

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 Third 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	2022-23

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Syllabus for T.Y. B.Voc.

Program: B. Voc. Sustainable Agriculture

Course: T.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- First 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 2022-23)

Semester-V

Code	Paper	Credits	Lectures	L/Wk
General Component				
BUSAT 51	Livestock Farming	3	45	3
BUSAT 52	Agricultural Metereology	3	45	3
BUSAT 53	Protected cultivation of Horticultural crops	3	45	3
BUSAT 54	Fundamentals of Agricultural Extension Education	3	45	3
Skill Component				
BUSAP 51	Livestock Farming (Practical)	4	120	8
BUSAP 52	Agricultural Metereology (Practical)	4	120	8
BUSAP 53	Protected cultivation of Horticultural crops(Practical)	4	120	8
BUSAP 54	Fundamentals of Agricultural Extension Education(Practical)	4	120	8
BUSAP 55	Project (Nursery Management)	2	60	4

**B. Voc. Sustainable Agriculture
SEMESTER V General Component**

Paper I: Livestock Farming

Code: BUSAT 51

Credits: 3

Lectures: 45

Objectives

- To familiarize with fundamentals of livestock farming.
- To acquaint with the management of various farms.

MODULE 1

Role of Livestock in National economy: Management- Principles of management, Functions of management, Tools of management. General Management Practices in Dairy farming- Grooming, Drying off, Control of bad habits, Castration, Dehorning, Trimming, Shoeing, Identification marks, removing extra teats.

MODULE 2

Cattle and Buffalo management- Housing of Cattle, Calf raising, Heifer management, Management of pregnant and lactating cow and Buffaloes, Care and management of cross breed cow, Care and management of breeding bull, Sheep and Goat management- Housing of sheep and goat, General management practices.

MODULE 3

Milk Industry: Dairy Development in India- Operation Flood Programme, Contribution of Military Dairy Farm, NDDB, NDRI, Milk grid to dairy development. Dairy Co-operatives structure and functions, Milk Chemistry and Milk constituents- Definition of Milk, Composition of Milk, Constituent of Milk, Factors affecting Quality and Quantity of milk, Nutritive value of milk, Physico-chemical properties of milk. Clean milk production: Source of contamination.

MODULE 4

Poultry management: - Housing of Poultry, General Management practices, Pig Farming, Rabbit Farming, Duck Farming- Breeds of duck, General management practices. Quail management.

Text books:

- 1) A Text Book of Animal Husbandry by G.C. Banarjee
- 2) A Text Book of Animal Science by. Dr. A.U. Bhikane and Dr. S.B. Kawitkar
- 3) Advances in Dairy Animal Production by V.D. Mudgal, K.K. Singhal and D.D. Sharma
- 4) Handbook of animal Husbandry, The I.C.A.R. publication
- 5) Animal Husbandry & Dairy Science by. Jagdish Prasad.
- 6) Dairy India Yearbook - 2007 by. P.R. Gupta
- 7) Hanbook of Veterinary Physician by V.A. Sapre
- 8) Farm Animal management and feeding practices in India by Thomas & Shashtri
- 9) Dairy Microbiology by K.C. Mahanta

Paper II: Agricultural Meteorology

Code: BUSAT 52

Credits: 3

Lectures: 45

Objectives:

- To study various meteorological aspects in relation with crop production

MODULE 1

Introduction to Meteorology and Agricultural Meteorology - Scope and importance of Agricultural Meteorology - Composition of Atmosphere - Role of greenhouse gases in global cooling and warming - Concept of weather and climate - Micro-meso-macro and phyto climates soil temperature and its variations.

MODULE 2

Meteorological and Agro meteorological Stations, Types of agrometeorological Stations . Crop weather diagrams and calendars Preparation of crop weather calendars, weather and climate related natural disasters, risk and management - Climate change and global warming - weather modification - Introduction to Remote Sensing

MODULE 3

Cloud classification and measurements - cloud seeding - Rainfall and its mechanisms - forms and types of rainfall - Indian monsoons - southwest monsoon - northeast monsoon - monsoon variability across India - Rainfall over India, Rainfall and its mechanisms - forms and types of rainfall - Indian monsoons - southwest monsoon - northeast monsoon - monsoon variability across India - Rainfall over India Role of weather on insect pest and diseases.

MODULE 4

Importance of weather forecasting in Agriculture - weather service to farmers - agricultural seasons - crop weather diagrams and calendars - crop weather relationships - Role of weather on insect pest and diseases.

Suggested Readings:

1. Das.P.K. 1968.The Monsoons. NBT, New Delhi.
2. Khadekar, S.R. 2001.Meteorology.Agromet publishers, Nagpur.
3. Mavi, H.S. 1986. Introduction of Agrometeorolgy. Oxford & IBH Publishing Co. New Delhi
4. Menon, P.A. and Rajan, C.K. 1989. Climate of Kerala. Classic publishing house, Kochi.
5. PrasadaRao, G.S.L.H.V. 2005. Agricultural Meteorology. Second Edition.KeralAgricultural University, Thrissur.
6. Sachati, A.K. 1985. Agricultural Meteorology - Instruction-cum-practical manual, NCERT, New Delhi
7. Varshneya, M.C. and BalakrishnaPillai, B. 2003.Textbook of Agricultural Meteorology.ICAR, New Delhi.
8. Venketaraman, S. and Krishnan, A. 1992.Crops and weather. ICAR, New Delhi.
9. Wilsie, P.C. 1961.Crop Adaptation and distribution. Eurasia Publishing House (P) ltd., New Delhi.

Paper III: Protected cultivation of Horticultural crops

Code: BUSAT 53

Credits: 3

Lectures: 45

Objectives

- To familiarize with protected cultivation structures and cultivation practices

MODULE 1

Introduction - scope and importance - problems and prospects of protected culture in India - growing structures - green house - polyhouse - net house - basic considerations in establishment and operation of greenhouses - maintenance .

MODULE 2

Advantages of growing plants in a greenhouse - functioning and maintenance. Manipulation of environmental factors - environmental control systems in green house. Maintenance of cooling and heating system in green houses.

MODULE 3

Type of containers used in protected culture. Substrate -Use of substrate and preparation of substrate for protected cultivation, soil decontamination. Water management - nutrient management (fertigation).

MODULE 4

Crop regulation - special horticultural practices in protected cultivation for commercially important crops: vegetable crops, flowering plants, seedlings, etc. Harvesting methods - postharvest handling - standards - grading - packing and marketing.

Suggested Readings:

1. Foja Singh., 1997. Advances in Floriculture. Media Today Pvt. Ltd., New Delhi-17.
2. Prasad, S. and U.Kumar. 1998. Commercial floriculture. Agro Botanica. Bikaner - 334
3. Roy. A. Larson., 1992. Introduction of Floriculture. International Book Distributing Co., Lucknow.
4. Vishnu Swarup., 1997. Ornamental Horticulture. Macmillan India Ltd., New Delhi-2. Wltez, S., 1972. The world gladiolus, NAGG, USA.
5. Yadav, L.P. and Bose, T.K., 1986. Biology, conservation and culture of orchids. East-West Press Private Limited, New Delhi.E.
6. Yadav.I.S. and M.L. Choudhary., 1997. Progressive floriculture. The House of Sarpan, (Media), Bangalore.

Paper IV: Fundamentals of agricultural extension education

Code: BUSAT 54

Credits: 3

Lectures: 45

Objectives

- To provide knowledge and help to farmers that will enable him to farm more efficiently and to increase his income.
- To promote better social, natural, recreational, intellectual and spiritual life among the people.

MODULE 1

Education: Meaning, definition & Types; Extension Education- meaning, definition, scope and process; objectives and principles of Extension Education; Extension Programme planning- Meaning, Process, Principles and Steps in Programme Development. various extension/ agriculture development programmes launched by ICAR/ Govt. of India (IADP, IAAP, HYVP, KVK, IVLP, ORP, ND,NATP, NAIP, etc.).

MODULE 2

New trends in agriculture extension: privatization extension, cyber extension/ e-extension, market-led extension, farmer-led extension, expert systems, etc. Rural Development: concept, meaning, definition; various rural development programmes launched by Govt. of India. Community Dev.-meaning, definition, concept & principles, Philosophy of C.D. Rural Leadership: concept and definition, types of leaders in rural context;

MODULE 3

Extension administration: meaning and concept, principles and functions. Monitoring and evaluation: concept and definition, monitoring and evaluation of extension programs; transfer of technology: concept and models, capacity building of extension personnel; extension teaching methods: meaning, classification, individual, group and mass contact methods, ICT Applications in TOT (New and Social Media), media mix strategies;

MODULE 4

Communication: meaning and definition; Principles and Functions of Communication, models and barriers to communication. Agriculture journalism; diffusion and adoption of innovation: concept and meaning, process and stages of adoption, adopter categories.

Suggested Readings:

- 1) Dahama, O.P. and Bhatnagar, O.P. 1980. Education and Communication for Development. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- 2) Dudhani, C.M.; Hirevenkatgoudar, L.V., Manjunath, L.; Hanchinal, S.N. and Patil, S.L. (2004). Extension Teaching Methods and Communication Technology, UAS, Dharwad.
- 3) Kamat, M.G. (1985). Writing for Farm Families. Allied Publishers, New Delhi.
- 4) Kelsey, L.D. and Hearne, G.C. (1963). Cooperative Extension Work, Comstar Publishing Associate, New York.
- 5) Mehta, D.S. (1981). Mass Communication and Journalism in India. Vikas Publication, New Delhi.
- 6) Ray, G.L. (1991). Extension Communication and Management. Noya Prakash, Calcutta.
- 7) Reddy, A.A. 2005 Extension Education. Sri Lakshmi Press, Bapatla.
- 8) Rogers, E.M. 2003. Diffusion of Innovations. Free Press, New Delhi.
- 9) Samanta, R.K. (1990). Development Communication for Agriculture. BR Publishing Corporation, Delhi.
- 10) Sandhu, A.S. (1993). Textbook on Agricultural Communication : Process and Methods. Oxford and IBH Publishing Pvt.Ltd., New Delhi.
- 11) Singh, A.K., Lakhan Singh, R. and Roy Burman (2006). Dimensions of Agricultural Extension. Aman Publishing House, Meerut

B. Voc. Sustainable Agriculture
SEMESTER V (Skill Component)

Paper I: Livestock Farming

Code: BUSAP 51

Credits: 4

Lectures: 120

Objectives

- To familiarize with practices in livestock farming.
- To acquaint with the management of important farm animals and birds

Practical:

1. Morphology of cattle, buffalo and poultry
2. Classification of Cattle Breeds
3. Study of Cattle, Breeds
 - a. Milch : Gir, Sahiwal, Red Sindhi,
 - b. Draught: Khillar, Dangi, Red kandhari.
 - c. Dual: Deoni, Hariyana
 - d. Exotic: Jearsy, H.F.
 - e. Cross breed: Holdeo, Jerdeo.
4. Study of Buffalo Breeds: Murrah, Jaffrabadi, Nagpuri and Surti
5. Study of Sheep and Goat breeds: Osmanabadi, Jamnapuri, Saanem
7. Identification marks of farm animals
8. Handling and casting of farm animals
9. Study of milking dairy animals
10. Determination of age of animal
11. Determination of body weight of animal
12. Recording temperature, pulse and respiration rate of farm animals
13. Preparation of antiseptic ointment
14. Preparation of vaccination schedule
15. Study of dairy farm records
16. Visit to veterinary hospital
17. Visit to Dairy farm/ Poultry farm/Goat farm

Paper II: Agricultural Meteorology

Code: BUSAP 52

Credits: 4

Lectures: 120

Objectives:

- To study the practical meteorological aspects in relation with crop production.

Practical :

1. Selection of site and layout of agro meteorological stations and meteorological instruments.
2. Installation of soil thermometers and measurement and recording of soil temperature.
3. Measurement of Relative humidity and vapour pressure and Measurement of Air temperature.
4. Dew point temperature and dew fall.
5. Measurement of rainfall and measurement of wind speed and direction.
6. Measurement of open pan evaporation.
7. Sunshine Recorder and measurement of sunshine.
8. Recording of weather data - tabulation- Processing and presentation Meteorological data.
9. Preparation of crop weather calendars.

Paper III: Protected cultivation of Horticultural crops

Code: BUSAP 53

Credits: 4

Lectures: 120

Objectives:

- To practice with protected cultivation practices of important crops

Practical Schedule

1. Study of structures utilized for protected culture.
2. Cost estimation of different growing structures
3. Design and orientation of poly/green houses.
4. Study of various inputs used for protected culture
5. Type of containers used in protected culture.
6. Use of substrate and preparation of substrate for protected cultivation
7. Fertigation system in green houses
8. Maintenance of cooling and heating system in green houses.
9. Special horticultural practices in protected cultivation
10. Protected cultivation of different vegetables like capsicum, tomato
11. Protected cultivation of flowers like orchids and anthurium.

Paper IV: Fundamentals of agricultural extension education

Code: BUSAP 54

Credits: 4

Lectures: 120

Objectives

- To acquaint with extension education system.

Practicals :

1. To get acquainted with university extension system.
2. Group discussion- exercise; handling and use of audio visual equipments and digital camera and LCD projector; preparation and use of AV aids, preparation of extension literature – leaflet, booklet, folder, pamphlet news stories and success stories;
3. Presentation skills exercise; micro teaching exercise;
4. A visit to village to understand the problems being encountered by the villagers/ farmers; to study organization and functioning of DRDA and other development departments at district level;
5. Visit to NGO and learning from their experience in rural development; understanding PRA techniques and their application in village development planning; exposure to mass media:
6. visit to community radio and television studio for understanding the process of programme production; script writing, writing for print and electronic media, developing script for radio and television

Paper V: Project (Nursery Management)

Code: BUSAT 55

Credits: 2

Lectures: 60

Project for Skill Development

- Nursery raising of Horticultural crops
- Use of Different plant propagation methods for nursery raising
- Maintenance of Nursery
- Preparation of practical record.