

SHIVAJI UNIVERSITY, KOLHAPUR



“A” Re accredited by NAAC
(2014) with CGPA 3.16

**Faculty of Interdisciplinary Studies
Structure, Scheme and Syllabus for
Bachelor of Vocation (B. Voc.)**

Sustainable Agriculture Management

Part I- Sem. I & II

(Subject to the modifications that will be made from time to time)
Syllabus to be implemented from June, 2018 onwards.

SHIVAJI UNIVERSITY, KOLHAPUR

STRUCTURE AND SYLLABUS OF B.VOC.

Bachelor of Vocation (B.Voc.) – Sustainable Agriculture Management.

- TITLE** : B.Voc. (Sustainable Agriculture Management)
Syllabus (Semester Pattern)
Under Faculty of Interdisciplinary Studies
- YEAR OF IMPLEMENTATION:** Syllabus will be implemented from August, 2018
- DURATION** : B. Voc. Part I, II and III (Three Years)
B. Voc. Part I - Diploma (One Year)
B. Voc. Part II - Advanced Diploma (Second Year)
B. Voc. Part III – Degree (ThirdYear)
- PATTERN OF EXAMINATION :** Semester Pattern
- **Theory Examination** - At the end of semester as per Shivaji University Rules
 - **Practical Examination** -
 - i) In the 1st, 3rd and 5th semester of B.Voc. there will be internal assessment of practical record, related report submission and project reports at the end of semester
 - ii) In the second semester of B. Voc. I, there will be internal practical examination at the end of semester
 - iii) In the 4th and 6th semester of B. Voc. there will be external practical examination at the end of semester
- MEDIUM OF INSTRUCTION :** English.
- STRUCTURE OF COURSE :** B. Voc. Part – I, II and III.
Two Semester Per Year, Two General Papers per year / semester
Three Vocational Papers per Year / Semester
Three Practical papers per Year / Semester.
- SCHEME OF EXAMINATION :**
- A) THEORY-**
- The theory examination shall be at the end of the each semester.

- All the general theory papers shall carry 40marks and all vocational theory papers shall carry 50marks.
- Evaluation of the performance of the students in theory shall be on the basis of semester examination as mentioned above.
- Question paper will be set in the view of entire syllabus preferably covering each unit of the syllabus.

- **Nature of question paper for Theory examination (Excluding Business Communication Paper)**

i) There will be seven questions carrying equal marks.

ii) Students will have to solve any five questions

Que. No. 1 : Short answer type question with internal choice (Two out of Three)

Que. No. 2 to Que. No. 6: Long answer type questions.

Que. No. 7 : Short Notes with internal choice (Two out of Three)

B) PRACTICALS:

Evaluation of the performance of the students in practical shall be on the basis of semester examination (Internal assessment at the end of Semester I, II and III and V and external examination at the end of Semester IV and VI as mentioned separately in each paper

Standard of Passing:

As per the guidelines and rules for B. Voc. (Attached Separately – Annexure I)

Eligibility Criteria:

1. The Eligibility for admission is 10+2 or equivalent, in any stream (Arts/Commerce/Science) from any recognized board or University.
 2. The candidates after with 10+2 year ITI course in any branch/trade also eligible for course.
 3. The candidates graduate from any faculty or engineering degree/diploma holders are also eligible.
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Structure of the Course:

B. Voc. -I (Diploma) Semester -I

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	I	Business Communication- I	Theory/ Practical	50	40	10	3	2
2	II	Soil Science for Agricultural Management	Theory/ Practical	50	40	10	3	2
3	III	Fundamentals of Agronomy	Theory	50	50	-	3	
4	IV	Horticulture and Biodiversity conservation	Theory	50	50	-	3	-
5	V	Introductory Agricultural Economics	Theory	50	50	-	3	-
6	VI	Laboratory Work- Fundamentals of Agronomy	Practical	50	-	50	-	3
7	VII	Laboratory Work- Horticulture & Biodiversity Conservation	Practical	50	-	50	-	3
8	VIII	Laboratory Work- Agricultural Economics	Practical	50	-	50	-	3
9	IX	Project/ Industrial Visit / Nursery visit/ Study Tour.		50	-	50	-	2

B. Voc. –I (Diploma) Semester –II

Sr. No.	Paper No.	Title	Theory /Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	X	Business Communication- II	Theory/ Practical	50	40	10	3	2
2	XI	Fertilizer & Pesticide : Sustainable approaches	Theory/ Practical	50	40	10	3	2
3	XII	Alternative Green Technologies Supporting Agriculture	Theory	50	50	-	3	
4	XIII	Nursery Management	Theory	50	50	-	3	-
5	XIV	Agricultural Business Management	Theory	50	50	-	3	-
6	XV	Lab. Work- Alternative green technologies supporting agriculture & soil management	Practical	50	-	50	-	3
7	XVI	Laboratory Work- Nursery Management	Practical	50	-	50	-	3
8	XVII	Laboratory Work- Agricultural Business Management	Practical	50	-	50	-	3
9	XVIII	Project/ Industrial Visit /Nursery Visit/ Study Tour.		50	-	50	-	2

Scheme of Teaching: B. Voc. – Part I (Diploma) Semester – I

Sr.No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	I	Business Communication- I	4	2	6
2	II	Soil Science for Agricultural Management	4	2	6
3	III	Fundamentals of Agronomy	4	-	4
4	IV	Horticulture and Biodiversity conservation	4	-	4
5	V	Introductory Agricultural Economics	4	-	4
6	VI	Laboratory Work- Fundamentals of Agronomy	-	4	4
7	VII	Laboratory Work-Horticulture and Biodiversity Conservation	-	4	4
8	VIII	Laboratory Work-Agricultural Economics	-	4	4
9	IX	Project/ Industrial Visit/ Nursery Visit / Study Tour.	-	-	-
			20	16	36

B. Voc. - Part-I (Diploma) Semester – II

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	X	Business Communication- II	4	2	6
2	XI	Fertilizer & Pesticide : Sustainable approaches	4	2	6
3	XII	Alternative green technologies supporting agriculture	4	-	4
4	XIII	Nursery Management	4	-	4
5	XIV	Agricultural Business Management	4	-	4
6	XV	Laboratory Work- Alternative Green Technologies Supporting Agriculture.	-	4	4
7	XVI	Laboratory Work- Nursery Management	-	4	4
8	XVI I	Laboratory Work-Agricultural Business Management	-	4	4
9	XVI II	Project/ Industrial Visit / Nursery visit/ Study Tour.	-	-	-
			20	16	36

Eligibility for Admission

10 + 2 from any faculty or equivalent Diploma /Advanced

Diploma in any related stream

Eligibility for Faculty

M.Sc./M.B.A.(Agri., Horticulture, Agri. Economics, Agri Business Management, Plant Pathology, Agri. Engineering, Agri. Extension)with NET / SET/Ph.D. M. A (English) with NET/SET for Business Communication

Eligibility for Laboratory Assistant:

B.Sc.(Agri.)/ Diploma in Agriculture

Staffing Pattern

: In 1st Year of B. Voc. - 1 Full Time and 1 Part Time Lecturer and 1 CHB Lecturer for Business Communication

Laboratory Assistant

: For 1st Year of B. Voc. - 1 Part-time

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - I
Sustainable Agriculture Management
Paper – I: Business Communication-I
Total Workload: 06 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week
 Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

Marks:40

Unit- I: Use of English in Business Environment.

Business Vocabulary: Vocabulary for banking, marketing and for maintaining public relations.

What is a sentence? Elements of a sentence.

Types of sentence: Simple, compound, complex.

Unit- II: Writing a Letter of Application and CV/Resume

Structure of a letter of application for various posts CV/

Resume and its essentials

Unit- III: Presenting Information / Data.

Presenting information/data using graphics like tables, pie charts, tree diagrams, bar diagrams, graphs, flowcharts

Unit - IV: Interview Technique

Dos and don'ts of an interview preparing for an interview

Presenting documents Language used in an interview

Practical: Based on the theory units:

Marks: 10

Reference Books:

- Sethi, Anjane & Bhavana Adhikari. *Business Communication*. New Delhi: Tata McGraw Hill Tickoo, Champa & Jaya Sasikumar. *Writing with a Purpose*. New York: OUP, 1979.
- Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.
- Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
- Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publi. 2003.

Pattern of a Question Paper

B. Voc. Part-I

Business Communication-I

Semester-I Paper: I

Time: 2 hours

Total Marks: 40

Q.1 Do as directed. Question items on **Unit 1** to be asked. (10 out of 12) 10

Q.2 Write a letter of application. 10

OR

Draft a CV/ Resume for a particular post.

Q.3 Present given information or data using a table/chart/pie diagram, etc. 10

(Any one diagram to be drawn.)

Q.4 Fill in the blanks in the given interview. 10

Practical Evaluation:

Marks: 10

Oral and Presentation based on the units prescribed.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - I
Sustainable Agriculture Management
Paper -II: Soil Science for Agricultural Management
Total Workload: 06 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week
Practical: 02 lectures per week per batch of 20 students
Total Marks: 50 Marks (Theory 40 + Practical 10)

Objectives:

- To study the fundamentals of soil and various types, classification of soils.
- To understand the formation of soil

UNIT -I

Soil Science: Introduction, soil forming factors, parent material, characteristics of soil, Classification, Organic matter and humus.

Minerals: Definition, and classification mineral composition of rocks, physical properties of minerals chemical properties, silicate class, carbonate class, sulphide, phosphate, element class, organic halide oxide class.

UNIT-II

Field of study: Research mapping land based treatment of wastes identification and protection of environmentally critical areas, management of optimum land productivity, remediation and restoration of damaged lands, optimum water quality, remediation and restoration of damaged land fields of application in soil science.

UNIT-III

Soil fertility: soil fertilization light and CO₂ limitation, soil depletion, humus and humification. Benefits of soil organic matter, and humus, Biomass, sources chemical, Biochemical conversion Environmental impact.

UNIT-IV

Soil pH: Importance, Nutrient availability in relation to soil pH, factors affecting soil pH, soil life and soil pH and plant diseases, quick lime and slaked lime, reducing soil pH, example and plant books.

Soil conservation: Erosion prevention salinity management soil micro-organisms mineralization.

Reference Books:

1. A Text Book of Soil Science – Indian Society of Soil Science
2. The Nature and Properties of Soils – Brady N.C.
3. ICAR.2006. *Hand book of Agriculture*, ICAR, New Delhi.
4. Introductory Soil Science – Dilip Kumar Das.
5. Indian Agriculture and Agribusiness Management (3rd Edition) by Dr Smita Diwase.
6. Restoration Agriculture: Real-world Permaculture for Farmers, by Mark Shepard.

Soil Science for Agricultural Management - I (Practical)

Marks: 10

Objectives:

- To study the different soil sample analysis.
 1. Determination of Water holding capacity of soil.
 2. Study of soil profile in field.
 3. Study of soil sampling tools.
 4. Collection of representative soil sample, its processing and storage.
 5. Study of soil forming rocks and minerals.
 6. Determination of soil pH and electrical conductivity.
 7. Determination of soil colour.
 8. Estimation of organic matter content of soil.

Reference Books:

1. Principle and Practices of soil science – R E White.
2. Soil science & management - Book by Edward J. Plaster.
3. Soil Minerals by Trotter Brown, Publisher: Zealand Publishing House
4. Essential Soil Science: A Clear and Concise Introduction to Soil Science
by Geeta Puri and Mark Ashman.

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Sustainable Agriculture Management
Paper - III: Fundamentals of Agronomy
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week.

Total Marks: 50 Marks.

Objectives:

- To acquire knowledge of Agronomy.
- To know the importance of seed, plant nutrients and irrigation to crops.

UNIT – I: Introduction to Agronomy

Agronomy and its scope. Classification of Crops on different basis. Agronomic classification of crops. Importance of Indian Agriculture. Commercial agriculture, sustainable agriculture seasons in India.

UNIT- II: Soils & Tillage

Soils and tillage - sustainable crop production. Principle of agronomy - Physical Properties of Soil, Chemical Properties of Soil, Biological Properties of Soil, Soil Organic Matter, Salt Affected Soils, and Tillage.

UNIT-III: Soil and Water Conservation

Principles of Soil Erosion, Water Erosion, Wind Erosion, Soil and Water Conservation Measures.

UNIT-IV: Irrigation and Water Management

Importance of water in crop production. Soil Moisture constants. Estimation of potential evapo-transpiration and consumptive use. Water requirement of crops and factors affecting it. Approaches of irrigation scheduling. Systems and methods of irrigation – drip, sprinkler and mist Irrigation. Quantity and quality of irrigation. Measurement of irrigation water. Elementary idea of drainage on farms.

Reference Books:

1. De, G.C. 1989. *Fundamentals of Agronomy*. Oxford & IBH Publishing Co., New Delhi.
2. ICAR. 2006. *Hand book of Agriculture*, ICAR, New Delhi.
3. Reddy. T. Y and Reddy, G.H.S. 1995. *Principles of Agronomy*, Kalyani Publishers, Ludhiana.
4. Manures and Fertilizers- K. S. Yawalkar, J. P. Agrawal and S. Bokde
5. Principles of New Agronomy by T.Y. Reddy and Reddy, Kalyani Publications.

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Sustainable Agriculture Management
Paper-IV: Horticulture & Biodiversity conservation
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week.

Total Marks: 50 Marks.

Objectives:

- To understand vegetative propagation, orchard management.
- To know the various operations carried out in orchard.
- To study the conservation of biodiversity.

UNIT- I: Importance of Horticulture

Horticulture- its definition and branches, Importance and scope, Selection of site for fruit growing, Horticultural and Botanical classification, Fruit Zones of Maharashtra.

UNIT-II: Indian Horticulture

Indian Horticulture, various crops taken in India. Climate & Weather Requirement & there economic importance. Geographical Importance & Topographical change.

UNIT-III: Pomology & Floriculture

Pomology refers to cultivation of fruits & Floriculture refers to cultivation of flowers. The method of cultivation & intercultural operations & tillage practices.

UNIT-IV Biodiversity Conservation

Objectives and advantages of biodiversity conservation, Types of conservation, convention of biological diversity, major cause for diversity loss, Social Issues and Environment, and Natural Resources. Biodiversity includes the genetic variability, and diversity of life forms such as plants, animal microbes, living in a wide range of ecosystems & their conservation.

Reference Books:

1. Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York.
2. Hartmann, HT. and Kester, DE. 1986. *Plant propagation - Principles and practices*. Prentice-Hall, New Delhi.
3. Chadha, K. L. 2003. *Handbook of Horticulture*, ICAR, New Delhi. Choudhury, B. 1983. *Vegetables*. National Book Trust, New Delhi.
4. *Biodiversity conservation: 101*, by Amelia Chiles, Eleanor J. Sterling, Georgina Cullman, and Melina Laverty
5. *Exploring Agrodiversity* -Book by H. Brookfield and Harold Brookfield.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Sustainable Agriculture Management
Paper-V: Introductory Agricultural Economics
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week.
Total Marks: 50 Marks.

Objectives:

- To demonstrate a basic knowledge of the principles of economics and their application to agricultural problems.
- To demonstrate a basic knowledge of the role of agriculture in the India and world economies.

UNIT- I:Principles of Economics

Production Principles, Production Costs, Supply and Revenue. Principles of Profit Maximization and Loss Minimization. Principles of Consumption and Demand. Price Elasticity Concepts. Principles of Market Price Determination. Competitive vs. Non-Competitive Market Models

UNIT-II: Marketing Food and Agricultural Products

Functional and Institutional Approaches to Marketing. Costs of Marketing Food and Agricultural Products. Operation of the Futures Markets. Agricultural Economics as a Social Science. Structure of Agriculture Sectors

UNIT- III:Agricultural Problems and Policy Analysis.

Goals and Policies and Programs. Price and Income. Resource Use. Land Economics, Locally Grown Foods.

UNIT-IV:Global Issues

Population Growth. World Food Production Trends. Trade in Agricultural Products. The Role of Agriculture in Economic Growth.

Reference Books:

1. Agricultural Economics and Agribusiness, Cramer, Jensen, and Southgate, John Wiley.
2. Agricultural Economics, Drummond and Goodwin, Prentice Hall.
3. Introduction to Agricultural Economics, Penson, Capps, and Rosson, Prentice Hall.
4. Economics of Resources, Agriculture and Food, Seitz, Nelson, Halcrow
5. A Textbook of Agricultural Economics Paperback – 2011
by C.B. Singh (Author), R.K. Singh (Author)
6. Economic Reform, Trade and Agricultural Development Paperback – Import, 1 Jan 1993
by Ian A. Goldin (Editor)

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Sustainable Agriculture Management
Paper-VI: Laboratory work -Soil Science and Agronomy (Practical)
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

Objectives:

- To analysis, learn & study importance and types of soil

Practicals:

1. Soil and Water pH calculation by using pH paper and universal indicator/meter.
 2. Soil humus studies.
 3. Soil Sampling procedure & preparations of samples.
 4. Layout making.
 5. Seed calibration & sowing.
 6. Seed germination and viabilities test.
 7. Intercultural operation of various crops.
 8. Types of fertilizers.
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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Sustainable Agriculture Management
Paper- VII: Laboratory work - Horticulture (Practical)
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Practical - 04 lectures per week per Batch

Total Marks: 50 Marks. (Practical 50)

Objectives:

- To make perfect techniques for learners & study horticultural practices & cultivation methods.

Practicals:

1. Prepare a chart of nutritional importance of plants.
2. Major horticultural plants in local area.
3. Plant Pruning Techniques.
4. Vegetative propagation by Layering.
5. Vegetative propagation by Grafting and Budding.
6. Layout making.
7. Intercultural operation of various crops.
8. Study of weather and weather forecasting.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Sustainable Agriculture Management
Paper- VIII: Laboratory work - Agricultural Economics (Practical)
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week per Batch.

Total Marks: 50 Marks. (Practical 50)

Objectives:

- In Agricultural economics, examine Indian agriculture economy.

Practicals:

1. Market Survey.
2. Input Marketing.
3. Output Marketing.
4. Consumer Behavior
5. Estimation of price elasticity.
6. Calculation of fertilizer requirement, fertilizer mixtures and unit values.

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Sustainable Agriculture Management
Paper- IX: Project/ Field Visit/ Crop Museum/ Nursery Visit/ Agriculture Mall Visit.
Total Marks:50 Marks

Some specimen of modified crop varieties of Sorghum, Millet, Nuts, Chilies, Beans etc. should be collected and data of the relevant species including cultivation and harvesting techniques are to collected and displayed with proper scientific preservation and knowledge. This work should be completed within a span of year.

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - II
Sustainable Agriculture Management
Paper – X: Business Communication-II
Total Workload: 06 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week
Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

Marks: 40

Unit- I: Group Discussion

Preparing for a Group Discussion
Initiating a Discussion
Eliciting Opinions, views etc. Expressing Agreement /Disagreement
Making Suggestions; Accepting and Declining Suggestions
Summing up.

Unit- II: Business Correspondence

Writing Memos, e-mails, complaints, inquiries, etc.
Inviting Quotations Placing Orders, Tenders, etc

Unit- III: English for Negotiation.

Business Negotiations
Agenda for Negotiation
Stages of Negotiation

Unit - IV: English for Marketing

Describing/Explaining a Product/Service
Promotion of a Product
Dealing/ bargaining with Customers
Marketing a Product/Service: Using Pamphlets, Hoardings,
Advertisement, Public Function/Festival

Practical: Based on the theory units

Marks: 10

Reference Books:

- Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
- Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
- John, David. *Group Discussions*. New Delhi: Arihant Publications.
- Kumar, Varinder. *Business Communication*. New Delhi: Kalyani Publishers, 2000.
- Pardeshi, P. C. *Managerial Communication*. Pune: Nirali Prakashan, 2008.
- Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005.
- Rai, Urmila & S. M. Rai. *Business Communication*. Mumbai: Himalaya Publishing House, 2007.
- Sethi, A. & B. Adhikari. *Business Communication*. New Delhi: Tata McGraw Hill.
- Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.
- Tickoo, Champa & Jaya Sasikumar. *Writing with a Purpose*. New York: OUP, 1979.
- Whitehead, Jeffrey & David H. Whitehead. *Business Correspondence*. Allahabad: Wheeler publishing 1996

Pattern of a Question Paper

B. Voc. Part-I, Semester-II
Paper-X: Business Communication-II

Time: 2 hours

Total Marks: 40

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|------|--|----|
| Q. 1 | Fill in the blanks in the following Group Discussion.
(On Unit 5) (10 out 12) | 10 |
| Q. 2 | Attempt ANY ONE of the following (A or B):
(On Unit 6) | 10 |
| Q. 3 | Fill in the blanks with appropriate responses:
(On Unit 7) | 10 |
| Q. 4 | Attempt ANY ONE of the following (A or B):
(On Unit 8) (10 out 12) | 10 |

Practical Evaluation:

Marks: 10

Oral and Presentation based on the units prescribed.

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - II
Sustainable Agriculture Management
Paper -XI: Fertilizers and Pesticides: sustainable organic approaches.
Total Workload: 06 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week
Practical: 02 lectures per week per batch of students
Total Marks: 50 Marks (Theory 40 + Practical 10)

Objectives:

- To understand information regarding importance & uses of fertilizers & pesticides.

UNIT-I: Fertilizers

Introduction, Need and types of fertilizers, uses. Basic chemistry of fertilizers. National and international status and approaches of development of fertilizers.

UNIT-II: Biofertilizer

Methods of development of biofertilizers technology transfer projects for development of biofertilizers. Types of biofertilizer.

UNIT-III: Pesticides

Introduction, types of pesticides status, and approaches. Biopesticides: Introduction Advantage, types of Biopesticides. Trends and opportunities: Agrochemical management and manufacturing.

UNIT-IV: Trends and opportunities

Agrochemical management and manufacturing. Various agrochemical brands, classification, types & uses. Equipments used for using chemicals which includes in liquid, soil application, water soluble, powder forms.

Reference Books:

1. Agrochemicals Desk Books By John Montgomery.
2. Agrochemicals, Composition, production, toxicology, application.
By- Franz Muller
3. Agrochemical; Preparation and Mode of action By- R.J.Cremlyn.

Fertilizers and Pesticides: sustainable organic approaches (Practical) Marks: 10

Objectives:

- To familiarize the students with biofertilizers and Biopesticides.

1. Studying types of Fertilizers.
2. Chemistry of fertilizers.
3. Biofertilizers: Types Development.
4. Survey of availability of pesticides in Market.
5. Biopesticides: Types of biopesticides.

Reference Books:

1. Agrochemicals Desk Books By John Montgomery.
2. Agrochemicals, Composition, production, toxicology - Franz Muller

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - II
Sustainable Agriculture Management
Paper-XII: Alternatives Green Technologies Supporting Agriculture
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week

Total Marks: 50 Marks.

Objectives:

- To familiarize sericulture, apiculture and to enhance the importance towards modern agricultural techniques.

UNIT-I: Sericulture

Introduction, characteristics of silkworm moth, silk worm breeding mulberry cultivation, production of non mulberry silks, Sericulture, development of silk production in India, Central silk board Act, 1948.

UNIT-II: Apiculture

Bee keeping-method, life cycle of honey bees, suitable species in Indigenous system, advantages as medicine, by-products, advantage for pollination of crops.

UNIT-III: Vermicomposting

Vermiculture-Introduction, Earthworm life cycle, the microbiology of vermicomposting vermitechnology. Advantage of vermiculture, vermicomposting, Earth worms end uses and potential.

UNIT-IV: Techniques of Mushroom cultivation

Introduction morphology of mushrooms, techniques of mushroom cultivation cultivation of edible mushrooms, Nutritive value and negative effect of mushrooms, marketing techniques.

Reference Books:

1. Green Technologies & Environmental: By Ritu Singh & Sanjeev Kumar
2. Vermitechnology: By M. Seethalekshmy & Dr. R. Santhi
3. The Cultivated Mushroom By- Chicago Bureau of Mushroom Industry
4. Mushroom Cultivation in India: By BC Suman & VP Sharma.
5. Plant Pathology: By George N. Agricos.
6. The Feminin Monarchi, or the Histori of Bees, Butler, Charles.
7. The True Amazons or the Monarchy of the Bees, Warder, J.
8. The Natural History of Bees, Their Production, Bazin, Gilles Augustin.
9. Collateral Bee Boxes or a New Easy and Advantageous Method, White, Rev Stephen.
10. 1765 The True Amazons or the Monarchy of the Bees, Warder, J.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - II
Sustainable Agriculture Management
Paper-XIII: Nursery Management
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Theory: 04 lectures per week

Total Marks: 50 Marks.

Objectives:

- To study aims, objectives & importance of Nursery Management for Sustainable Agriculture Management.

UNIT-I: Introduction to Horticulture Nursery.

Nursery Management, plant propagation methods, types, classification. Vegetative propagation methods. Tray cultivation and open farm growing bags. Growing of commercially crops which are available in local market

UNIT-II: Plant Nutrition.

Plant Nutrition Management in Nursery, plant protection in Nursery Management, Management practices in Horticulture. Nutritional importance of major and micro nutrients for nursery plantation. Types and uses for various chemical & organic fertilizers.

UNIT-III: Mass Production.

Mass Production of Nursery plants, Ornamental Horticulture Nursery. Commercial mass production of crops. Market values of nursery plants. Study of indoor & outdoor plant. Methods of growing nursery in/ out door plants

UNIT-IV: Government Regulations.

Government regulation norms and policies in Horticulture Nursery Management. Marketing planning for nursery products. Plant Library Concepts and Operations Economics. Methods and planning for Proper Nursery according to Government Policy.

Reference Books:

1. Plant Nursery Management- PK Ray
2. Plant Propagation & Nursery Management- Dr D.K. Sharma & Manish Srivastav
3. Essential Nursery Management- Susan Hay
4. Nursery Management & Plantation practices in Forestry- V Kumar
5. Management of Horticultural Crops- T Pradeep Kumar.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - II
Sustainable Agriculture Management
Paper-XIV: Agribusiness Management
Total Workload: 04 lectures per week of 60 min

Distribution of Workload:

Theory: 04 lectures per week

Total Marks: 50 Marks.

Objectives:

- Students will understand basic economic and business principles used in the agriculture industry, from production to retail.
- To provide exposure of the ethical dilemma in management practices.

UNIT-I: Scope and Importance of ABM.

Study importance and opportunities in production, finance, sales and land management. Agribusiness relations with the financing, marketing, and management of food production. It industrial career opportunities.

UNIT-II: Agricultural Finance.

Definition, nature, scope. Credit analysis, five Cs and even Ps credit. Method of processing loan application. Repayment plan. Recent trends in agriculture bank finance. Lead bank scheme. Crop loan system. Crop insurance scheme. Classification of co-operative credit institutions.

UNIT-III: Retail Agribusiness Sales.

Selling Environments, Relationship Building, Customer Satisfaction, The Pre-Sale, Sales Presentation, Retail Promotional Tools and Advertising, Customer Transactions, Retail operations.

UNIT-IV: Supply Chain Managements.

Recent Developments With Reference To Rural Economy. Importance of quality seeds in agriculture; principles and methods of seed production of cereals, pulses, oilseeds and miscellaneous field crops; principles of seed certification and certification agency, seed laws. Seed processing drying, cleaning, grading, treatment, weighing, bagging and handling of seeds; installation and management of seed processing plants- Seed storage; loss of seed viability during storage; seed packaging storing breeder, foundation and certified seeds; construction and seed stores: seed development and germination; principles and methods moisture, viability, genetic purity and seed health.

Reference Books:

1. Agribusiness Management–Freddie L. Dooley, John C. Foltz, E. A. Yeager
2. A Textbook of Agri-Business Management-A. C. Broadway, Arif A. Broadway
3. Principles of Agribusiness Management: By James G., B. Kenneth C. Osburn
4. Agribusiness Supply Chain Management: By N. Chandrasekaran, G. Raghuram
5. Cases in Agribusiness Management-James G. Beierlein.
6. Agricultural Financing in India-Ghosal, SN, Asia Publ. House, Bombay, 1966

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SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – I, Semester - II

Sustainable Agriculture Management

**Paper-XV: Laboratory work- Fertilizer and Pesticide - Sustainable organic approach
(Practical)**

Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Practical: 04 lectures per week per batch of students

Total Marks: 50 Marks. (Practical 50)

Objectives:

- To study & use of fertilizer & pesticides used for organic farming.

Practicals:

1. Studying types of Fertilizers.
 2. Chemistry of fertilizers.
 3. Biofertilizers: Types Development.
 4. Survey of availability of pesticides in Market.
 5. Biopesticides: Types, Identification of mineral deficiencies and pests.
 6. Study of fungicides and their formulations.
 7. General study of different structure of fungi.
 8. Collection of fertilizers.
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SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – I, Semester - II

Sustainable Agriculture Management

Paper-XVI: Laboratory work - Nursery Management (Practical)

Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Practical: 04 lectures per week per batch of students

Total Marks: 50 Marks (Practical 50)

Objectives:

- To understand planting material as an initial investment is a well realized factor for persons engaged in Horticulture field.

Practicals:

1. Plant propagation by seeds
2. Grafting, budding, air layering
3. Shade net development and management.
4. Ornamental plant development by cutting method
5. Vegetable seedling development
6. Identification of garden tools/ implements.
7. Potting and repotting techniques.
8. Preparation of seed bed/nursery bed.

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - II
Sustainable Agriculture Management
Paper-XVII: Laboratory work - Agribusiness Management (Practical)
Total Workload: 04 lectures per week of 60 min.

Distribution of Workload:

Practical: 04 lectures per week per batch of students

Total Marks: 50 Marks (Practical 50)

Objectives:

- To study including seeds, agrichemicals, breeding, crop production (farming and contract farming), distribution, farm machinery, processing, and seed supply, as well as marketing and retail sales.

Practicals:

1. Local market survey.
2. Benefit cost ratio.
3. Supply chain management.
4. Survey of local and exotic products.
5. Supply crop loans.
6. Crop insurance.
7. Agro product marketing.
8. Agro Exhibition.

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester - II
Sustainable Agriculture Management
Paper-XVIII: Project/ Field Visit/ Crop Museum/ Nursery Visit/ Agriculture Mall Visit.
Total Marks: 50 Marks

- Soil testing lab project, Green houses, Polythene house, Drip irrigation installation.
- Some specimen of modified crop varieties of Sorghum, Millet, Nuts, Chilies, Beans etc. should be collected and data of the relevant species including cultivation and harvesting techniques are to collected and displayed with proper scientific preservation and knowledge. This work should be completed within a span of year.

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