: 04 Total Marks: 50 (Theory- 40 + Internal -10) **Theory: 4 lectures/week**

Units Prescribed for Theory: 40 Marks.

Course Outcomes: The students will acquire knowledge of

- 1. To understand and demonstrate writing and speaking processes through invention, organization, drafting, revision, editing, and presentation.
- 2. To understand the importance of specifying audience and purpose and to select appropriate communication choices.
- 3. To understand and appropriately apply modes of expression, i.e., descriptive, expositive, narrative, scientific, and self-expressive, in written, visual, and oral communication.
- 4. To participate effectively in groups with emphasis on listening, reflective thinking, and responding.
- 5. To develop the ability to research and write a documented paper and/or to give an oral presentation.

Content of syllabus:

Unit-I: Theory of Business Letter Writing Parts, Structure, Layouts-Full Block, Modified Block, Semi - Block Principles of Effective Letter Writing, Principles of effective Email Writing

Unit – II Personnel Correspondence

Statement of Purpose Job Application Letter and Resume, Letter of Acceptance of Job Offer, Letter of Resignation

Unit – III Language and Writing Skills

Paragraph Writing -Developing an idea, using appropriate linking devices, etc. Cohesion and Coherence, selfediting, etc. [Interpretation of technical data, Composition on a given situation, a short informal report etc.]

Unit – IV Interviews

Preparing for an Interview Types of Interviews - Selection, Appraisal, Grievance, Exit, Group Discussion Practical: Based on the theory units: Marks: 10 Books Recommended: (List of Minimum 5 Books) Bahl, J. C. and Nagamia, S.M. (1974) Modern Business Correspondence and Minute Writing. Balan, K.R. and Rayudu C.S. (1996) Effective Communication, Beacon New Delhi. Basu, C.R. (1998) Business Organisation and Management, T.M.H. New Delhi. Banerjee, Bani P (2005) Foundation of Ethics in Management Excel Books Businessworld Special Collector's Issue: Ethics and the Manager

Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%. (2. Students can use scientific calculators in theory examination.)

(15 Hrs.)

(15 Hrs.)

(15 Hrs.)

(15 Hrs.)

Bachelor of Vocation (B. Voc.) Part II – Sem. VI (Degree) **Sustainable Agriculture Management** Generic Elective Compulsory Course (GEC-F) Paper Title: Weed and Weed Management **Paper No: XLVII** Credits: 04 Total Marks: 50 (Theory 40 + Internal 10) **Theory: 4 lectures/week Practical: 2 lectures/week/batch** _____ **Course Outcomes:** The students will acquire knowledge of 1. Different approaches of weed management. 2. Uundertaking environmental weed control. 3. Harmful and beneficial effects of weeds in Agriculture. 4. Planning for weed management and weed management processes. 5. Various Weed Management and controlling Unit 1: Weed (15 Hrs.) 7.4 Definition, classification and general characteristics of weeds, Advantages and Disadvantages of weeds 1.2 Crop-weed competition including allelopathy 1.3 Principles and methods of weed control and classification Unit 2: Herbicides (15 Hrs.) 2.1 Herbicides introduction and history of their development 2.2 classification based on chemical, physiological application and selectivity 2.3 mode and mechanism of action of herbicides. **Unit 3: Weed management** (15 Hrs.) 3.1 Weed management in major crops and cropping systems 3.2 parasitic weeds; weed shifts in cropping systems 3.3 aquatic and perennial weed control 3.4 Degradation of herbicides in soil and plants; herbicide resistance in weeds and crops, herbicide rotation. Unit 4 Weed cost-benefit (15 Hrs.) 4.1 Integrated weed management system and its importance 4.2 Weed management in major cereals, pulses, oilseeds, fibre and forage crops; 4.3 Problematic weeds and their control – Parthenium, Cynodon. 4.4 cost: benefit analysis of weed management

Reference Books Recommended:

- 1) Principles in Weed Management Aldrich RJ & Kramer RJ. 1997
- 2) Mode of Action of Herbicides Ashton FM & Crafts AS
- 3) Sustainable Weed Management- Singh HP, Batish DR & Kohli RK. 2006
- 4) Winning the war on weed John Moody.
- 5) Principals of weed V.S. Rao.
- 6) Weed Control Nicholas, Nilda, O. Duke.
- 7) Recent Advances in weed Management -Rakesh Deosharan Singh, Rakesh Kumar Sud.

Note: (If any - such as

- (1. In theory examination, the weightage to numerical problems should not exceed 30%.
- 2. Students can use scientific calculators in theory examination.)

Pattern of Question Paper Bachelor of Vocation (B. Voc.) Part- III – Semester- VI Sustainable Agriculture Management Generic Elective Compulsory Course (GEC– F) Paper Title: Weed and Weed Management

Time: 2 hours

Total Marks: 40

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Q.1	Multiple Choice Questions- 10	10
Q.2	Attempt any TWO of the following.	10
	a.	
	b.	
	с.	
	d.	
Q.3	Write in Brief any TWO of the following.	10
	a.	
	b.	
	С.	
	d.	
Q.4	Write Short Notes on One of the following	10
	a.	
	b.	

Practical Evaluation: 10 Marks

Oral and Presentation based on the units prescribe. Visit to crop field for weed survey.

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Sustainable Agriculture Management Discipline Specific Core Course (DSC– F-I) Paper Title: Landscape Designing

Paper Theor	No: XLVIII y: 4 lectures/week	Credits: 04 Total Marks: 50 (Theory)
Course	e Outcomes: The students will acquire knowledge of	
1. Mea	surable skills, abilities, values of landscape designing.	
2. Plan	and implement the garden design for different types of landscape	
3. Imp	ement garden principles suitable for varied landscape.	
4. Imp	ement bio aesthetic plan for different geographical locations	
5. Crea	te a garden design.	
Unit 1	: Introduction of Landscaping	(15 Hrs.)
1.1	Definition of Landscaping.	
1.2	Importance and scope of landscaping	
1.3	Principles of landscaping	
Unit 2	: Garden	(15 Hrs.)
2.1	Garden definition, styles and types, terrace gardening, vertical gar	dening
2.2	Garden components, adornments, lawn making, rockery, water gan	rden.
2.3	Walk-paths, bridges, other constructed features etc	
2.4	Gardens for special purposes	
Unit 3	: Trees & Climbers	(15 Hrs.)
3.1	Trees: selection, propagation, planting schemes	
3.2	Canopy management, shrubs and herbaceous perennials	
3.3	Selection, propagation, planting schemes, architecture	
3.4	Climber and creepers: importance, selection, propagation, plantin	g.
3.5	Garden plants: palms, ferns, grasses and cacti succulents.	
	Pot plants: selection, arrangement, management.	
Unit 4	Bio-aesthetic planning	(15 Hrs.)
4.1	Definition, need, planning	
4.2	Landscaping of urban and rural areas landscaping, Landscaping of	of schools, public
	places like bus station, railway station, townships, river banks, ho	ospitals, play
	grounds, airports, industries, institutions.	
4.3	Bonsai: principles and management.	
4.4	Lawn: establishment and maintenance.	
4.5	CAD application.	

Reference Books Recommended:

1) Complete Gardening in India - Gopalswamiengar

- 2) Complete Home Gardening Dey, S.C.
- 3) Floriculture and Landscaping Bose, T.K.
- 4) Floriculture and Landscaping Deshraj
- 5) Floriculture in India Randhawa and Mukhopadhyay
- 6) Introduction to Landscaping, Designing, Construction and Maintenance Ronald J..Biondo and Charles B. Schroder
- 7) Landscape Gardening & Design with Plants Supriya Kumar Bhattacharjee
- 8) Landscaping principles and practices Jack E. Ingels

Pattern of Question Paper Bachelor of Vocation (B. Voc.) Part- III – Semester- VI Sustainable Agriculture Management Discipline Specific Core Course (DSC– F-I) Paper Title: Landscape Designing

Time: 2 hours

Total Marks: 50

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Q.1	Multiple Choice Questions-10	10
Q.2	Attempt any TWO of the following.	20
	a.	
	b.	
	c.	
Q.3	Attempt any FOUR of the following.	20
	a.	
	b.	
	с.	
	d.	
	е.	
	f.	

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Sustainable Agriculture Management Discipline Specific Core Course (DSC–F-II) Paper Title: Plant Biochemistry

Paper No: XLIX Theory: 4 lectures/week Total		Credits: 04 Marks: 50 (Theory)	
Course	Outcomes: The students will acquire knowledge of		
1. Unde	rstanding lipid metabolism in plants.		
2. Resea	arch and present orally contemporary biochemical topics.		
3. e stru	cture and functions of Carbohydrates, Amino acids, Proteins, and Lipids		
4. Demo	onstrating advanced knowledge and understanding in Protein, enzymes, lipids etc.		
5. Desci	ribe the structural characteristics, functional properties and regulation of enzymes.		
Unit 1:	Introduction- Carbohydrates	(15 Hrs.)	
1.1	Introduction, scope and importance in agriculture.		
1.2	Carbohydrates - Definition, Classification, Chemistry and Structural formula of sacch	narides	
1.3	Glucose, fructose, Galactose, Sucrose. Lactose.		
1.4	Starch & Cellulose		
Unit 2	Proteins & Amino acids	(15 Hrs.)	
2.1	Proteins: Definition, Classification, Composition, Properties, Primary and secondary structure and its important functions		
2.2	Definition Classification, important properties and their nutritional significance		
Unit 3:	Lipids	(15 Hrs.)	
3.1	Definition, Classification, important common saturated and unsaturated fatty acids found in fats and oils and structural formula.		
3.2	Saturated fatty acids - Butyric, caproic, palmitic and stearic acid.		
3.3	Unsaturated fatty acids – oleic, linolenic, erucic acid.		
Unit 4:	Enzymes, Vitamins	(15 Hrs.)	
4.1	Definition, nomenclature and function and factors affecting of enzyme activity.	. ,	
4.2	Vitamins: Definition Classification and their sources, biochemical functions.		
4.3	Structural formula of vitamin A, D, E, K, Thiamine, Riboflavin and Nicotinic acid.		
Referen	nce Books Recommended:		

- 1) Biochemistry and Molecular Biology of Plants (2015) Buchanan, Gruissem and Jones
- 2) Plant Physiology, Biochemistry and Biotechnology- S K Verma and Mohit Verma
- 3) Plant Biotechnology: The Genetic Manipulation of Plants -Adrian Slater and Nigel W Scott

- 4) The New Frontiers in Plant Biochemistry (Advances in Agricultural Biotechnology)" by T Akazawa and T Asahi
- 5) Introduction to Protein structure Carl Branden, Tooze.
- 6) Principals of Biochemistry Laurence, Moran.
- 7) Molecular Biology of Cell Bruce Alberts.

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Sustainable Agriculture Management Discipline Specific Core Course (DSC– F-III) Paper Title: Fruit: Plantation, Production & Harvesting.

Paper No: L	Credits: 04	
Theory: 4 lectures/week	Total Marks: 50 (Theory)	

 Course Outcomes: The students will acquire knowledge of 1. Different disease of fruit, plantation, medicinal & aromatic crops. 2. To develop skills on various control measures of disease. 3. To understand the loss caused by various disease, their eco-biology, in details on different Fruits. 4. To know importance of different fruit crops and plantation crops 5. Understand canopy architecture for higher productivity and package of practices for Fruits. 			
UNIT 1: 1.1 1.2 1.3 1.4	Fruits Plantations Fruit plantation techniques. Importance, scope and present position of fruit plantation. High density planting, Use of root stocks. Special Horticulture practices	(15 Hrs.)	
UNIT 2: 2.1 2.2 2.3	 Fruit Production Production techniques of plantation crops: Coconut, Cashew nut, Tea, Coffee. Diseases of fruit plants Practices involved in the production of fruits: Mango, Guava, lime, Banana, Grape, Papaya, Ber, Jack Fruit, Apple 	(15 Hrs.)	
UNIT 3: 3.1 3.2 3.3 3.4	Fruit Harvesting Pre-harvest factors affecting postharvest quality and Maturity Importance of fruits and possible causes of post-harvest losses Ripening and changes occurring during ripening Heat, chilling & freezing injury	(15 Hrs.)	
UNIT 4: 4.1 4.2 4.3	Methods of Preservation Drying/ Dehydration of fruits - Concept and methods, osmotic drying Canning - Concepts and Standards Packaging of products	(15 Hrs.)	
Reference B 1. Handbook 2. Tropical ar	ooks Recommended: of Horticulture ICAR publication nd Subtropical Fruit crops -T.K. Bose		

- 3. Fruit Culture in India -Sham Singh
- 4. Fruits Ranjit Singh
- 5. Physiology of Fruit Production Amar Singh
- 6. Coconut Thumpan.
- 7. Advance s in Horticulture K.L. Chadha.
- 8. Temperate fruits Mitra, Thakur and Bose.

9. Introduction to spices and Plantation crops- N. Kumar.

10. Plantation Crops - J.S. Pruthi.

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Sustainable Agriculture Management Skill Enhancement Courses (SEC– F-I) Paper Title: Landscape Designing

Paper No: LI Practical: 4 lectures/week

Credits: 02 Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

- 1. Landscape architecture.
- 2. waterlogging conditions.
- 3. Develop basic drafting, rendering, layout, and presentation skills
- 4. Professional competence and skill in a wide range.
- 5. Selections of plants and Plantation techniques.

Practicals:

- 1. Identifications and propagation of annual, herbs and shrubs
- 2. Identifications and propagation of climbers, creepers and perennials
- 3. Identifications and propagation palms, ferns, grasses, cacti and succulents
- 4. Planning, designing and layout of formals and informal gardens
- 5. Planning, designing and layout special gardens.
- 6. Study of different potting mixtures, soilless cultures and preparation of potted plants
- 7. Maintenance and repairs of potted plants
- 8. Planting and Maintenance of Lawn
- 9. Irrigation and nutrient management in Landscape Garden
- 10. Practicing terrarium gardens and vertical garden
- 11. Development and Maintenance of topiary
- 12. Practicing flower Arrangement
- 13. Bonsai Practicing and training
- 14. Canopy Management in ornamentals shrubs and perennials
- 15. Visit to Landscape gardens.

Nature of Practical Examination:

Time: 03 Hrs. Total Marks: 50

Internal Practical Evaluation:

- Q.1: Perform any one practical from the above (Major)
- Q.2: Perform any one practical from the above (Minor)
- Q.3: Practical record book
- Q.4: Viva voce

20 marks 10 marks 10 marks 10 marks

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Sustainable Agriculture Management Skill Enhancement Courses (SEC–F-II) Paper Title: Plant Biochemistry.

Paper No: LII Practical: 4 lectures/week

Credits: 02 Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

- 1. Demonstration of basic oxidation and reduction reactions.
- 2. Use of handling of glass wares, minor equipment for conducting experiments.
- 3. Learn safety and precautionary measures for working in a laboratory.
- 4. Good laboratory practices in a chemistry/biochemistry laboratory.
- 5. Identify starch, proteins and carbohydrates by qualitative test

Practicals:

- 1. Qualitative test of important sugars in plants.
- 2. Estimation of reducing and non-reducing in sugar cane juice and jaggery.
- 3. Quantitative determination of protein in pulses and fats and oils in oil seeds.
- 4. Estimation of Ca as Cao and CaCO3 in plant.
- 5. Qualitative test of important proteins in plants.
- 6. Demonstrate the activity of peroxidase in plant material.
- 7. Qualitative test on carbohydrates
- 8. Preparation of buffer solution and measurement of pH.
- 9. Study of enzymatic hydrolysis of starch
- 10. Qualitative test on lipids.

Nature of Practical Examination:

Time: 03 Hrs. Total Marks: 50

Internal Practical Evaluation:

Q.1: Perform any one practical from the above (Major)20 marksQ.2: Perform any one practical from the above (Minor)10 marksQ.3: Practical record book10 marksQ.4: Viva – voce10 marks

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Sustainable Agriculture Management Skill Enhancement Courses (SEC– F-III) Paper Title: Fruit: Plantation, Production & Harvesting.

Paper No: LIII Practical: 4 lectures/week

Credits: 02 Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

- 1. Skills of different fruit crops and plantation crops.
- 2. Harvesting scientific techniques
- 3. Package practices of Fruits
- 4. Higher Productivity of Fruits
- 5. Preservation techniques.

Practicals:

- 1. Identification of fruits and plantation crops.
- 2. Orchard layout and planting.
- 3. Practice of different propagation methods with special reference to fruits.
- 4. Practice of training and pruning of fruit plants.
- 5. Plant protection practices.
- 6. Visit to orchards, nurseries and research centres of fruits and plantation crops.
- 7. Preparation of Grape Wine.
- 8. Specification suggested by FSSAI-Specification of Fruit Beverages.
- 9. Canning of fruits and vegetables.
- 10. Principles for prolonging storage life.
- 11. Effect of ethylene on ripening process
- 12. Preparation of Jam, Jelly and Ketchup.

Nature of Practical Examination:

Time: 03 Hrs. Total Marks: 50

Internal Practical Evaluation:

Q.1: Perform any one practical from the above (Major)20 marksQ.2: Perform any one practical from the above (Minor)10 marksQ.3: Practical record book10 marksQ.4: Viva - voce10 marks

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Sustainable Agriculture Management Skill Enhancement Courses (SEC– F-IV) Paper Title: Project / Field work/ Visit

Paper No: LIV Term Work: 4 lectures/week

Credits: 02 Total Marks: 50 (Internal)

Course Outcomes: The students will acquire knowledge of

1. Biotechnology practical skill.

- 2. Forest Conservation.
- 3. Plantation techniques.
- 4. Agri mall / Plants Exhibition.
- 5. Excursion report writing.

1. Inculcate proficiency to identify appropriate research topic and presentation.

2. Field study to a place of plant diversity within or outside Kerala and prepare a report and submit to the external examiners.

Students must submit detailed report related to topics on:

- 1) Weed classification / Agricultural apps. / Tissue culture lab visit/ Agri Mall Visit.
- 2) Based on Landscape designing / Fruit production.
- 3) Green technology/ Nursery training

Note: Students should complete training for the required duration and submit report in the department where the training is completed.

Nature of Practical Examination: Total Marks: 50 Internal Practical Evaluation:

- Report related to above.
- Viva- voce

40 marks 10 marks