Devrukh Shikshan Prasarak Mandal's

Nya.Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce & Vid. Dadasaheb Pitre Science College Devrukh.

[Autonomous College]

SYLLABUS

Sr. No.	Heading	Particulars
1	Title of Course	B.Voc. Sustainable Agriculture First Year
2	Eligibility for Admission	10+2 (of recognized board)
3	Passing Marks	40%
4	Ordinances/Regulations (if any)	-
5	No. of Years/Semesters	Three years/ Six semester
6	Level	U.G.
7	Pattern	Semester
8	Status	New Syllabus
9	To be implemented from Academic year	2020-21

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Syllabus for F.Y. B.Voc.

Program: B. Voc. Sustainable Agriculture

Course: F.Y. B.Voc. Sustainable Agriculture

(Credit Based Grading and Semester System with effect from the academic year 2020-2021)

B.Voc Programme

The University Grants Commission (UGC) had launched a scheme for skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc) degree with multiple entry and exit points. The B.Voc program is focused on providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Voc to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge. The duration of the B. Voc courses will be six semesters in three Academic Sessions. At the end of each Semester, the candidates shall be required to present themselves for examination. The student who completes first semester successfully and is opting out from further education in B.Voc program, will be conferred Certificate in respective subject/trade. The student who completes first year i.e. first two semesters successfully and is opting out from further education in B.Voc program, will be conferred Diploma in respective subject/trade. Similarly, the student who completes first two years i.e. four semesters successfully and is opting out from further education will be conferred Advanced Diploma. The degree of B.Voc shall be conferred on the candidate who pursues the prescribed course of study for six semesters. The B. Voc degree is equivalent to BA/B.Sc degree for higher studies and employment.

Objectives of the Course

Many factors like, available infrastructure, capital and power, availability of resources, transport network, climate favoring to the high potential of industrial growth in Kokan region. The consistent growth of several Pharmaceutical, Chemical, Agrochemical, Food and Petrochemical industries has created several job avenues to the skilled graduates. The major hurdles for these industries are lack of adequately skilled and Good Laboratory Practice (GLP) oriented workforces.
This course is designed to fulfill the skilled workforce requirement of Research & Development and testing laboratories in various industries.
The course covers following objectives:-

- To propagate the ideas, practices and policies that constitutes the concept of sustainable agriculture.
- To provide the skill of different processes for Sustainable Agriculture
- To impart knowledge and proficiency in Organic farming, Certification process and marketing of organically raised agricultural produces
- To empower the students with an economically viable, socially supportive and ecologically sound education for agricultural sustainability.
- To provide education that emphasizes topography, soil characteristics, climate, pests, local availability of inputs and the individual grower's goals.
- Develop communication and soft skills between farmers and suppliers.
- Promote self-employment and income generation.
- Develop awareness about environment, soil and resources conservation for sustainable development.

Course Outcomes

- To enable the students to acquire knowledge on importance of agriculture and various processes of farming.

- To study the fundamentals of agronomy and classification of field crops.
- To study fundamentals of horticulture, gardening
- To learn preparation of various organic manures and using it for sustainable agriculture
- To study various processes of integrated farming practices

PROGRAMME STRUCTURE

The BVoc Programme shall include General Education components and Skill Components.

The credit distribution for the programme is shown below.

Normal Calendar Duration	**Skill Component Credits**	**General Education Credits**	**Total Credits**
One semester	18	12	**30**
Two Semesters	36	24	**60**
Four Semesters	72	48	**120**
Six Semesters	108	72	**180**

Year/Semester	NSQF Certification Level	Vocational Qualification	Title of Programme
First Year (Sem. I)	4	Certificate Course (Duration 6 Months)	Certificate course in Sustainable Agriculture
First Year (Sem. II)	5	Diploma (Duration 1 Year)	Diploma in Sustainable Agriculture
Second Year (Sem. III and IV)	6	Advanced Diploma (Duration two years)	Advanced Diploma in Sustainable Agriculture
Third Year	7	B. Voc. (Sustainable Agriculture)	B. Voc. in Sustainable Agriculture

(Course Code details: SA-Sustainable Agriculture,
G-General Education,
S- Skill Component
1- DrFirst Semester,
1S-First Skill Paper,
2S- Second Skill Paper,
1G- First General Paper
2G- Second General Paper

I- Internship/training/Project/Dissertation.

BACHELOR OF VOCATION

Sustainable Agriculture (to be implemented from 2020-21)

Semester-I

Code	Paper	Credits	Lectures	L/Wk
General Component				
BUSAT11	Organic Farming: Concept, Components, Processes, Certification	3	45	3
BUSAT12	Organic Farming: Nutrient Management	3	45	3
BUSAT13	Basic Principles of Food Processing	3	45	3
BUSAT14	Computer Fundamentals for Office Automation	3	45	3
Skill Component				
BUSAP11	Organic Farming: Concept, Components, Processes, Certification (Practical)	4	120	8
BUSAP12	Organic Farming: Nutrient Management (Practical)	4	120	8
BUSAP13	Basic Principles of Food Processing (Practical)	4	120	8
BUSAP14	Computer Fundamentals for Office Automation (Practical)	4	120	8
BUSAP15	NCC/Yoga/ Fine arts/Basics of Mathematics I	2	60	4

B. Voc. Sustainable Agriculture
SEMESTER I General Component

Paper I : Organic Farming: Concept, Components, Processes, Certification
Code: BUSAT 11 Credits: 3 Lectures: 45

Objectives

- To acquaint with Components, Processes of Organic Farming, Organic Certification process

Module 1

Importance of agriculture in India, Definition of Organic Farming, It's importance in today's era, History, Ancient agriculture, Green revolution, Hazardous effects of chemical fertilizers, Concept of Organic Farming, Principles of Organic Farming, Objectives of Organic Farming (as per IFOAM), Characteristics of Good Organic Farmer, Conventional vs Organic Farming, Advantages and Disadvantages of Organic Farming

Module 2

Various Organic Farming Models-Natural Farming, Fukuoka-Japan, Parma Culture etc., Organic Farming: Global scenario and Opportunities, Organic farming in India: Current Status and Challenges, Govt. Schemes promoting Organic farming, Export of Organic Food from India

Module 3

Components of Organic Farming, Pest and Disease Management in Organic Farming: Strategies- Avoidance Techniques, Managing the Growth Environment, Direct Treatment, Various Herbal pesticides, Plants used, Procedure, benefits, Weed Management in Organic Farming, Organic Crop Management, Biodiversity Conservation in Organic Farming, Crop planning and rotation design in organic system, Organic Farming and Climate Change, Relation of Soil, Organic Food and Human and Environmental Health

Module 4

India Organic certification, NSOP and APEDA, Principle of Standards, Products for Use in Fertilizing and Soil Conditioning, Products for Plant Pest and Disease Control, Process of Organic certification, Certification Agencies, Field Inspection

Paper II Organic Farming: Nutrient Management
Code: BUSAT 12 **Credits: 3** **Lectures: 45**

Objectives

- To acquaint with Nutrient Management of Organic Farming

Module 1

Components of Nutrient Management in Organic Farming, Pedological and Edaphological concept and components of soil. Soil ecology, Soil microbiology, Improvement in soil profile, Properties of soil (Physical, Chemical, Biological) and their significance. Soil air, Soil water, Water Holding Capacity, Soil colloids

Module 2

Soil Testing, Collection of soil sample for soil testing, Parameters, Instruments for soil testing and sample collection, Application, Water Testing, Parameters, Instruments, Problems of soils, Saline and Alkali Soils, Biological Reclamation, Management of Saline soils, Macronutrients for plants, Micronutrients for plants, Various Soil amendments, Sources, Effects, Nutrients

Farm Yard Manure (FYM): Process, Nutrients, Factors affecting nutrient quality of FYM, Uses, Green Manuring: Plants suitable as Green Manures, Nutrient Contents, Characteristics of Good Green Manure, Uses, Benefits

Module 3

Composting: Process, Essential requirements, Secret to healthy compost, Four phases of composting, Microorganisms in composting, Don’ts in composting

Types of Composting: Bangalore Method, Indore Method, Coimbatore Method, NADEP Method of Composting

Vermicompost Technology: Material for vermicomposting, Earthworm Species, Methods Process of vermicomposting, Precautions, Nutritional Value, Uses of vermicompost

Vermiwash: Process for Preparation of Vermiwash, Nutrients, Uses

Module 4

Liquid Organic Fertilizers: Micoorganisms in Liquid Organic Fertilizers, Nutrient content

Jivamrit: Ingredients, Procedure, Applications, Benefits

Beejamrita: Ingredients, Procedure, Application, Effects, Benefits

Panchgavya: Ingredients, Procedure, Chemical composition, Applications, Benefits

Reference Books for paper I and II:

1. Ananthakrishnan, T.N. (ed.) 1992. Emerging Trends in Biological Control of Phytophagous insects.Oxford & IBH, New Delhi.
2. Chhonkar, P.K. and Dwivedi, B.S. 2004. Organic farming and its implications on India's food security.Fertil. News 49(11): 15-18,21-28,31&38.
3. Gaur, A.C. 1982. A Manual of Rural Composting. FAO/UNDP Regional Project Document, FAO, Rome.
4. Howard, A. 1940. An Agricultural Testament. Oxford University, London. Lampin, N. 1990. Organic Farming. Farming Press Books, Ipswitch, U.K.
5. Palaniappan, S.P and Anandurai, K. 1999. Organic Farming- Theory and Practice, Scientific Pub., Jodhpur.
6. Reddy, M.V. (ed.) 1995.Soil organism and Litter decomposition in the Tropics. Oxford &IBH, New Delhi.
7. Singh, S.P. (ed.) 1994. Technology for Production of Natural Enemies, Project Directorate of Biological Control, Bangalore.
8. Trewavas, A. 2004. A critical assessment of organic farming and food assertions with
9. Trivedi, R.N. 1993. A Text Book of Environmental Sciences, Anmol Pub., New Delhi.
10. Veeresh, G.K., Shivashankar, K. and Singlachar, M.A. 1997. Organic Farming and Sustainable Agriculture, Association for Promotion of Organic Farming, Bangalore.
11. Woomer, PL. and Swift, M.J. 1994. The Biological Management of Tropical Soil Fertility,.S.B.F. & Wiley.
12. Organic Farming for Sustainable Agriculture by Dahama A. K. Agrobios Publication.
13. Organic Farming in India, Problems and Prospects by Thapa, U. and Tripathi, P.
14. Trends in Organic Farming in India by Agrobios Publication
15. Recent Developments in Organic farming by Gulati and Barik

Paper III Basic Principles of Food Processing
Code: BUSAT 13 Credits: 3 Lectures: 45

Objectives

- To provide a basic sequence of steps to produce an acceptable and quality food product from raw materials.
- Study of scientific and technological advancements in food processing.

Module 1- Classification of Food, Fundamentals of Food Processing
Definition of food, Classification of foods- based on origin, pH, nutritive value, Organic 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, Chemical, enzymatic, physical and biological deterioration, implications and prevention.

Module 2- Post Harvest Management, Processing of Ethnic Foods, Tomato and Pineapple
Banana products- banana puree, banana chips
Jamun (black plum/jambhul)- pulp extract, dried products
Potato wafers, Corn flakes, Pop corn.
Processing of Tomato: Tomato juice, canned whole tomatoes, tomato ketchup, tomato jams, tomato puree, tomato powder.
Pineapple products- juice, jam, jelly, canning,

Module 3- Processing of Mango
Mango and mango products- raw unripe mango products: brined mango slices, dried green mango slices and powder (Amchur), canned mango slices in syrup, canned or frozen mango pulp, mango juice or mango nectar, mango jam, mango squash, mango juice powder, mango freeze dried products, mango syrup.

Module 4-Processing of Vegetables
Processing of okra (ladies finger), potatoes, onions, carrots, green peas, wild vegetables, drying techniques vegetables of procuring, transportation, storage, processing, packaging and ware housing.

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, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
5. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000.
6. Srilakshmi, B. Food Science (3rd edition), New Age International (P) Limited Publishers, New Delhi, 2003.
7.Siddappa and Bhatia, Fruits and Vegetable Processing Technology
8. Lea, R. A. W, Fruit juice processing and packaging
9. Hui, Y. H. Processing of fruits
10. Cash J. N. Processing of vegetables
11. Jongen, W. Fruit and vegetable processing

Paper IV Computer Fundamentals for Office Automation
Code: BUSAT 14 Credits: 3 Lectures: 45

Objectives

- To provide basic knowledge of Office Automation Tools of Computer.

Module 1- Introduction to MS Word

Introduction to word, the word window, Create a new document, Save, open and print document, Editing document, Formatting a Document, Insert elements to word document, Changing Layout of document, Working with Tables, Spelling and grammar check, Auto correct.

Module 2- Spread Sheet Using MS Excel

Sheet Introduction, editing and formatting of cells and rows, Print Preview and Page Layout, Formula bar, Cell Referencing - Relative, Absolute, Mixed Useful functions from Function Library, What if Analysis, Calculative Examples like salary sheet, mark sheet etc., Conditional formatting, Data sorting and Filter, Types of different chart and editing charts.

Module 3- Presentation Using MS Power Point

Introduction to Power point, Inserting new slide, Different layout of slide, Inserting date, slide number, movie, sound, object, header and footer, Designing slide, Theme and background, Custom animation, Slide transition, Rehearse timings, Slide show, Setup slide show, Hide slide, Different views of slide, Use of slide master, Printing hand out, slide.

Module 4- Internet

Introduction to Internet, Use of Internet, Applications of Internet, World wide web (web page, web site, web client and web server), Web browsers, Search engines, Email, Blogs and forums, Social media and chatting, Bookmarks, Internet Search, Basic search, Tips and Tricks for search, How to download and upload?

Reference Books

1. Windows-98 6 in 1 Practice Hall Publications.
2. ABC of Word 97 by BPB Publication.
3. ABC of Excel by BPB Publication.
3. Computer Fundamentals P.K. Sinha by BPB Publication.
4. Internet-An Introduction, TATA McGraw Hill Publication.

B. Voc. Sustainable Agriculture
SEMESTER I Skill Component

Paper I Organic Farming: Concept, Components, Processes, Certification (Practical)
Code: BUSAP 11 Credits: 4 Hours: 120

Objectives

- To study of Concept, Components, Processes of Organic Farming

Practicals

- Visit to an organic farm to study various components and utilization
- Survey on problems and opportunities in Organic Farming
- Study on various Govt. Schemes promoting Organic farming
- Study Pest and Disease Management in Organic Farming
- Study Weed Management in Organic Farming
- Visit to study Integrated Farming System
- Study on Organic Crop Management
- Study on Livestock Management in Organic Farming
- Study on Biodiversity in Organic Farming
- Study of Crop planning and rotation design in organic system
- Plant protection through bio-agents and traps.
- Plant protection using pheromones.

Paper II Organic Farming: Nutrient Management (Practical)
Code: BUSAP 12 Credits: 4 Hours: 120

Objectives

- To study of skills of various processes of nutrient management of Organic Farming

Practicals

- Study of microbiology of soil
- Study of Soil profile
- Estimation of Water Holding Capacity of soil
- Measures for Reclamation of Saline and Alkali Soils
- Collection of soil sample for soil testing
- Analysis of soil by using soil testing kit
- Analysis of water/ Water Testing
- Preparation of enriched farm yard manure.
- Preparation of compost by NADEP Method
- Preparation of compost by Bangalore Method
- Preparation of Vermicompost
- Raising green manure crops and cover crops
- Preparation of Vermiwash
- Preparation of Panchgavya
- Preparation of Jivamrita
- Preparation of Beejamrita
- Apply for Organic Certification
- Visit to study Packaging and Marketing of Organic Products

Paper III Basic Principles of Food Processing
Code: BUSAP 13 Credits: 4 Hours: 120

Objectives

- To study the manufacture of various food products
- To familiarize the students with processing of fruits and vegetables

Practicals

- Preparation of potato chips
- Preparation of pulp extract of Jamun
- Dried products of Jamun
- Preparation of banana chips
- Preparation of banana puree
- Processing of pineapple jam
- Processing of pineapple jelly
- Pineapple juice canning
- Manufacture of tomato puree
- Manufacture of tomato sauce
- Manufacture of tomato ketchup
- Processing of mango squash
- Preparation of mango jam
- Preparation of dried green mango slices and powder
- Drying of vegetables
- Grading and Packaging of fruit and vegetable products

Paper IV Computer Fundamentals for Office Automation (Practical)
Code: BUSAP 14 Credits: 4 Hours: 120

Objectives

- To give skill to use Microsoft Office

Practicals

- Create a new document, save, open and print document in MS Word.
- Editing and formatting of a word document.
- Insert elements to a word document *viz*. Insert and delete page break, Insert page numbers, Insert symbols, Insert Shapes, Clip art, Insert picture, resize and reposition a picture),
- Change Layout of a word document *viz*. adjust page margin and page size, Change page orientation, Set and change indention, Insert and clear tabs.
- Inserting and formatting of a table in a word document *viz*. Insert a table, Navigate and select text in a table, Resize parts of a table, Align text in a table, Format a table, Insert and delete columns and rows, Borders and shading, Merge table cells),
- Use of Spelling and grammar check and auto correct options in MS word.
- Create a spread sheet and format rows and columns viz. selecting row, column, cell, Inserting and deleting row, column and cell, hide and unhide row & column, changing height and width of row and column.
- Use of formula bar for various applications
- Calculative Examples of spread sheet like salary sheet, mark sheet, sorting and filtering of data.
- Create different types of charts and editing of charts in spread sheet.
- Create a new Power point presentation - Inserting new slide, different layout of slide, inserting date, slide number, movie, sound, object, header and footer,
- Designing of slides in power point - Theme and background, Custom animation, Slide transition, Rehearse timings,
- Use of Slide show, setup slide show, hide slide, different views of slide, use of slide master, printing hand out in power point.
- Use of Internet – different web browsers, search engines.
- Use of Email, Blogs and forums, Social media and chatting.
- Bookmarking, Internet Search, Basic and advanced search.
- Downloading and uploading of the documents.

Paper V NCC/Yoga/ Fine arts/Basics of Mathematics I
Code: BUSAP 15 Credits: 2 Hours: 60