Estd. 1962
"A++" Accredited by NAAC (2021)
With CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR
416 004, MAHARASHTRA
PHONE : EPABX – 2609000, BOS Section – 0231-2609094, 2609487
Web : www.unishivaji.ac.in Email: bos@unishivaji.ac.in
शिवाजी विद्यापीठ, कोल्हापूर, ४१६ ००४, महाराष्ट्र
दूरध्वनी - इपीबीएक्स - २०६०९०००, अभ्यासमंडळे विभाग : ०२३१- २६०९०९४, २६०९४८७
वेबसाईट : www.unishivaji.ac.in ईमेल : bos@unishivaji.ac.in

Ref.: SU/BOS/ *IDS* /564 **Date: 18 - 09- 2025**

To,

The Principal,
All Concerned Affiliated Colleges/Institutions
Shivaji University, Kolhapur

Subject : Regarding revised syllabi of **B. Voc. Part I (Sem. I & II)** degree programme under the Faculty of Inter- Disciplinary Studies as per NEP-2020 (2.0).

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 revised syllabi, nature of question paper and equivalence of **B. Voc. Part I (Sem. I & II)** for follower's degree programme under the Faculty of Inter- Disciplinary Studies as per National Education Policy, 2020 (NEP 2.0).

Course
B. Voc. Automobile Part - I
B. Voc. Sustainable Agriculture Part - I
B. Voc. Food Processing Technology Part - I
B. Voc. Graphic design Part -I
B. Voc. Sustainable Agriculture Management Part -I
B. Voc. Nursing and Hospital Management Part -I
B. Voc. Tourism and Service Industry Part - I

This syllabus, nature of question and equivalence shall be implemented from the academic year **2025-2026** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in NEP-2020 (Online Syllabus)

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2025 & March/April 2026. These chances are available for repeater students, if any.

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

Thanking you,

Yours Faithfully

(Dr. S. M. Kubal)
Dy Registrar

Encl. : As above.

Copy to: For Information and necessary action.

1	The Dean, Faculty of IDS	7	Affiliation T. 1 & T. 2 Section
2	Director, Board of Examination and Evaluation	8	Appointment A & B Section
3	The Chairman, Respective Board of Studies	9	P.G.Seminar Section
4	All On Exam Section	10	I.T. Cell
5	Eligibility Section	11	Internal Quality Assurance Cell (IQAC)
6	P. G. Admission Section		

Shivaji University Kolhapur

Established: 1962

Accredited By NAAC with 'A++' Grade with CGPA 3.52

Revised Syllabus For

Bachelor of Vocation [B. Voc.] (NEP-2.0)

Part-I

(Sustainable Agriculture)

UNDER

Faculty of Interdisciplinary Studies Structure, Scheme and Revised Syllabus

(To be implemented from academic year 2025-26 onwards).

Shivaji University, Kolhapur

NEP-2020 (2.0): Credit Frame work for UG B.Voc. I Programme under Faculty of Under Faculty of Interdisciplinary Studies

B.Voc. I (Sustainable Agriculture)

Level	Semester	COURSES			OE	VSC/SEC	AEC/VEC/IKS	OJT/FP/CEP/CC/ RP	Total Credit
		Course –I	Course -II	Course -III			IKS		
4.5	I	DSC-I (2) DSC-II (2) DSC Pract. I (2)	DSC-I (2) DSC-II (2) DSC Pract. I (2)	DSC-I (2) DSC-II (2) DSC Pract.I(2)	OE -I (P)(2)		IKS-I (2) Introduction to IKS		
	Credits	4+2=6	4+2=6	4+2=6	2		2		22
	II	DSC-III (2) DSC-IV (2) DSC Pract. II (2)	DSC – III(2) DSC-IV(2) DSC Pract.II(2)	DSC-III(2) DSC-IV(2) DSC Pract.I(2)	OE-II (P)(2)		VEC-I(2) (Democracy, Election and constitution)		
	Credits	4+2=6	4+2=6	4+2=6	2		2		22
1st Year Cum. Credits		8(T)+4(P)= 12	8(T)+4(P)= 12	8(T)+4(P)=12	2+2 =4		2 + 2= 4		44
Exit Option: Award of FY Diploma Certificate with 44 Credits									

Semester I
B. Voc. Sustainable Agriculture

Sem.	Course	Code	Paper No.	Title of Paper
I	I	DSC- I	B.Voc. Paper- I	Fundamentals of Agronomy - I
		DSC- II	B.Voc. Paper- II	Fundamentals of Horticulture - I
		DSC- P- I	B.Voc. Practical –I	Based upon DSC-I and DSC- II
	II	DSC- I	B.Voc. Paper- I	Principles of Food Processing - I
		DSC- II	B.Voc. Paper- II	Marketing Channels& Strategies -I
		DSC- P- I	B.Voc. Practical –II	Based upon DSC-I and DSC -II
	III	DSC- I	B.Voc. Paper- I	Insects Ecology - I
		DSC- II	B.Voc. Paper- II	Fundamental of Entomology - I
		DSC- P- I	B.Voc. Practical –III	Based upon DSC – I and DSC - II
	OE -I	Open Elective	Practical (2)	Vermi-composting
	IKS	Indian Knowledge System	Theory (2)	IKS (Generic)

Semester II
B. Voc. Sustainable Agriculture

Sem.	Course	Code	Paper No.	Title of Paper
II	I	DSC- I	B.Voc. Paper- I	Fundamentals of Agronomy - II
		DSC- II	B.Voc. Paper- II	Fundamentals of Horticulture - II
		DSC- P- I	B.Voc. Practical –II	Based upon DSC -I and DSC-II
	II	DSC- I	B.Voc. Paper- I	Principles of Food Processing - II
		DSC- II	B.Voc. Paper- II	Plantation Crops, Fruits Spices and Medicinal plants -II
		DSC- P- I	B.Voc. Practical –II	Based upon DSC – I and DSC - II
	III	DSC- I	B.Voc. Paper- I	Fundamental of Seed Technology& IPR
		DSC- II	B.Voc. Paper-II	Fundamental of Plant Breeding & Plant Physiology
		DSC- P- I	B.Voc. Practical-III	Based upon DSC – I and DSC - II
	OE -II	Open Elective - II	Theory (2)	Organic Composting
	VEC	Value Education Course	Theory (2)	Democracy, Election and Good Governance

Eligibility for Admission: 10 + 2 from any faculty or equivalent Diploma /Advanced Diploma in any related stream.

Eligibility for Faculty:

1) M. Sc. (Agri. /Agro Chemicals and Pest Management / Horticulture/Food Processing/ Food Science and Technology/ Food Science and Quality Control) with NET /SET/Ph.D.
2) M. A (English) with NET/SET for Business Communication Eligibility for Laboratory Assistant: B.Sc. (Agri. /Agro Chemicals and Pest Management/Horticulture/Food Processing/ Food Science and Technology/ Food Science and Quality Control)/ Diploma in Agri.

• Staffing Pattern Teaching: a) In 1st Year of B. Voc. - 1 Full Time and 2 Visiting Lecturers for Sustainable Agriculture and 1 CHB Lecturer for Business Communication Lab Assistant: For 1st Year of B. Voc. - 1 Part time

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SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I

(Course - I) DSC– I B.Voc. Paper I

Fundamentals of Agronomy- I

Theory: 30 Hours

(Credits: 02)

Unit 1: Classification of Agricultural Crops (8 hours)

Agricultural, Agronomic and Botanical classification of crops, Major farming systems in Maharashtra and Cropping Intensity, Methods of sowing/planting - planting geometry and its effect on growth and yield.

Unit 2: Agronomy of Crop plants (7 hours)

Soil and climatic requirements, varieties, cultural practices, special systems of cultivation, harvesting and processing of major cereals, millets (Finger Millet and Bajara),

pulses, tuber crops, Rice and Maize

Unit 3: Soil Productivity (8 hours)

Nutrients: Classification, Sources, Organic manures. Nutrient recycling through manures and fertilizers.

Unit 4: Soil Fertility (7 hours)

Fertilizers: Use management of fertilizers. Biological nitrogen fixation, Green manure crops and cover crops

Reference Books:

1. Balasubramaniyan, P and Palaniappan, S. P. 2001.*Principles and Practices ofAgronomy* Argo Bios (India) Ltd., Jodhpur.
2. Cox, G.W and Atkins, M.D. 1979. *Agricultural Ecology: An Analysis of World Food Production Systems.* W.H. Freeman and Company, San Francisco
3. De, G. C.1989. *Fundamentals of Agronomy*. Oxford & IBH Publishing Co., New Delhi.
4. Grigg, D.B. 1974. *The Agricultural Systems of the World: An Evolutionary Approach*. Cambridge University Press, Cambridge.
5. Harlan, J.R. 1992. *Crops and Man*. American Society of Agron & Crop Science Society of America, Madison, WI.
6. Reddy. T. Y and Reddy, G.H.S.1995. *Principles of Agronomy*, Kalyani Publishers, Ludhiana.

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I
(Course - I) DSC – II B.Voc. Paper II
Fundamentals of Horticulture- I
Theory: 30 Hours
(Credits: 02)

Unit 1: Classification of Horticultural Crops (8 hours)

Classification of horticultural crops, Branches of Horticulture, Importance of horticulture in India, Orchard planning, Training and pruning in horticultural crops - principles and methods, techniques of training and pruning, fruit thinning.

Unit 2: Plant Propagation (Sexual Propagation) (7 hours)

Definition and basic concepts, sexual and asexual types – advantages and disadvantages, Media, containers, potting, re-potting and pre- planting treatments.

Unit 3: Plant Propagation (Asexual Propagation) (8 hours)

Asexual propagation: propagation by cuttings, types of cuttings, factors affecting rooting. Propagation by layering types of layering. Propagation by grafting - methods of grafting - development of graft unions, separation and after care. Propagation by budding, methods of budding. Comparative account of grafting and budding.

Unit 4: Selection of Root Stock and Scion (Asexual Propagation) (7 hours)

Asexual Reproduction and its Ideal characteristics of selection of root stock and scion, example of root stock and scion.

Reference Books:

1) Bose, TK., Mitra, SK. and Sadhu, K. 1986.*Propagation of tropical andsubtropical horticultural crops*. Naya Prokash, Calcutta.
2) Denixon,RI.1979. *Principles of Horticulture*. MacMillan, New York.
3) Edmond,JB.,Sen,TD,Andrews,TSandHalfacre,RG.1977.*Fundamentals of Horticulture*. Tata McGraw Hill, New Delhi
4) P.E. 1975.*Plant Growth and Development.* Tata McGraw Hill Publishing Co. Ltd., New Delhi.
5) Chadha, K. L. 2003. Handbook of Horticulture, ICAR, New Delhi. Choudhury, B.1983. Vegetables. National Book Trust, New Delhi.
6) Das, P.C.1993.Vegetable crops in India. Kalyani Publishers
7) Gopalakrishnan, T. R. 2007. Vegetable Crops. New India Publishing Agency, New Delhi.
8) Hazra, P. and Som, M. G. 1999. Technology for vegetable Production and Improvement. Naya Prokash, Calcutta.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I
(Course - I) DSC– III B.Voc. Paper III
Fundamentals of Agronomy & Fundamentals of Horticulture- I (Practical- I)
(Credits: 02)

List of Experiments:

Group- I

1. Identification of cereals and millets, Pulses, and Tuber crops.
2. Different methods of sowing; direct seeding: broadcasting, dibbling and drilling-transplantation.
3. Seed treatment- Rhizobium inoculation of leguminous crops.
4. Identification of manures –organic manures: bulky and concentrated manures Fertilizers: Straight, Complex and mixed fertilizers – identification
5. Fertilizer recommendation and calculation for major cereals and pulses.
6. Practice of methods of fertilizer applications- broadcasting, placement, foliar application and fertigation.
7. Familiarization to different planting systems and layout
8. Propagation structures – mist chamber, green house, etc.

Group- II

9. Propagation by cutting.
10. Propagation by layering – types of layering
11. Propagation by grafting – methods of grafting
12. Propagation by budding – methods of budding
13. To study Care and maintenance of nursery seedlings
14. To study different growth media for nursery seedlings
15. Nursery Visit
16. Case Study on Agronomy of any crop studied in syllabus

Reference Books:

1. Bose, TK., Mitra, SK. and Sadhu, K. 1986. Propagation of tropical and subtropical horticultural crops. Naya Prokash, Calcutta.
2. Denixon, R. I. 1979. Principles of Horticulture. MacMillan, New York.
3. Edmond, JB., Sen, TD, Andrews, TS and Halfacre, RG.1977. Fundamentals of Horticulture. Tata McGraw Hill, New Delhi
4. P.E. 1975. Plant Growth and Development. Tata Mc Graw Hill Publishing Co. Ltd., New Delhi.
5. Chadha, K. L. 2003. Handbook of Horticulture, ICAR, New Delhi. Choudhury, B.1983. Vegetables. National Book Trust, New Delhi.
6. Das, P. C.1993.Vegetable crops in India. Kalyani Publishers.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I

(Course - II) DSC– I B.Voc. Paper I

Principles of Food Processing - I

Theory: 30 Hours

(Credits: 02)

Unit 1: Classification of Food (8 hours)

Definition of food, classification of foods – based on origin, pH, nutritive value, functions of food, Healthy food, ethnic food, organic food, functional food, nutraceuticals. Steps involved in converting a raw harvested food materials to a preserved product with sound quality- harvesting, storage, manufacturing, preservation, packaging, distribution and marketing.

Unit 2: Post Harvest Management (7 hours)

Chemical, enzymatic, physical and biological deterioration, implications and Prevention.

Use of cold storage, use of chemical and biological preservatives

Unit 3: Banana Processed Products (8 hours)

Banana puree, banana chips, banana powder, Banana chips, banana flour; Soybean products – Oil,

Unit 4: Preservation of Processed Products (7 hours)

Principles of preservations different preservatives used for preservations its role and function for increasing life of processed product

Reference Books:

1. Brian E. Grimwood, Coconut Palm Products: Their Processing in Developing Countries, 1979.
2. Hui, Y H and Associate Editors; Hand Book of Food Products Manufacturing Vol. I, Wiley-Interscience, New Jersey 2007.
3. Hui, Y H and Associate Editors; Hand Book of Food Products Manufacturing Vol. II, wiley- Interscince, New Jersey 2007.
4. Manay, N.S, Shadakshara swamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
5. Potter, N.N, Hotchkiss, J.H. Food Science.CBS Publishers, NewDelhi.2000.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I
(Course - II) DSC– II B.Voc. Paper II
Marketing Channels & Strategies -I
Theory: 30 Hours
(Credits: 02)

Unit 1: Market Structure (8 hours)

Basic principles of agricultural marketing, definition of Market Structure, classification of Market – based on origin, types of crop, Price fluctuation and consumer buying behavior, Cooperative marketing in agriculture

Unit 2: Market Access Policies (7 hours)

Marketing strategies for agricultural produce, access to small and marginal farmers through Farmer Producer Companies in India, Market Segmentation, Market gambling, APMC and Agri Licensing, Law of marginal utility

Unit 3: Maret Classification (8 hours)

Market types on the basis of ownership of market, on the basis of nature of market, on the basis of market commodities, on the basis governing agencies etc.

Unit 4: Maret Demand and Supply (7 hours)

Market demand & supply concept, Market demand & supply ratio, commodities nature it's Classification, factors affecting market demand and supply, factors affecting Market demand & supply ratio etc.

Reference Books:

1. Manay, N.S, Shadakshar aswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
2. Potter, N.N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi.2000.
3. Srilakshmi, B. Food Science (3rdedition), New Age International (P) Limited Publishers, New Delhi, 2003.
4. Hui, Y H and Associate Editors; Hand Book of Food Products Manufacturing Vol. I, Wiley- Inter science, New Jersey 2007.
5. Hui, Y H and Associate Editors; Hand Book of Food Products Manufacturing Vol II, Wiley- Inter science, New Jersey 2007.

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I

(Course - II) DSC– III B.Voc. Paper III

Principles of Food Processing & Marketing Channels &Strategies (Practical)

(Credits: 02)

List of Experiments:

Group- I

1. Preparation of Tomato souce
2. Preparation of Tomato ketchup
3. Preparation of Potato chips
4. Preparation of Banana chips
5. Preparation of Mango Pickle
6. Orientation of Markt Structure
7. Preparation of questionnaire on Market Surplus
8. Case study on nearby agricultural produce market / shop

Group- II

9. To study nature and demand supply
10. Study of Retail Chains / Supermarkets- Marketing strategy of Big Bazaar, Reliance Fresh, D-Mart
11. Study of Advertisement & Promotion Strategies
12. Price Spread & Marketing Margin Calculation
13. Visit to Agro-Processing Unit
14. Study of Agricultural Marketing Channels – Visit a local market to identify producer
15. To study Price Spread & Marketing Margin Calculation
16. Role of Middlemen in Marketing Channels. Example. Commission agents

Reference Books:

1. Manay, N. S, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
2. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi.2000.
3. Srilakshmi, B. Food Science (3rd edition), New Age International (P) Limited Publishers, New Delhi, 2003.
4. Hui, Y H and Associate Editors; Hand Book of Food Products Manufacturing Vol. I, Wiley-Inter science, New Jersey 2007.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I

(Course -III) DSC– I B.Voc. Paper I

Insect Ecology– I

Theory: 30 Hours

(Credits: 02)

Unit 1: Insect Ecology (8 hours)

Definition, Population dynamics- effect of abiotic factors- temperature, moisture, humidity, Rainfall, light, atmospheric pressure and air currents. Effect of biotic factors - food, natural enemies. Pest surveillance and forecasting, biological control,

Unit 2: Insect Plant Interactions (7 hours)

Herbivory, host plant selection, monophagy vs. polyphagy, Plant defence Mechanism (secondary metabolites) Lotka -Voltera Model, use of botanical pesticides, coevolution.

Unit 3: Insect diversity and IPM (8 hours)

Agriculturally important Insects: Lepidoptera, Coleoptera, Hemiptera, Diptera and Hymenoptera. Life tables, risk analysis

Unit 4: Integrated Pest Management (7 hours)

Introduction, history, importance, concepts, principles and tools of IPM. Study of major pests in vegetable crop (Cabbage), stored grains (Rice) and their control.

Suggested Readings:

1. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.
2. Richards, O.W. and Davies, R. G. 1977.Imm's General Text Book of Entomology, Vol.1&2, Chapman and Hall Publication, London.
3. Srivastava, P. D. and Singh, R. P. 1997.An Introduction to Entomology, Concept Publishing Company, New Delhi.
4. Dhaliwal, G. S. and Ramesh Arora.1998. Principles of Insect Pest Management. Kalyani 14 Publishers, New Delhi

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I

(Course - III) DSC– II B.Voc. Paper II

Fundamental of Entomology & Insectology - I

Theory: 30 Hours

(Credits: 02)

Unit 1: History of Entomology (8 hours)

Classification of phylum Arthropod. Relationship of class Insecta with other classes of Arthropod. Morphology– Grasshopper/ Plant bug, structure and functions of insect cuticle, Moulting. Body segmentation.

Unit 2: Insect and their body parts (7 hours)

Structure of Head, thorax and abdomen .Structure and modifications of insect mouth parts.Types of insect larvae and pupae.

Unit 3: Insect and their Anatomy (8 hours)

Digestive system, Circulation system, Respiration system, Excreta system and Reproductive system of insect etc. their parts and functions.

Unit 4: Insect and their Anatomy (7 hours)

Identification, symptoms of damage caused by pests of Wheat, Coconut, Banana, Brinjal, Bitter gourd andcowpea. Nematode Pests of crops, Common Pests of stored food products/grains. Pest monitoring Pest surveillance and pest forecasting. Assessment of pest population and damage.

Reference Books:

1. Nayar, K.K. Ananthakrishnan T. N. and David.B.V.1976.GeneralandApplied Entomology, Tata Mc Graw Hill Publishing Company Limited, New Delhi, 589.
2. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.
3. Richards, O.W. and Davies, R. G. 1977.Imm's General Text Book of Entomology, Vol.1&2, Chapman and Hall Publication, London.
4. Srivastava, P. D. and Singh, R. P. 1997.An Introduction to Entomology, Concept Publishing Company, New Delhi.
5. Dhaliwal, G.S. and RameshArora.1998. Principles of Insect Pest Management. Kalyani 14 Publishers, New Delhi.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I

(Course - III) DSC– III B.Voc. Paper III

Insects Ecology and Fundamental of Entomology & Insectology (Practical)

(Credits: 02)

List of Experiments:

Group-I

1. To study types of insect mouthparts.
2. To study structure and modifications of insect antennae.
3. To study structure and modifications of insect legs
4. To study types of insect larvae and pupae.
5. Identification of different types of insect damages on crop plants
6. Identification, symptoms of damage, collection and preservation of pests of Rice, Coconut, Banana, Brinjal, Bitter gourd and cowpea.
7. Identification of Pests of stored food grain / products
8. Sampling techniques for the estimation of insect population in selected crops

Group-II

9. Collection and preservation of Insect adult, larvae pupae etc.
10. Preparation of insect collection box.
11. To study insect taxonomy and identification.
12. To study beneficial insect.
13. To study stored grain pests.
14. Integrated pests' management.
15. To Insect collection preservation.
16. Case study of particular insect.

Suggested Readings:

1. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.
2. Richards, O.W. and Davies, R. G. 1977.Imm's General Text Book of Entomology, Vol.1&2, Chapman and Hall Publication, London.
3. Srivastava, P. D. and Singh, R. P. 1997.An Introduction to Entomology, Concept Publishing Company, New Delhi.
4. Dhaliwal, G. S. and Ramesh Arora.1998. Principles of Insect Pest Management. Kalyani Publishers, New Delhi.

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. I

OPEN ELECTIVE - I

Vermi-composting (Practical)

(Credits: 02)

List of Practical:

Group-I

1. Identification of earthworm species
2. Study of morphology, life stages and development of earth species used
3. Study of pest diseases in earthworm species used
4. Study of components / equipments in Vermicomposting
5. Rearing of earthworms
6. Preparation of vermi-composting bed
7. Site selection for preparation of vermi-composting
8. Procedure for preparation of Vermiwash

Group-I

9. Procedure for filling pits / tetra beds for preparation of vermi-compost
10. Harvesting, packaging, transport and storage of Vermicompost and separation.
11. To study design and preparation of vermi-bed
12. Demonstration on filling of Vermi -bed.
13. Study of pH and Humidity of different soil sample
14. To study the Vermi-wash
15. Field visit to Vermi-compost unit

Reference Books:

1. Balasubramaniyan, P and Palaniappan, S.P.2001. *Principles and Practices of Agronomy* Agro Bios (India) Ltd., Jodhpur.
2. Cox, G.W and Atkins, M.D. 1979. *Agricultural Ecology: An Analysis of World Food Production Systems.* W.H. Freeman and Company, San Francisco
3. De, G.C. 1989. *Fundamentals of Agronomy*. Oxford & IBH Publishing Co., New Delhi.
4. Grigg, D.B. 1974. *The Agricultural Systems of the World: An Evolutionary Approach*. Cambridge University Press, Cambridge.
5. Harlan, J.R. 1992. *Crops and Man*. American Society of Agroy & Crop Science Society of America, Madison, WI.
6. Reddy.T.Y and Reddy, G.H.S.1995.*Principles of Agronomy,* Kalyani Publishers, Ludhiana.

शिवाजी विद्यापीठ, कोल्हापूर

बी. व्होक. भाग १ (शाश्वत शेती) राष्ट्रीय शैक्षणिक अभ्यासक्रम २०२० (२.०) जून २०२५ पासून अभ्यासक्रम

बी. व्होक. भाग १ (शाश्वत शेती) सत्र १

वैकल्पिक विषय- १

गांडूळ-कंपोस्टिंग (प्रात्यक्षिक)

(क्रेडिट: ०२)

प्रात्यक्षिक यादी

गट-I

१. गांडुळांच्या प्रजातींची ओळख

२. वापरल्या जाणाऱ्या पृथ्वीवरील प्रजातींचे आकारविज्ञान, जीवनाचे टप्पे आणि विकास यांचा अभ्यास

३. वापरल्या जाणाऱ्या गांडुळांच्या प्रजातींमधील कीटक रोगांचा अभ्यास

४. गांडूळ खतातील घटकांचा / उपकरणांचा अभ्यास

५. गांडुळांचे संगोपन

६. गांडूळ-खत तयार करण्यासाठी गांडूळ-खत तयार करण्यासाठी जागा निवड

८. गांडूळखत तयार करण्याची प्रक्रिया

गट-II

९. गांडूळखत तयार करण्यासाठी खड्डे / बेड भरण्याची प्रक्रिया

१०. गांडूळखताची काढणी, पॅकेजिंग, वाहतूक आणि साठवणूक आणि वेगळे करणे.

११. गांडूळखताची रचना आणि तयारीचा अभ्यास करणे

१२. गांडूळखत भरण्याचे प्रात्यक्षिक.

१३. वेगवेगळ्या मातीच्या नमुन्यांचा पीएच आणि आर्द्रतेचा अभ्यास करणे

१४. गांडूळखताचा अभ्यास करणे

१५. गांडूळखत युनिटला भेट देणे

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. II

(Course - I) DSC–I B.Voc. Paper I

Fundamental of Agronomy II

Theory: 30 hours

(Credits: 02)

Unit 1a: Irrigation Techniques: (8 hours)

Definition and objectives, Role of water in soil and plants – Irrigated Agriculture vs. Rainfed agriculture, dry farming and dry land farming definition.

Unit 2: Evapo-transpiration (7 hours)

Evapo-transpiration, potential evapo- transpiration and consumptive use, Reference crop evapo-transpiration (ETo)-Crop co-efficient (Kc) - Kc values for different crops. Methods of determining water requirement- effective rainfall.

Unit 2: Methods of irrigation (8 hours)

Define irrigation, Surface irrigation system, sprinkler irrigation system, drip irrigation system. Agronomic techniques to improve water, use efficiency- factors affecting water use efficiency.

Unit 4: Soil Erosion (7 hours)

Nature and extent of erosion; types- soil erosion by water- different forms- Soil conservation vs. water conservation - agronomic measures- mechanical measures Role of grasses and pastures in soil conservations ;Wind breaks and shelter belts.

Reference Books:

1. Lenka, D.2001.Irrigation *and Drainage*. Kalyani Publishers, New-Delhi.
2. Mal, B.C. 2002. *Introduction to Soil and Water Conservation Engineering*, Kalyani Publishers, New-Delhi.
3. Michael, A. Mand Ojha, T.P.2005. *Principles of Agricultural Engineering*-Vol.II .Jain Brothers, New Delhi.
4. Michael, A.M.1988. *Irrigation Theory and Practice*. Vikas Publishing House Pvt. Ltd., New Delhi

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. II
(Course - I) DSC– II B.Voc. Paper II
Fundamental of Horticulture II
Theory: 30 hours
(Credits: 02)

Unit 1: Introduction of Plantation crops (8 hours)

Introduction - importance - area, production - origin, distribution - botany, varieties - climate, soil, site selection - propagation, production of quality planting materials and hybrids.

Unit 2: Nursery Management (7 hours)

Nursery management - layout, planting, aftercare- irrigation, manuring - stage of harvest, harvesting, post-harvest handling yield and uses of:-Coconut and Mango

Unit 2: Floriculture (8 hours)

Definition, Classification, varieties, production technology - climate, soil, propagation, nursery management - site selection, layout, planting, irrigation, disease and pest management harvesting, post-harvest handling, packaging and storage: Marigold, Gerbera and Tuberose.

Unit 4: Post harvest management (7 hours)

Post-harvest handling, packaging and storage: Marigold, Gerbera and Tuberose, plantation crop Coconut and Mango

Reference Books:

1. Pruthi.J.S. 1993.Major Spices of India, Crop Management - Post Harvest Technology, ICAR, New Delhi.
2. Pruthi, J.S.2001 Minor Spices and Condiments-Crop Management and Post-Harvest Technology, ICAR, New Delhi, India.
3. Amar Singh, 1986. Fruit Physiology and Production. Kalyani Publishers, New Delhi.
4. Bose, T.K, Mitra, S.K. and Sanyal, D. 2002. Fruits: Tropical and Subtropical. Vol. I & II, Nayaprakash publications, Calcutta.
5. Hayes, W.B.1957. Fruit Growing in India. Kitabitan, Allahabad.
6. Kumar, N. 1997(6 Edition).Introduction to Horticulture. Rajhalakshmi Publications, Nagercoil.
7. Mitra, S.K, Bose,T. K and Rathore, D.S. 1991. Temperate Fruits. Horticulture and Allied Publishers, Calcutta.

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. II

(Course - I) DSC– III B.Voc. Paper III

Fundamental of Agronomy &Fundamental of Horticulture (Practical)

(Credits: 02)

List of Experiments:

Group-I

1. Basic calculations for water management
2. Determination of soil moisture by thermo-gravimetric method
3. Determination of soil moisture by volumetric methods
4. Methods of irrigation-border strip, check basin, ring, and corrugation furrow
5. Drip and sprinkler irrigation, components, design aspects- Erection and operation of drip and sprinkler irrigation system;
6. Cost estimation of drip irrigation system; fertigation, injection and flushing of laterals.
7. To study Flushing system of irrigation system
8. Case study on one irrigation method.

Group-II

9. Study of different varieties of floricultural crops as per syllabus
10. To study different critical growth stages
11. To study measurement of infiltration rate
12. Study of water harvesting conservation
13. Visit to irrigation project / irrigation system
14. To study design different irrigation layouts
15. To study classification of water for irrigation suitability
16. Filed visit to playhouse / flower production unit

Reference Books:

1. Pruthi. J. S. 1993.Major Spices of India, Crop Management - Post Harvest Technology, ICAR, New Delhi.
2. Pruthi, J. S. 2001 Minor Spices and Condiments-Crop Management and Post Harvest Technology, ICAR Allahabad. New Delhi, India.
3. Amar Singh, 1986. Fruit Physiology and Production. Kalyani Publishers, New Delhi.
4. Bose, T. K, Mitra, S. K. and Sanyal, D. 2002. Fruits: Tropical and Subtropical. Vol. I & II, Nayaprakash publications, Calcutta.
5. Hayes, W. B.1957. Fruit Growing in India. Kitabitan.
6. Kumar, N. 1997(6th Edition). Introduction to Horticulture. Rajhalakshmi Publications, Nagercoil.

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. II

(Course - II) DSC– I B.Voc. Paper I
Principles of Food Processing – II
Theory: 30 hours
(Credits: 02)

Unit1: Ripening (8 hours)

Ripening and quality of fruits, harvesting and transportation, cold storage of fruits, selection and preparation of fruits for processing, enzyme inactivation, packing and processing. Use of PGRs.

Unit 2: Processing of Juice, Jam and Jelly (7 hours)

Fruit juice manufacture, Canning of fruit pulp, freezing of fruit pulps. Aseptic processing of fruit juices.

Unit 3: Packaging materials (8 hours)

Packaging materials qualities and characters of ideal containers Packaging of aseptically processed juices and pulps. Concentrated fruit juices.

Unit 4: Processing of vegetables (7 hours)

Manufacture of jams, jelly and candies, Formation, ingredients, Machinery for Jellies juice, ketchup, jams. Products of Amala and Strawberry.

Reference Books:

1. Siddappa and Bhatia, Fruits and Vegetable Processing Technology
2. Lea, R.A.W, Fruit juice processing and packaging
3. Hui, Y.H. Processing of fruits
4. Cash J. N. Processing of vegetables
5. Jongen, W. Fruit and vegetable processing

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. II
(Course - II) DSC– II B.Voc. Paper II
Plantation Crops: Spices and Medicinal plants – II
Theory: 30 hours
(Credits: 02)

Unit 1: Plantation crops (8 hours)

Introduction - importance - area, production - origin, distribution - botany, varieties- climate, soil, site selection - propagation, production of quality planting materials and hybrids- nursery management - layout, planting, aftercare - irrigation, manuring - stage of harvest, harvesting, yield and uses of :-Coconut and Rubber.

Unit 2: Spices (7 hours)

Definition – Classification importance to the state. Origin –distribution area, product varieties climate, soil - propagation, nursery management site selection, layout, planting crop management including manuring, irrigation, shade regulation, harvesting, yield of the following crops: ginger, and nutmeg.

Unit 3: Medicinal Plants (8 hours)

Definition– Classification importance to the state. Origin- distribution -area, production .varieties climate, soil - propagation, nursery management- site selection, layout, planting- crop management including manuring, irrigation, shade regulation, harvesting, yield of the following crops: Shatavari and Korphad.

Unit 4: Post Harvest Management (7 hours)

Crop management including manuring, irrigation, shade regulation, harvesting, yield of the following crops: Shatavari and Korphad.

Reference Books:

1. Pruthi.J.S. 1993.Major Spices of India, Crop Management – Post Harvest Technology, ICAR, New Delhi.
2. Pruthi, J.S.2001 Minor Spices and Condiments-Crop Management and Post-Harvest Technology, ICAR, New Delhi, India.
3. Amar Singh, 1986.Fruit Physiology and Production. Kalyani Publishers, New Delhi.
4. Bose, T.K, Mitra, S. K. and Sanyal, D. 2002. Fruits: Tropical and Subtropical. Vol. I & II, Nayaprakash publications, Calcutta.
5. Mitra, S. K, Bose, T. K and Rathore, D.S. 1991. Temperate Fruits. Horticulture and Allied Publishers, Calcutta.
6. Naik, K. C. 1949. South Indian Fruits and Their Culture. Varadachari Co., Madras.
7. Samson, J. A. 1980. Tropical Fruits. Longman group, London.

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. II

(Course - II) DSC– III B.Voc. Paper III

Principles of Food Processing &Plantation Crops, Fruits Spices and Medicinal plants (Practical)

(Credits: 02)

List of Experiments:

Group-I

1. Introduction of Agronomical Crops
2. Introduction of Horticultural Crops
3. Introduction of Spices Crops
4. Introduction of Medicinal Plants
5. Study of Maturity Indices of different Crops
6. Study of Harvesting Index, Critical Growth Stages of different Crops
7. Study procedure for preparation of Jam, Jelly, and Marmalade etc.
8. Case studies / review writing each (Spices)

Group-II

9. Study of preparation of Ginger powder.
10. Study of herbals used in Ayurvedas or Processed Products
11. Nursery management of Spice crop
12. Processing and curing techniques of Ginger
13. Study of morphology different spices
14. Study of morphology different medicinal plant
15. Tapping and processing of rubber
16. Case studies / review writing each (Medicinal plant)

Reference Books:

1. Pruthi .J. S. 1993.Major Spices of India, Crop Management - Post Harvest Technology, ICAR, New Delhi.
2. Pruthi, J.S.2001 Minor Spices and Condiments-Crop Management and Post Harvest Technology, ICAR, New Delhi, India.
3. Amar Singh, 1986. Fruit Physiology and Production. Kalyani Publishers, New Delhi.
4. Bose, T.K, Mitra, S. K. and Sanyal, D. 2002. Fruits: Tropical and Subtropical. Vol. I & II, Nayaprakash publications, Calcutta.
5. Mitra, S. K, Bose, T. K and Rathore, D.S. 1991. Temperate Fruits. Horticulture and Allied Publishers, Calcutta.
6. Naik, K. C. 1949. South Indian Fruits and Their Culture. Varada Chari Co., Madras.

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B. Voc. I (Sustainable Agriculture) Sem. II

(Course - III) DSC– I B.Voc. Paper I

Fundamental of Seed Technology and IPR

Theory: 30 hours

(Credits: 02)

Unit 1: Principles of Seed Technology (8 hours)

Introduction to Seed Production, Importance of Seed Production, seed- definition- structure of a seed- seed development process, Definition, Characters of good quality seed, Factors affecting seed quality - ecological influences, packing practices, harvest and post harvest handling, Genetic 22 and agronomic principles of seed production.

Unit 2: Seed Quality Assessment (7 hours)

Seed testing procedures for quality assessment- Physical, Purity, germination and viability test, Principles of establishing a seed testing laboratory.

Unit 3: Plant genetic resources (8 hours)

Conservation and utilization. Biodiversity Act and its Implications, Exchange of germplasm, Material Transfer Agreement International treaties on plant genetic resources.

Unit 4: Intellectual property rights (7 hours)

IPR- definition, concepts, and components.-Plant breeder's rights and farmers rights. UPOV, PPV and FR act. Plant variety registration

Reference Books:

1. Albert F- HillandO.P.Sharma, 1996. Economic Botany. Tata Mc Graw Hill Publishing Company Ltd., New Delhi
2. Chalam, G. V., J.Venkateswarlu.1966.AgriculturalBotanyinIndia-Vol. Asia publishing house, Bombay, New Delhi
3. Daniel Sundararaj, D and G. Thulasidas, 1993. Botany of field crops. Macmillan India Ltd., New Delhi
4. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons INC. USA. Toppan Co. Ltd. Japan
5. Choudhari, T.C. 1982. Introduction to Plant Breeding. Oxford A& IBH Publishing Co., New Delhi

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. II
(Course - III) DSC– II B.Voc. Paper II
Fundamental of Plant Breeding & Plant Physiology
Theory: 30 hours
(Credits: 02)

Unit 1: Principles of plant breeding (8 hours)

Aims, objectives and importance of Plant Breeding; Modes of reproduction, Sexual, Asexual, Apomixes and their classification; Modes of pollination, genetic consequences, differences between self and cross pollinated crops; Methods of breeding introduction and acclimatization. Selection, Mass selection, Johnson's pure line theory.

Unit 2: Hybridization (7 hours)

Aims and objectives, types of hybridization; Breeding objectives and concepts of breeding in self pollinated, cross pollinated and vegetative propagated crops. Breeding of Cereals – Rice. Pulses- Cowpea. Oil seeds-Groundnut. Vegetables- Tomato. Fruit crops- Mango. Plantation crops - Coconut.

Unit 3: Principles of genetics (8 hours)

Mendel's laws of inheritance and exceptions to the laws, Types of gene action, Multiple alleles, Pleiotropism, Penetrance and expressivity; Quantitative traits and Qualitative traits; Multiple factor hypothesis: Cytoplasmic inheritance - important features and difference from chromosomal inheritance.

Unit 4: Plant photosynthesis and respiration (7 hours)

Definition photosynthesis, Concept of photosynthesis- C_2, C_3 C_4 and CAM cycle, Significance of Photosynthesis, Types of respiration and Mechanism of stomata.

Reference Books:

1. Sharma, J.R. 1989. Principles and Practice of Plant Breeding. Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Singh, B. D. 2001.Fundamentals of Genetics. Kalyani Publishers. New Delhi. Ludhiana
3. Singh, B.D. 2003. Plant Breeding Principles and Methods. Kalyani Publishers. New Delhi/ Ludhiana.
4. Agrawal, R.L.1995. *Seed Technology*. Oxford, IBH Publishing Co., New Delhi.
5. Bose, T. K.and Som, M.G.1990.Vegetable crops in India. Naya Prokash, Calcutta.
6. Das, P. C. 1993. Vegetable crops in India. Kalyani Publishers

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B. Voc. I (Sustainable Agriculture) Sem. II

(Course - III) DSC– III B.Voc. Paper III

Fundamental of Seed Technology & Fundamental of Plant Breeding & Plant Physiology (Practical)

(Credits: 02)

List of Experiment:

Group-I

1. Introduction to field crops and agricultural classification of field crops.
2. Observing general morphology of roots, stem, leaves, inflorescence, flowers
3. Family characters and Botany and economic parts of the crop plants
4. Floral morphology, selfing, emasculation and crossing technique
5. Physical purity analysis of seeds
6. Seed Testing: Germination analysis and viability analysis of seeds
7. Seed dormancy and breaking methods
8. Case study on- Plant Breeding

Group-II

9. Seed extraction techniques
10. Repot on seed production plots
11. Seed extraction techniques
12. To study seed moisture content
13. To study seed ash content
14. Visit to seed processing unit
15. Visit to seed testing laboratories.
16. Case study on- Seed Dormancy

Reference Books:

1. Sharma, J.R. 1989. Principles and Practice of Plant Breeding. Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Singh, B. D. 2001.Fundamentals of Genetics. Kalyani Publishers. New Delhi. Ludhiana
3. Singh, B.D. 2003. Plant Breeding Principles and Methods. Kalyani Publishers. New Delhi/ Ludhiana.
4. Agrawal, R.L.1995. *Seed Technology*. Oxford, IBH Publishing Co., New Delhi.
5. Bose, T. K.and Som, M.G.1990.Vegetable crops in India. Naya Prokash, Calcutta.
6. Das, P. C. 1993. Vegetable crops in India. Kalyani Publishers

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B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Sustainable Agriculture) Sem. II

OPEN ELECTIVE - II

Organic Composting (Practical)

Credits: 02

List of Experiments:

Group-I

1. Preparation of compost
2. Preparation of liquid farm yard manure
3. Study of *Rhizobium*
4. Study of BGA (*Nostoc*)
5. Preparation of FYM
6. Identification of green manure species

Group-II

7. Preparation of Jeevamrut
8. Study of pit composting
9. Study of heap composting
10. To study difference between aerobic and anaerobic composting
11. To study pH and Humidity of different soil sample
12. Field visit to composting / biofertilizer unit

Reference Books:

1. Lenka, D. 2001. *Green manuring*. Kalyani Publishers, New-Delhi.
2. Mal, B.C.2002.*Introductionto Soil and Water Conservation Engineering*, Kalyani Publishers, New-Delhi.
3. Michael, A. MandOjha, T.P.2005. *Principles of Agricultural Engineering*- Vol.II. Jain Brothers, New Delhi.
4. Michael, A.M.1988.*Irrigation Theory and Practice*. Vikas Publishing House Pvt.Ltd, New Delhi.

शिवाजी विद्यापीठ, कोल्हापूर

बी. व्होक. भाग १ (शाश्वत शेती) राष्ट्रीय शैक्षणिक अभ्यासक्रम २०२० (२.०) जून २०२५ पासून अभ्यासक्रम

बी. व्होक. भाग १ (शाश्वत शेती) सत्र २

वैकल्पिक विषय- २

सेंद्रिय खते (प्रात्यक्षिक)

(क्रेडिट: ०२)

प्रात्यक्षिक यादी

गट-I

१. कंपोस्ट तयार करणे

२. द्रव शेतातील खत तयार करणे

३. रायझोबियमचा अभ्यास

४. बीजीए (नोस्टॉक)चा अभ्यास

५. शेणखत तयार करणे

६. हिरव्या खताच्या प्रजातींची ओळख

गट-II

७. जीवामृत तयार करणे

८. खड्ड्यात कंपोस्टिंगचा अभ्यास

९. ढीग कंपोस्टिंगचा अभ्यास

१०. एरोबिक आणि ॲनारोबिक कंपोस्टिंगमधील फरक अभ्यासणे

११. वेगवेगळ्या मातीच्या नमुन्यांचा पीएच आणि आर्द्रता अभ्यासणे

१२. कंपोस्टिंग / जैवखत युनिटला क्षेत्र भेट देणे

Course Outcomes:

- Students will be able to explain the scientific principles of organic waste decomposition and nutrient recycling.
- Students are able to various composting techniques such as aerobic, anaerobic, vermicomposting, and pit/heap methods.
- Students understand the role of organic compost in enhancing soil fertility, structure, microbial activity, and sustainability.
- Students acquire hands-on experience in preparing, maintaining, and monitoring compost pits/units.
- Students are able to understand different Insects their classifications.
- Students are able to understand control measures for insects
- Students are able to understand increasing shelf life of processed products.
- Students are practically experiential learning of different insects attack on horticultural and agricultural crop.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part I (Sustainable Agriculture) NEP 2020 (2.0)
Semester – I & II
Nature of a Question Paper

Time: 1:00 Hr **Total Marks: 30**

Solve questions from the following.

Q. 1 Multiple choice Question **06 Marks**

i.
ii.
iii.
iv.
v.
vi.

Q. 2 Long answer Question (Any Two out of three **12 Marks**

i.
ii.
iii.

Q. 3 Short Answer Questions (Any Four out of six) **12 Marks**

i.
ii.
iii.
iv.
v.
vi.

Internal Assessment **20 Marks**

Home Assignment
Class Assignment (Tutorial Type)
Quiz
Mid-Term Test

Nature of Practical Question Paper

Internal practical examination	**50 marks**
1. Group I	20 Marks
2. Group II	20 Marks
3. Submission of Certified Journal	10 Marks

Assessment:

The NEP 2020 emphasizes upon formative and continuous assessment rather than summative assessment. Therefore, the scheme of assessment should have components of these two types of assessments. Assessment has to have correlations with the learning outcomes that are to be achieved by a student after completion of the course

a) **Continuous Assessment:** Assignments, projects, presentations, seminars and quizzes
b) **Examinations:** Midterm, finals, or comprehensive exams.
c) **Research Projects/Dissertation/Thesis:** Evaluated through submission and viva-voce
d) **Grading System:** Standardized letter grades, percentages, or CGPA

Letter Grades and Grade Points:

The Semester Grade Point Average (SGPA) is computed from the grades as a measure of the student's performance in a given semester. The SGPA is based on the grades of the current term, while the Cumulative GPA (CGPA) is based on the grades in all courses taken after joining the programme of study. The HEIs may also mention marks obtained in each course and a weighted average of marks based on marks obtained in all the semesters taken together for the benefit of students.

Computation of SGPA and CGPA: UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

Letter Grade	Grade Point
O (Outstanding)	10
A+ (Excellent)	9
A (Very Good)	8
B+ (Good)	7
B (Above Average)	6
C (Average)	5
P (Pass)	4
F (Fail)	0
Ab (Absent)	0

1. The SGPA is the ratio of the sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$\textbf{SGPA } (S_i) = \frac{\sum (C_{ix} G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i^{th} course and G_i is the grade point scored by the student in the i^{th} course.