SHIVAJI UNIVERSITY, KOLHAPUR

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Accredited by NAAC with 'A' grade
with CGPA 3.16

CREDIT BASED SYSTEM

Faculty of Inter-Disciplinary Studies

Structure, Scheme and Syllabus
for

Bachelor of Vocation
in
Sustainable Agriculture

B.Voc. (Sust. Agri.)

(Subject to the modifications that will be made from time to time)
Syllabus to be implemented from June 2019 onwards.

SHIVAJI UNIVERSITY, KOLHAPUR

Structure, Scheme and Syllabus of B.Voc. (Sust. Agri.)

TITLE OF PROGRAMME : B. Voc.(Sustainable Agriculture) Part-II (Advanced Diploma)
Under Faculty of Inter-Disciplinary Studies (IDS)

YEAR OF IMPLEMENTATION : Syllabus will be implemented from August, 2019

DURATION : B. Voc. Part II (One Year)

NATURE OF AWARD : Awards are to be given at each stage as per the cumulative credits awarded to the learners as shown in the following table :

Course/Awards	Normal Duration	General Education Credit	Skill Component Credit	Total Credit for Award	NSQF Level
Certificate	One Semester	12	18	30	4
Diploma	Two Semester	24	36	60	5
Advanced Diploma	Four Semester	48	72	120	6
B.Voc. Degree	Six Semester	72	108	180	7

PATTERN OF EXAMINATION : Semester Pattern

- **Theory Examination :** At the end of semester as per Shivaji University Rules
- **Practical Examination :**
  i) In the 1st,3rdand 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 One Project / Industry Visit/ Study Tour / Survey

SCHEME OF EXAMINATION

A.THEORY

- The theory examination shall be at the end of the each semester.
- All the general theory papers shall carry 40 marks and all vocational theory papers shall carry 50 marks.
- 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 Core Theory examination. (50 Marks)**
  i. There will be seven questions carrying equal marks.
  ii. Students will have to solve any five questions.

Q. No. 1 : Multiple choice selection, True or False, Match with Appropriate (10 Marks)
Q. No. 2 to Q. No. 6 : Long answer type questions Attempt any Three (30 Marks)
Q. No. 7 : Short Notes, Two out of Three (10 Marks)

- **Nature of question paper for General Theory examination (40 Marks)**
  i. There will be seven questions carrying equal marks.
  ii. Students will have to solve any five questions.

Q. No. 1 : Multiple choice selection, True or False, Match with Appropriate (8 Marks)
Q. No. 2 to Q. No. 6 : Long answer type questions Attempt any Three (24 Marks)
Q. No. 7 : Short Notes, Two out of Three (8 Marks)

B . PRACTICAL: (For 3 Core subject Practical 50 Marks and For 2 General subject Practical 10 Marks)

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.

C. STANDARD OF PASSING:

The standard of passing with minimum grade points will be as per the guidelines and rules of UGC – NSQF. The details are as follows

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

A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

B. Voc – Part II, Semester –III

Sr No	Paper No	Title	Marks (Total)	Distribution ofMarks		Credits	
				Theory	Practical	Theory	Practical
I. General Education Components							
1	XIX	Fundamental of financial accounting-I	50	40	10	3	2
2	XX	Cereals and Pulses processing technology	50	40	10	3	2
II. Skill Education Components							
3	XXI	Fundamentals of Plant Pathology and crop disease management	50	50	--	3	--
4	XXII	Protected cultivation of Horticultural crops	50	50	--	3	--
5	XXIII	Integrated pest management in crops	50	50	--	3	--
6	XXIV	Lab Work Fundamentals of Plant Pathology and crop disease management	50	--	50	--	3
7	XXV	Lab Work Protected cultivation of Horticultural crops	50	--	50	--	3
8	XXVI	Lab Work Integrated pest management in crops	50	--	50	--	3
9	XXVII	Project Work/Study Tour	50	--	50	--	2

B. Voc – Part II, Semester –IV (Advanced Diploma)

Sr No	Paper No	Title	Marks (Total)	Distribution ofMarks		Credits	
				Theory	Practical	Theory	Practical
I. General Education Components							
1	XXVIII	Fundamentals of Financial accounting II	50	40	10	3	2
2	XXIX	Farm Power and Machinery	50	40	10	3	2
II. Skill Education Components							
3	XXX	Weed management and fodder Crop production	50	50	--	3	--
4	XXXI	Livestock Farming	50	50	--	3	--
5	XXXII	Commercial crop and vegetable production	50	50	--	3	--
6	XXXIII	Lab Work Weed management and fodder Crop production	50	--	50	--	3
7	XXXIV	Lab Work Livestock Farming	50	--	50	--	3
8	XXXV	Lab Work Commercial crop and vegetable production	50	--	50	--	3
9	XXXVI	Project Work/Study Tour	50	--	50	--	2

Scheme of Teaching

B. Voc. – Part II,Semester – III (Advanced Diploma)

Sr No	Paper No.	Title	Distribution of Workload (Per Week)		
			Theory	Practical	Total
I. General Education Components					
1	XIX	Fundamentals of financial accounting-I	4	2	6
2	XX	Cereals and Pulses processing technology	4	2	6
II. Skill Education Components					
3	XXI	Fundamentals of Plant Pathology and crop disease management	4	--	4
4	XXII	Protected cultivation of Horticultural crops	4	--	4
5	XXIII	Integrated pest management in crops	4	--	4
6	XXIV	Fundamentals of Plant Pathology and crop disease management	--	4	4
7	XXV	Protected cultivation of Horticultural crops	--	4	4
8	XXVI	Integrated pest management in crops	--	4	4
9	XXVII	Project Work/Study Tour	--	--	--
		Total	20	16	36

B. Voc. – Part II,Semester – IV (Advanced Diploma)

Sr No	Paper No.	Title	Distribution of Workload (Per Week)		
			Theory	Practical	Total
I. General Education Components					
1	XXVIII	Fundamentals of financial accounting-II	4	2	6
2	XXIX	Farm Power and Machinery	4	2	6
II. Skill Education Components					
3	XXX	Weed management and fodder Crop production	4	--	4
4	XXXI	Livestock Farming	4	--	4
5	XXXII	Commercial crop and vegetable production	4	--	4
6	XXXIII	Weed management and fodder Crop production	--	4	4
7	XXXIV	Livestock Farming	--	4	4
8	XXXV	Commercial crop and vegetable production	--	4	4
9	XXXVI	Project Work/Study Tour	--	--	--
		Total	20	16	36

Environmental Science is compulsory for second year as per Shivaji University Guidelines.

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) /Ph.D.
2. M.A (English) with NET/SET for Business Communication
3. M.A./ M.Sc. (Environmental Science)

Eligibility for Laboratory Assistant: Any Graduate / Diploma .

Teaching Staff **:** As per UGC B.VOC guidelines

SHIVAJI UNIVERSITY, KOLAPUR
B. Voc. Part – II

Sustainable Agriculture

Semester III Paper No. XIX

FUNDAMENTALS OF FINANCIAL ACCOUNTING-I

Work Load - 6 | Total Marks – 50
Theory – 4 Lectures / Week | Theory- 40

Practical- 2 Lectures / Week | Practical- 10

Objective : To impart basic accounting knowledge as applicable to business.

Course contents:

Unit I : Introduction to Accounting

Meaning, Nature and Advantages of Accounting, Branches of Accounting, Accounting Concepts and Conventions, Types of Accounts, Rules of journalizing, Source Documents – Cash Voucher, Petty Cash Voucher, Cash Memo – Receipts, Debit Notes, Credit Note, Paying Slips, Withdrawals, Cheque

Unit II : Journal and Ledger

Preparation of Journal entries and Ledger accounts – Subsidiary Books - Purchase Book, Purchase Return Book, Sales Book, Sales Return Book, Cash Book, Bills Receivable Book, Bills Payable Book, Journal Proper

Unit III : Depreciation

Meaning, Methods – Straight Line Method – Reducing Balance Method, Change in Depreciation Method.

Unit IV: Final Accounts

Preparation of Trial Balance, Preparation of Final Accounts of Sole Traders and partnership firms

Practical:

1) Preparation of Journal entries and Ledger accounts

2) Preparation of subsidiary books

3) Preparation of Trial Balance

4) Practical problems on Final Accounts of sole traders and partnership firms

5) Practical problems on methods of depreciation

Scheme of Internal Practical Evaluation **10 Marks**

1) Submission of Record Book 5 Marks

2) Viva – Voce 5 Marks

References:

1) Advanced Accountancy – M.C. Shukla and T.S. Garewal.

2) Advanced Accountancy – S.C. Jain and K. L. Narang

3) Advanced Accountancy – S.M. Shukla.

4) Advanced Accountancy – S. N. Maheshwari.

5) Advanced Accountancy – R. L. Gupta.

Shivaji University, Kolhapur
B. Voc. Part – II (Sust. Agri.) Semester III
Paper – XX
Cereals and Pulses Processing Technology - Theory

Objectives

- To give a general outline about the principles, structure and composition, economic importance, storage and processing of different cereals, pulses and their products.

UNIT 1- Rice

Cereal grain structure, composition of rice, Processing- Milling, parboiling– Avorio process, conversion process, Malek process and Fernandez process and its advantages, by-products of cereals– starch, gluten, dextrose, dextrin, bran, broken grains, parched rice, puffed rice, flaked rice, popped rice, hulls, rice pollards, bran oil, germ and germ oil, husk, straw.

UNIT 2- Wheat

Classification of wheat, structure and composition, Harvesting and storage: wheat milling, wheat products: whole wheat flour, maida, semolina, macaroni products and its method of preparation: macaroni, spaghetti and vermicelli.

UNIT 3- Millets

Corn- types of corn, structure and composition, nutritive value, processing of corn: dry milling, wet milling and alkali processing, products of corn: degerminated flour, corn germ oil, pop corn, corn starch. Jowar, Ragi, Bajra and Rye: Nutritive value and processing.

UNIT 4- Breakfast cereals & Pulses

Definition, Nutritive value of breakfast cereals and classification of breakfast cereals: uncooked breakfast cereals and ready to eat cereals: processing of ready –to-eat cereals(Batch cooking, continuous cooking and extrusion cookers) and products (flaked cereals, puffed cereals, shredded products, granular products).

Pulses - Introduction, composition, processing, utilization of pulses, toxic constituents of pulses, important pulses- Bengal gram, red gram, black gram, green grm, moth bean, lentil, horse gram, field bean, pea, khesari dhal, cluster bean, cow pea, kidney bean, soyabean- processing, fermented products of soyabean.

References:

1. David Dendy A.V, etal; *Cereals* and *Cereal* Products: Technology and *Chemistry*, - 2000
2. Manay, N.S, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
3. Potter, N.N. and Hotchkiss J. H. Food Science. CBS publishers and distributors. 1996.
4. Srilakshmi, B. Food Science. New Age International Publishers, New Delhi, 2003.
5. Subalakshmi, G and Udipi, S.A. Food processing and preservation. New Age International Publishers, New Delhi, 2001.

Cereals and Pulses Processing Technology- Practical

Objectives:

- To give a general outline of the processing of different cereals, pulses and their products.

1. Manufacture of bread
2. Manufacture of cake
3. Manufacture of biscuit

References:

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 (3^{rd} edition), New Age International (P) Limited Publishers, New Delhi, 2003.

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B. Voc. Part – II (Sust. Agri.) Semester III

Paper-XXI

Fundamental of Plant Pathology and Disease Management

Objectives

- To understand the general characters of major plant pathogens.
- To acquaint with principles of crop disease management.

UNIT 1 - Introductory plant pathology

Concept of plant disease- Definition- classification of plant diseases-types of diseases based on symptom. Plant Pathology - introduction - definitions of terminology - bacteria, fungi, viruses, viroids, phytoplasmas, fastidious vascular bacteria, parasites, pathogens, biotrophshemi biotrophs, necrotrophs. Pathogenicity, pathogenesis, virulence, infection, inoculum, invasion, colonisation, inoculum potential, symptoms, incubation period. Survival and dispersal of plant pathogens. Phenomenon of infection and pathogenesis. Role of enzymes, toxins, growth regulators and polysaccharides. Disease cycle, disease syndrome, monocyclic diseases, polycyclic diseases, alternate host, collateral host. Predisposition, physiological race, biotype, symbiosis, mutualism antagonism. General characters of fungi, classification of fungi, methods of reproduction. General characters, taxonomy, somatic structures, reproduction, life cycle and pathological significance of major plant pathogenic fungus. General characters of bacteria- taxonomy, structure, reproduction and plant pathological significance - Characters and classification of phytopathogenic bacteria-symptoms of bacterial diseases, mode of entry and spread. General characters of Virus - definition- nature, properties, classification, and virus - vector relationships-common symptoms of virus, viroid and phytoplasmal diseases of crops. Characters of algal and phanerogamic plant parasites - symptoms.

UNIT 2 - Principles of crop disease management

Introduction - importance and history of crop disease management. Epidemiology of crop diseases - weather factors and their role - temperature, rainfall, relative humidity etc. Disease assessment -forecasting - disease modeling. Principles of crop disease management - Importance, general Principles - Avoidance - Exclusion – protection. Plant Quarantine and Inspection -Rules and Regulations.

UNIT 3 -Strategies of Plant Disease management

1. Cultural control-Roguing, eradication of alternate and collateral hosts, crop rotation, mixed cropping manure and fertilizer management. Sanitation, hot weather ploughing, soil amendments, time of sowing, seed rate and plant density, irrigation and drainage. Biological control - Role and mechanisms of biocontrol agents and PGPR. Physical Methods - soil solarisation, heat treatment etc. Chemical methods -Fungicides -classification - chemical groups of fungicides - inorganic, organic, systemic, antibiotic etc., Methods of application of fungicides - seed, soil, foliar spray, post harvest treatment, root feeding etc Fungicide formulations - Characteristics of an ideal fungicide. Compatibility and phytotoxicity of fungicides. Plant disease resistance - types of resistance - vertical and

horizontal - Defense mechanism in plants - Structural and Bio- chemical (pre and post-infection) cross-protection.

UNIT 4

Biotechnological approach in plant disease management - tissue culture - somaclonal variation, transgenic plants etc.

Integrated plant disease management (IDM) - Concepts, advantages and Importance.

References:

1. Agrios, G.N. 2003...*Plant Pathology* Academy Press. New York.
2. Mehrotra,R.S. 1980. *Plant Pathology* Tata Mc. Graw Till Publ.Co., New Delhi.
3. Nene,Y.L. and Thapliyal,P.N. 1998.*Fungicides in Plant Disease Control*. Oxford and IBH New Delhi
4. Prakasam,V. Reguchander,T. and Prabakar,K. 1998.*Plant diseases management*. A.E. Publication, Coimbatore.
5. Singh.R.S 2002.*Introduction to Principles of Plant Pathology*. Oxford and IBH Publishing, New Delhi.
6. Sharma, P. D. 2001. Plant Pathology, Rastogi publications, shivaji Road, Meerut.

Shivaji University, Kolhapur
B. Voc. Part – II (Sust. Agri.) Semester III

Paper – XXII
Protected Cultivation of Horticultural Crops

Objectives

- To familiarize with protected cultivation structures andcultivation practices

UNIT1

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 .

UNIT 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.

UNIT 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).

UNIT 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 - 334 004.
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.

B. Voc. Part – II (Sust. Agri.) Semester III

Paper – XXIII
Integrated Pest Management in crops

UNIT 1

IPM- introduction, importance, concepts, principles. Tools of IPM- Host plant resistance, definition, mechanisms of resistance, compatibility with other pest management practices - merits and demerits.

UNIT 2

IPM Methods- Cultural methods, Mechanical methods, Physical and Legislative methods, Biological methods- definition, methods, advantages, limitations. Natural enemies- parasites, predators and microorganisms used in pest control.

UNIT 3

Important groups of micro organisms-bacteria, viruses and fungi used in insect pest control. Mass multiplication techniques of important biocontrol agents.

UNIT 4

Chemical control - importance, hazards and limitations. Classification of insecticides based on chemical nature- insecticides of plant origin (botanical insecticides) and Synthetic insecticides. Preparation of neem oil garlic emulsion and tobacco decoction. Formulations of insecticides and calculation of quantity of formulations for field application. Synthetic insecticides -organophosphates, carbamates, synthetic pyrethroids. Plant protection equipments - Classification- and working principles- parts of sprayers, dusters and uses.

References:

1. Mani, M. S. 1968. General Entomology. Oxford and IBH Publishing Company, New Delhi.
2. Nayar, K. K., Ananthakrishnan T. N. and David.B.V. 1976. General and Applied Entomology, Tata McGraw Hill Publishing Company Limited, New Delhi.
3. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.
4. Richards, O.W. and Davies, R. G. 1977.Imm's General Text Book of Entomology, Vol.1&2, Chapman and Hall Publication, London..
5. Srivastava, P. D. and Singh, R. P. 1997.An Introduction to Entomology, Concept Publishing Company, New Delhi.
6. Dhaliwal, G. S. and Ramesh Arora. 1998. Principles of Insect Pest Management .Kalyani Publishers, New Delhi.

Shivaji University, Kolhapur
B. Voc. Part – II (Sust. Agri.) Semester III

Paper – XXIV
Fundamental of Plant Pathology and Crop Disease Management - Practical

Objectives

- To familiarize with the symptomatology of plant diseases.
- To develop skill in preparing and using plant protection chemicals and usage of plant protection equipments.

3 Hrs each for every practical

1. Common symptoms of plant diseases caused by fungi.
2. Symptomatology of viral diseases
3. Symptomatology of bacterial &phytoplasmal diseases.
4. Estimation of losses due to diseases
5. Method of scoring for diseases and Scoring for important fungal/Viral/bacterial diseases
6. Mass multiplication of important plant pathogens on cheap substrates and application on soil/plant –
7. Common laboratory techniques in mycology, preservation of plant disease specimens.
8. Microscopic slide culture, common media and mountants used in mycology.
9. Familiarization with different groups of fungicides.
10. Preparation of Bordeaux mixture, Bordeaux paste and cheshunt compound phytotoxicity of fungicides
11. Preparation of fungicidal spray solutions- methods of application of fungicides- spraying and soil drenching.
12. Seed treatment with systemic and contact fungicides.
13. Root feeding, post harvest treatment.
14. Solarisation for management of soil borne pathogens.
15. Demonstration of physical methods for crop disease management
16. Preparation and application of botanicals
17. Familiarization with plant protection equipments.
18. Field visits, survey and collection of disease samples

Paper – XXV
Protected Cultivation of Horticultural Crops - Practical

- 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

Protected cultivation aspects of individual crops:

10. Protected cultivation of cowpea,
11. Protected cultivation of capsicum
12. Protected cultivation of cucumber
13. Protected cultivation of tomato
14. Protected cultivation of orchids and anthurium.
15. Protected cultivation of rose.
16. Protected cultivation of chrysanthemum.

B. Voc. Part – II (Sust. Agri.) Semester III

Paper – XXVI
Integrated Pest Management in Crops - Practical

1. Familiarization with cultural methods of pest control.
2. Familiarization with Mechanical methods of pest control.
3. Identification of predators.
4. Identification of microbial agents.
5. Familiarization with different formulations of insecticides.
6. Preparation of neem oil garlic emulsion and tobacco decoction.
7. Familiarization with different insecticides.
8. Calculation of doses/concentrations of insecticides.
9. Preparation of spray fluid for field application.
10. Familiarization with Plant protection equipments.
11. Identification, symptoms of damage, collection and preservation of pests of:
    a) Rice, Coconut.
    b) Banana, Cashew.
    c) Pepper, cardamom.
    d) Brinjal, Bittergourd and cowpea.

B. Voc. Part –II (Sust. Agri.) Semester III

Paper –XXVII
Project

Students must submit detailed project report related to topics on sustainable cultivation aspects of cereal and pulses planning including land preparation, seed treatment, sowing, water management, identification of weeds and weed management, identification of insect pests and control, harvest and post harvest handling of products, storage and marketing of produce etc.

Note: In addition to regular practical, the students will complete certain time bound operations after the regular class hours,

Scheme of Practical Evaluation

Internal Practical Evaluation	50 marks
Q.1: Prepare project related topics	40 marks
Q.2: Viva-voce	10 marks

B. Voc. Part – II

Sustainable Agriculture

Semester IV Paper No. XXVIII

FUNDAMENTALS OF FIANACIAL ACCOUNTING- II

Work Load - 6 Lectures / Week — Total Marks – 50
Theory – 4 — Theory- 40

Practical- 2 Lectures / Week — Practical- 10

Objectives: To impact basic accounting knowledge as applicable to business.

Course contents:

Unit I Computerized Accounting System

Introduction – Concept – Components –Features - Importance and Utilization of Computerized Accounting System.

Unit II Computer Application through Accounting Package Tally

Creation of Company, Group, Ledger Accounts, Feeding of Accounting Data Receipts, Payments, Purchase, Sale, Contra, Journal, Credit Note and Debit Note

Inventory Information – Groups, Items and Valuation

Generation of various Accounting Reports

Unit III Accounts of Professionals

Preparation of Receipts and Payment Account – Income and Expenditure Account and Balance Sheets of Non Profit Organization.

Unit IV Single Entry System

Conversion of Single Entry System into Double Entry System.

Practical:

1. Understanding computerized accounting practices applied in different retail malls in and around Kolhapur city

2. Practical problems based on computerized accounting using Tally

3. Practical problems on preparation of Receipts and Payment Account

4. Preparation of Income and Expenditure account and Balance Sheet of Non-profit making organizations

- Solving the problems on conversion of Single Entry system into Double entry system. 6. Oral / Seminar

References:

1) Advanced Accountancy, M. C. Shukla and T. S. Garewal.

2) Advanced Accountancy, S.C. Jain and K. L. Narang.

3) Advanced Accountancy, S.N. Maheshwari.

4) Theory and practice of Computer Accounting, Rajan Chougule and Dhaval Chougule.

Web sites:

1) www.nos.org 2) www.wiki.answers.com 3) Chow.com

Scheme of External Practical Examination	**10 marks**
1) Submission of Record book	5 marks
2) Viva – Voce	5 marks

Paper – XXIX
Farm Power and Machinery

Objectives

- To acquaint with principles of farm machineries and their working.

UNIT 1

Status of farm power in India and Maharashtra- sources of farm power - merits and demerits of different forms of power.Farm mechanization-scope of farm mechanization-present status of mechanization-limiting factors and suggestions of farm mechanization.

UNIT 2

Thermodynamic cycle. Principle of working of internal combustion engines. Terminology connected with engine power. Fuel system, lubrication system and cooling system of IC engines.

UNIT 3

Farm tractor -classification-components and selection.Power transmission system of a tractor- clutch-governor-differential.Hydraulic control system of tractor.Tractor testing-performance characteristics of tractor engines. Power tiller-components of power tiller. Principles of operation of electric motor-types-components-care and maintenance.

UNIT 4

Tillage. Plough-classification-types-components-adjustments and repairs of mould board plough and disc plough. Plough accessories like coulter, jointer, scraper, land wheel and gauge wheels. Terminology connected with ploughs-advantages and disadvantages of different ploughs.

Ploughs like chisel plough, subsoiler and rotary plough etc. Harrows, Cultivators, Puddlers, Bund former, Ridger etc. Seed drill and seed cum fertilizer drill- components-types-calibration. Planter-functions-components. Plant protection equipments-sprayer-types-components-care and maintenance .Harvesters.

References:

1. Chakraverty, A. and D.S.De. 1981. *Post-harvest technology of cereals and pulses.* Oxford
2. Mohsenin, N.N. 1970. *Physical properties of plant and animal materials,* Gordon and Breach publishers, New York.
3. Pande, P.H.1994. *Principles of agricultural processing*, Kalyani Publishers, Ludhiana.
4. Sahay, K.M. and K.K. Singh. 1994. *Unit operations in agricultural Processing*, VikasPublishing House Pvt. Ltd., New Delhi.

Farm Power and Machinery - Practical

- To acquaint with principles of farm machineries and their working

1. Study of tools and equipments in a farm machinery workshop.
2. Study of different components of an IC engine.
3. Study of different components, operation and maintenance of power tiller.
4. Study of farm / homestead friendly equipment and implements.
5. Study of different components and operation of tractor.
6. Study of Mould Board plough and disc plough and its adjustments.
7. Study of seed-cum-fertilizer drills-furrow opener, metering mechanism, and calibration; adjustments.
8. Study of cultivators and harrows and its adjustment.
9. Study of different parts, registration, alignment and operation of mowers and its adjustments.
10. Study of paddy transplanter and harvester, registration and alignment.
11. Study of planters and different metering mechanisms.
12. Study of sprayers, repair and its calibration.

References:

1. Chakraverty, A. and D.S.De. 1981. *Post-harvest technology of cereals and pulses.* Oxford
2. Mohsenin, N.N. 1970. *Physical properties of plant and animal materials,* Gordon and Breach publishers, New York.
3. Pande, P.H.1994. *Principles of agricultural processing*, Kalyani Publishers, Ludhiana.
4. Sahay, K.M. and K.K. Singh. 1994. *Unit operations in agricultural Processing*, VikasPublishing House Pvt. Ltd., New Delhi.

Weed Management & Fodder Crop Production

Objectives

- To understand the general characters of weeds and their management
- To acquaint with cultivation of rice, fibre crops, fodder crops, etc.

UNIT 1

Weeds: Introduction, harmful and beneficial effects, classification, propagation and dissemination. Concepts of weed prevention, control and eradication; Methods of weed control: physical, cultural, chemical and biological methods. Integrated weed management (IWM); Herbicides: advantages and limitation of herbicide usage in India, Herbicide classification, formulations, methods of application.Compatibility of herbicides with other agro chemicals; Weed management in rice, banana, pineapple, coconut, rubber, vegetables.Aquatic and problematic weeds and their control.

UNIT 2

Origin, geographic distribution, economic importance, soil and climatic requirement , varieties, cultural practices , harvesting and postharvest handling of major Oilseeds , Sugar cane, Fibre crop, Narcotics ,Medicinal plants.

UNIT 3

Crop Production in rice in detail: Methods of sowing, Varieties and their duration, various systems of rice cultivation. Raising of nursery, sowing in the main field, Nutrient and water management. Weed Management in rice. Harvest indices in rice.

UNIT 4

Agrostology - Important terms and definitions - Importance in live stock nutrition - classification of fodder crops, economic importance, soil and climatic requirements, varieties, cultural practices, harvesting and yield (Guinea grass, Hybrid Napier, Congo signal, Gamba grass, Setaria, Cereal fodders, Ground legumes, Tree legumes, Pastures) and Forage preservation.

References:

1. Agarwal, P.C. 1990.Oilseeds in India. Oxford and IBH, New Delhi
2. Balasuramaniyan, P. and Palaniappan, SP. 2003.Principles and Practices of Agronomy.Agrobios(India)
3. Barnes, A.C. 1964.The Sugarcane.Interscience Publishers, New Delhi
4. ChiddaSnidngh, Prem Singh and Rajbir Singh.2003. Modern Techniques of Raising Field Crops (2 Ed.). Oxford &IBH, New Delhi.
5. ICAR [Indian Council of Agricultural Research].2006. Hand Book of Agriculture. ICAR, New Delhi
6. KAU [Maharashtra Agricultural University].2007.Package of Practices Recommendations - Crops. Directorate of Extension, Maharashtra Agricultural University, Thrissur
7. Lekshmikantan, M. 1983.Technology in Sugarcane Growing. Oxford & IBH Publishing Co., Pvt. Ltd., New Delhi
8. Prasad, R. (Ed.). 2001. Field Crop Production. ICAR, New Delhi

9. Purseglove, J.W. 1975. Tropical Crops: Monocotyledons. The English Language Book Society and Longman, London
10. Thomas, J., Joy, P.P., Mathew, S., Skaria, B.P., Duethi, P.P. and Joseph, T.S. 2000.Agronomic Practices for Aromatic and Medicinal Plants.Directorate of Arecanut and Spices Development, Kozhikode.
11. Yadav, D.S. 1992. Pulse Crops. Kalyani Publishers., New Delhi.
12. Gurmel Singh, C. Venkataraman, G., Sastry,B. and Joshi, P. 1990.Manual of Soil and Water Conservation Practices. Oxford and IBH Publishing Co., New Delhi.
13. IARI [Indian Agricultural Research Institute]. 1977. Water Requirement and Irrigation
14. Management of Crops in India, IARI Monograph No.4, Water Technology Centre, IARI, New-Delhi.
15. Lenka, D. 2001.Irrigation and Drainage.Kalyani Publishers, New-Delhi.
16. Mal, B. C.2002. Introduction to Soil and Water Conservation Engineering,Kalyani
17. Michael, A.M. 1988.Irrigation Theory and Practice.Vikas Publishing House Pvt. Ltd., New Delhi.
18. Mishra, R.D. and Ahamed, M. 1993.Manual of Irrigation Agronomy.Oxford and IBH Publishing Company Pvt. Ltd.
19. Prihar, S.S. and Sandhu, B.S. 1987. Irrigation of Field crops - Principles and Practices - ICAR, New-Delhi.
20. SankaraReddi, G.H. and Yellamanda Reddy, T.2003 Efficient Use of Irrigation Water. Kalyani Publishing House, New Delhi.
21. Tideman, E.M. 1996. Watershed Management: Guidelines for Indian Conditions. Omega Scientific Publishers, New Delhi.
22. Aldrich, R.J. and Kramer, R.J. 1997.Principles in Weed Management.Panama Publications, New Delhi.
23. Anderson, P.W. 1983. Weed Science - Principles. West Publishing Con.d New York
Ashton, P.M. and Crafts, A.S. 1981. Mode of Action of Herbicides (2 Ed.) Wiley- Inter Science, New York.

Shivaji University, Kolhapur
B. Voc. Part – II (Sust. Agri.) Semester IV

Paper – XXXI
Live Stock Farming (Theory)

Objectives

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

UNIT 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.

UNIT 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.

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.

UNIT 3

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

UNIT 4

Classification of Animal Diseases: Study of major Diseases- Foot and mouth disease (FMD) Rinderpest, Anthrax, Black quarter (BQ), Haemorrhagic Septicaemia (HS). Study of Parasitic Diseases: Brucellosis, Babesiasis, Theleriosis. Diseases of lactating cow: Mastitis, Dystokia Milk fever, Prolaps, Ketosis. Diseases of Calves: Pneumonia, Calf score, Diarrhoea. Poultry Diseases- Ranikhet, Coccidiosis, Bird flu, Parasites of poultry. First aid measures. Disposal of carcasses.

References:

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

Shivaji University, Kolhapur
B. Voc. Part – II (Sust. Agri.) Semester IV

Paper – XXXII
Commercial Crop and Vegetable Production

UNIT 1

Introduction - Importance and scope of vegetable crops of India with special emphasis to Maharashtra. Nutritional importance- nutrient value of vegetables, ANV. Classification of vegetables - types of classification and their bases - Botanical, cultural, thermo classification, classification based on parts used.

UNIT 2

Factors affecting vegetable production- soil, temperature, light, water, nutrients. Basic principles of vegetable production. Nursery, sowing and transplanting, Care and management.

UNIT 3

Types of vegetable farming - Kitchen garden; Market garden; Truck garden; vegetable forcing; Vegetable garden for seed production; Hydroponics, aeroponics, Riverbed system, Terrace Garden etc. Kitchen garden- site selection, principles of layout, cropping schedule. Growth regulators -role of growth regulators in vegetable production and methods of application.

UNIT 4

Production technology of warm season vegetable- Importance, origin, taxonomy, varieties, cultivation, problems and prospects for Solanaceous crops- tomato, brinjal and chilli-Cucurbits- bitter gourd, snake gourd, cucumber, melons, pumpkins, watermelon and ivy gourd. Leguminous crops- vegetable cow pea and winged bean. Other vegetables-okra, amaranthus.

Production cultivation, problems and prospects of potato, cole crops - cabbage & cauliflower. Root crops-carrot, radish, beetroot. Bulb crops- onion, garlic and Leafy vegetables. Technology of cool season vegetables- Importance, origin, taxonomy, Varieties,

Shivaji University, Kolhapur
B. Voc. Part – II (Sust. Agri.) Semester IV

Paper – XXXIII
Weed Management and Fodder Crop Production – Practical

Objectives

- To familiarize with the general characters of weeds and their management.
- To familiarize with cultivation of rice, fibre crops, fodder crops etc.

(4.5 Hrs each)

1. Techniques of weed collection, identification and preparation of herbarium of weeds.
2. Herbicide formulation and identification- Herbicide label information.
3. Study of herbicide application equipments and calibration.
4. Computation of herbicide doses.
5. Field practice of spraying herbicides in the field.
6. Recording observations on the effect of herbicides on crops and weeds.
7. Hand weeding and hoeing using conoweeder in rice.
8. Hoeing and after cultivation in cassava plots.
9. Economics of weed control practices.
10. Visit to areas with problem weeds.
11. Familiarization and planting of various fodder crops and their preservation.
12. After cultivation operations of major crops.

Shivaji University, Kolhapur
B. Voc. Part – II (Sust. Agri.) Semester IV

Paper – XXXIV
Live Stock Farming – Practical

Objectives

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

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
6. Study of Duck breeds: Chara Chemballi, Khaki, Campbell, Vigova
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/Duck Farm

Shivaji University, Kolhapur
B. Voc. Part – II (Sust. Agri.) Semester IV
Paper – XXXV
Commercial Crop and Vegetable Production – Practical

1. Familiarization of different vegetable crops- through field visits and slide show.
2. Main field preparation and planting of transplanted tropical vegetable crops.
3. Main field preparation and planting of direct sown vegetable crops.
4. Preparation of nursery bed, sowing and aftercare of seeds of vegetable crops.
5. Preparation of growth regulator solutions and application.
6. Maturity indices and harvesting of vegetables for vegetable purpose and seed purpose.
7. Identification and familiarization of cool season vegetables.
8. Main field preparation and planting of cool season vegetables.
9. Visit to the farmer's fields in the vegetable growing areas to study the field problems faced by the farmer.

B. Voc. Part – II (Sust. Agri.) Semester IV

Paper –XXXVI
Agricultural Engineering- Farm Machinery, Setting up of a Kitchen Garden

Objectives

- To acquaint with use of farm machineries in field.

Main field preparation, transplanting, nutrient management, weed management, and plant protection aspects by allotting each student 150-200 sq.feet land for setting up of a Kitchen garden purely in mechanized ways: use of tractors and tillers, cultivators and harrows, seed drill, sprayers etc.

NOTE: In addition to practical hours, the students will complete certain time boundoperations after the regular class hours.

- To develop skill in setting up of a mechanized Kitchen Garden; Main field preparation, transplanting, nutrient management, water management, and plant protection aspects are to be considered.