

# **SHIVAJI UNIVERSITY, KOLHAPUR**



“A” Re accredited by NAAC  
(2016) with CGPA 3.16

**Faculty of Interdisciplinary Studies**

**Structure, Scheme and Syllabus for**

**Bachelor of Vocation (B. Voc.)**

**Agriculture**

**Part II- Sem. III & IV**

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

**SHIVAJI UNIVERSITY, KOLHAPUR**

**STRUCTURE AND SYLLABUS OF B.VOC**

**Bachelor of Vocation (B. Voc.)– Agriculture**

**TITLE**

:B. Voc. (Agriculture) Part II(Advanced Diploma)  
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 ( Third Year )

**PATTERN OF EXAMINATION** : Semester Pattern

- **Theory Examination** –At the end of semester as per Shivaji University Rules
- **Practical Examination**–i) In the 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> 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 4<sup>th</sup> and 6<sup>th</sup> 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 vocation I 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**

**Theory examination** (Excluding Business Communication Paper)–

- There will be seven questions carrying equal marks.
- Students will have to solve any five questions.  
Q. No. 1 : Short answer type question with internal choice (Two out of Three )  
Q. No. 2 to Q. No. 6 : Long answer type questions  
Q. No. 7 : Short Notes with internal choice (Two out of Three )

**B )PRACTICAL**

Evaluation of the performance of the students in practical shall be on the basis of semester<sup>2</sup> 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)

**Structure of the Course****B. Voc. – II ( Advanced Diploma ) Semester – III**

Sr. No	Paper No.	Title	Theory /Practical /Project	Marks	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
I. General Education Components								
1	XIX	Fundamentals of Financial Accounting - I	Theory /Practical	50	40	10	3	2
2	XX	Animal Science and Dairy Technology-I	Theory /Practical	50	40	10	3	2
II. Skill Education Components								
3	XXI	Crop Production Technology ( I )	Theory	50	50	--	3	
4	XXII	Olericulture	Theory	50	50	--	3	
5	XXIII	Plant Protection – I	Theory	50	50	--	3	
6	XXIV	Laboratory Work : Crop Production Technology ( I )	Practical	50	--	50		3
7	XXV	Laboratory Work: Olericulture	Practical	50	--	50		3
8	XXVI	Laboratory Work : Plant Protection – I	Practical	50	--	50		3
9	XXVII	Project	-	50	--	50		2

**B. Voc. – II ( Advanced Diploma ) Semester – IV**

B. Voc. II ( Advanced Diploma ) Semester IV								
Sr. No.	Paper No.	Title	Theory /Practical /Project	Marks	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
I. General Education Components								
1	XXVIII	Fundamentals of Financial Accounting – II	Theory /Practical	50	40	10	3	2
2	XXIX	Soil Science – III	Theory /Practical	50	40	10	3	2
II. Skill Education Components								
3	XXX	Crop Production Technology ( II )	Theory	50	50	--	3	
4	XXXI	Floriculture	Theory	50	50	--	3	
5	XXXII	Plant Protection -II	Theory	50	50	--	3	
6	XXXIII	Laboratory Work : Crop Production Technology ( II )	Practical	50	--	50		3
7	XXXVI	Laboratory Work: Floriculture	Practical	50	--	50		3
8	XXXV	Laboratory Work : Plant Protection -II	Practical	50	--	50		3

9	XXXVI	Study Tour	-	50	--	50		2
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**Scheme of Teaching : B. Voc. – Part II (Advanced Diploma ) Semester – III**

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	Animal Science and Dairy Technology-I	4	2	6
II. Skill Education Components					
3	XXI	Crop Production Technology ( I )	4	-	4
4	XXII	Olericulture	4	-	4
5	XXIII	Plant Protection – I	4	-	4
6	XXIV	Laboratory Work : Crop Production Technology ( I )	4	4	4
7	XXV	Laboratory Work: Olericulture	4	4	4
8	XXVI	Laboratory Work : Plant Protection – I	4	4	4
9	XXVII	Project	-	-	-
		Total --	20	16	36

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

B. Voc. Part II (Advanced Diploma) Semester IV					
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	Soil Science – III	4	2	6
II. Skill Education Components					
3	XXX	Crop Production Technology ( II )	4	-	4
4	XXXI	Floriculture	4	-	4
5	XXXII	Plant Protection –II	4	-	4
6	XXXIII	Laboratory Work : Crop Production Technology ( II )	4	4	4
7	XXXVI	Laboratory Work: Floriculture	4	4	4
8	XXXV	Laboratory Work : Plant Protection – II	4	4	4
9	XXXVI	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., Horti, Agri. Economics, Plant Pathology ,Agri. Engineering, Agri. Extension, Soil Science) with NET / SET/Ph.D.  
2) M. A (English) with NET/SET/Ph.D. for Business Communication  
3) M. Com. With NET/SET/Ph.D. for Fundamentals of Financial Accounting

**Eligibility for Laboratory Assistant:** B.Sc.(Agri)/ Diploma in Agriculture

**Staffing Pattern :Teaching:** As per UGC

B.Voc guidelines

**Lab Assistant:** As per UGC B.VOC Guidelines

SHIVAJI UNIVERSITY, KOLAPUR

B. Voc. Part – II

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.

**B. Voc. Part – II**  
**Agriculture**  
**Semester III**

**Paper No. XX : Animal Science and Dairy Technology**

Work Load-6

Theory – 4 Lectures/Week

Practical –2 Lectures/Week/Batch

Total Marks –50

Theory - 40Marks

Practical – 10Marks

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**Objectives :**

- To enable students to-
  - 1) To familiarize with fundamentals of livestock farming.
  - 2) To acquaint with a management of various farm animals
  - 3) To study about value added milk products

**Course content:**

**Unit I - Care and Management of Livestock**

Housing of cattle, calf, bull, bullock, sheep and goat, buffalo

Care and Management of Pregnant and lactating cow and buffalos, cross breed cow, breeding bull, sheep and goat.

Feeding and General Management of livestock

**Unit II – Study of Livestock's**

General Characteristics and features of livestock

Cattle – Gir, Khilar, Deoni, Jeaursey, Holstein Frisen

Buffalo – Murha and Pandharpuri

Goat -Osmanabadi

**Unit III – Meaning and Importance**

Meaning, Scope and importance of Dairy Technology,

Composition of milk, Physio-chemical properties of milk constituents, homogenization of milk

**Unit IV – Dairy Products**

Preparation of milk products-

Concentrated whole milk products- Basundi, Khoa, Mava, Rabri

Coagulated milk products- Curd, Shrikhand, Panner, Flavored milk

Products of clarified butter for industry- Ghee, Lassi,

**Practicals:**

- ❖ Study of different characteristics of cattle, buffalo and goat
- ❖ Determination of age of animals
- ❖ Determination of body weight of animals
- ❖ Detection of adulteration of milk
- ❖ Preparation value-added products – shrikhand, basundi, flavored milk, Curd, Ghee, Lassi

**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. Handbook of animal Husbandry, The I.C.A.R. publication
4. Animal Husbandry & Dairy Science by. Jagdish Prasad.
5. Dairy India Yearbook - 2007 by. P.R. Gupta
6. Hanbook of Veterinary Physician by V.A. Sapre
7. Farm Animal management and feeding practices in India by Thomas &Shashtri
8. Dairy Microbiology by K.C. Mahanta

**Scheme of Internal Practical Evaluation****10 marks**

- |    |                           |        |
|----|---------------------------|--------|
| 1) | Submission of Record book | 5marks |
| 2) | Viva–Voce                 | 5marks |

**B. Voc. Part – II**  
**Agriculture**  
**Semester III**  
**Paper No. XXI : Crop Production Technology ( I )**

Work Load–4

Total Marks –50

Theory – 4 Lectures / Week

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**Objectives:**

To enable student –

- 1) To acquire knowledge of practices of different Kharif crops.
- 2) To know the importance of crops as per its category.

**Course content:**

**Theory-**

**Unit I – Cultivation Practices of Cereal Crops**

Introduction, Soil and Climate, Seeds and Sowing, Irrigation and water management, Major pest and diseases, Harvesting and Threshing of Rice, Maize, Sorghum, Bajara,

**Unit II – Cultivation Practices of Pulse Crops**

Introduction, Soil and Climate, Seeds and Sowing, Irrigation and water management, Major pest and diseases, Harvesting and Threshing of Tur, Green Gram,

**Unit III – Cultivation Practices of Oil Seed Crops**

Introduction, Soil and Climate, Seeds and Sowing, Irrigation and water management, Major pest and diseases, Harvesting and Threshing of Groundnut and Soyabean

**Unit IV – Cultivation Practices of Cash Crops**

Introduction, Soil and Climate, Seeds and Sowing, Irrigation and water management, Major pest and diseases, Harvesting and Threshing of Cotton, Sugarcane

**References:**

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



**B. Voc. Part – II**  
**Agriculture**  
**Semester III**  
**Paper No. XXII : Olericulture**

Work Load–4

Total Marks –50

Theory – 4 Lectures / Week

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**Objectives:**

To enable student –

1. To acquire knowledge of various vegetable and fruit crops
2. To study the concept of kitchen gardening.

**Course content:**

**Unit I- Importance of Vegetables**

Economic Importance of Vegetables, Nutritional Importance of Vegetables, Importance of Vegetables in human diet

**Unit II – Kitchen Gardening**

Meaning of kitchen gardening, Benefits and maintenance of kitchen gardening, kitchen gardening cultivation practices: Leafy vegetable (Palak, Fenugreek, coriander)

**Unit III – Study of Fruit Vegetables**

Cultivation, Soil and Climate, Seeds and Sowing, Irrigation and Water Management, Major pest and diseases, Harvesting of Tomato, Brinjal, Chilli, Cucumber, Okra

**Unit IV – Study of Important Cole Crops, Bulb and Root Crops**

Cultivation, Soil and Climate, Seeds and Sowing, Irrigation and Water Management, Major pest and diseases, Harvesting of Cabbage, Onion, Carrot,

**References :**

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.

**B. Voc. Part – II**  
**Agriculture**  
**Semester III**  
**Paper No. XXIII : Plant Protection - I**

Work Load–4

Total Marks –50

Theory – 4 Lectures / Week

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**Objectives:**

To enable student –

1. To acquire knowledge of insect pest of cereals, pulses and cash crops.
2. To study the diseases and management of various crops

**Course content:**

**Unit I Study of Insects Pest of Cereal Crops**

Introduction, Nature of damage, symptoms, and control majors of pest in Jowar, Wheat, Maize, Bajra,

**Unit II – Pest of Pulse and Cash Crops**

Introduction, Nature of damage, symptoms, and control majors of pest in Cotton, Sugarcane, Gram, Tur,

**Unit III – Diseases of Cereal Crops**

Introduction, Nature of damage, symptoms, and control majors of diseases in Paddy, Jowar, Bajra, Maize,

**Unit IV – Diseases of Other Crops**

Introduction, Nature of damage, symptoms, and control majors of diseases in Groundnut, Cotton, Sugarcane,

**References:**

1. Mani, M. S. 1968. General Entomology. Oxford and IBH Publishing Company, New Delhi.
  2. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.
- Dhaliwal, G. S. and Ramesh Arora. 1998. Principles of Insect Pest Management. Kalyani Publishers, New Delhi.
  - Principles of Plant Pathology – R.S. Singh

**B. Voc. Part – II**  
**Agriculture**  
**Semester III**

**Paper No. XXIV : Laboratory work: Crop Production Technology ( I )**

Work Load-4

Total Marks –50

Practical – 4 Lectures/Week/Batch

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**Practicals :**

- ❖ Identification of important Kharif season crops.
- ❖ Methods of sowing of Kharif crops
- ❖ Effect of sowing time, sowing depth on yield and germination crops.
- ❖ Identification of Kharif season weeds.
- ❖ Top dressing and foliar feeding of nutrients.
- ❖ Study of different methods of seed treatments to sugarcane

**Scheme of practical evaluation**

<b>Internal practical evaluation</b>		<b>50marks</b>
i)	Submission of practical record book	20 marks
ii)	Submission of visit report	15 marks
iii)	Viva–Voce	15 marks

**B. Voc. Part – II**  
**Agriculture**  
**Semester III-**

**Paper No. XXV Laboratory work : Olericulture**

Work Load-4

Total Marks –50

Practical – 4 Lectures/Week/Batch

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**Practicals:**

- ❖ Identification of seed and plants of vegetables crops
- ❖ Preparation of raised beds and raising of seedlings of vegetables
- ❖ Study of morphological characteristics of different vegetable crops
- ❖ Harvesting and preparation of vegetables for market
- ❖ Seed treatment to vegetable seeds

**Scheme of practical evaluation**

<b>Internal practical examination</b>	<b>50marks</b>
i) Preparation of any one from the given	15marks
ii) Submission of practical record book	15marks
iii) Submission of visit report	10marks
iv) Viva–Voce	10marks

**B. Voc. Part – II**  
**Agriculture**  
**Semester III**

**Paper No. XXVI Laboratory Work : Plant Protection - I**

Work Load-4

Total Marks –50

Practical – 4 Lectures/Week/Batch

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**Practicals:**

- ❖ Identification of important pests on different crops
- ❖ Study of lifecycle of various insect pests
- ❖ Identification of diseases of field crops covered in theory
- ❖ Collection and preservation of plant diseased specimens
- ❖ Cares taken while application of pesticides and fungicides

**Scheme of practical evaluation**

<b>Internal practical examination</b>	<b>50 marks</b>
v) Preparation of any one from the given	15marks
vi) Submission of practical record book	15marks
vii) Submission of visit report	10marks
viii) Viva–Voce	10marks

**B. Voc. Part – II (Advance Diploma) Sem-III**  
**B.Voc In Agriculture**  
**Paper No. XXVII**  
**Project Report**

Students must submit detailed project report related to topics of Nursery management, net house/Poly house production, dairy product and field production.

**Scheme of Practical Evaluation**

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

**SHIVAJI UNIVERSITY, KOLAPUR**

**B. Voc. Part – II**

**Agriculture**

**Semester IV Paper No. XXVIII**

**FUNDAMENTALS OF FIANACIAL ACCOUNTING- II**

Work Load - 6 Lectures / Week

Theory – 4

Practical- 2 Lectures / Week

Total Marks – 50

Theory- 40

Practical- 10

**Objectives:** To impart 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](http://www.nos.org) 2) [www.wiki.answers.com](http://www.wiki.answers.com) 3) [Chow.com](http://Chow.com)

**Scheme of External Practical Examination**

- 1) Submission of Record book
- 2) Viva – Voce

**10 marks**

5 marks

5 marks

**B. Voc. Part – II**  
**Agriculture**  
**Semester IV**

**Paper No. XXIX : Soil Science -II**

Work Load-6

Total Marks –50

Theory – 4 Lectures/Week

Theory - 40Marks

Practical –2Lectures/Week/Batch

Practical – 10Marks

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**Objectives:**

To enable students-

- 1) To study the mechanism of soil nutrients.
- 2) To study the problematic soil and their reclamation.

**Course content:**

**Unit I –Mechanism of Soil Nutrients**

Nutrient transport to plants, factors affecting to nutrient availability, Chemistry of NPK and CaMgS

**Unit II – Soil Fertility Evaluation**

Soil Testing, Critical levels of nutrients in soil, plant analysis, Methods of fertilizer recommendation

**Unit III – Problematic Soils**

Testing of Soil quality and health,  
Identification of Waste land and their categorization

**Unit IV – Management**

Reclamation and management of Saline  
Reclamation and management of Sodic soils,  
Reclamation and management of acid soils, etc.

**Practical :**

- ❖ Methods of fertilizer recommendations to crops
- ❖ Factors influencing nutrient use efficiency
- ❖ Reclamation practices in problematic soils
- ❖ Estimation of exchangeable Ca and Mg in soils
- ❖ Estimation of S in plants

**References :**

1. A Text Book of Soil Science – Endian Society of Soil Science
2. ICAR.2006. *Hand book of Agriculture*, ICAR, New Delhi.

**Scheme of Internal Practical Evaluation**

**10 marks**

1. Submission of Record book
2. Viva–Voce

5marks

5marks



**B. Voc. Part – II**  
**Agriculture**  
**Semester IV**  
**Paper No. XXX : Crop Production Technology ( II )**

Work Load–4

Total Marks –50

Theory – 4 Lectures / Week

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**Objectives:**

To enable student –

- 1) To acquire knowledge of practices of different rabi crops.
- 2) To know the importance of crops as per its category.

**Course content:**

**Unit I- Cultivation Practices of Cereal Crops**

Introduction, Soil and Climate, Seeds and Sowing, Irrigation and water management, Major pest and diseases, Harvesting and Threshing of Wheat and Barley

**Unit II – Cultivation Practices of Pulse Crops**

Introduction, Soil and Climate, Seeds and Sowing, Irrigation and water management Major pest and diseases, Harvesting and Threshing of Gram, Pea,

**Unit III – Cultivation Practices of Oil Seed Crops**

Introduction, Soil and Climate, Seeds and Sowing, Irrigation and water management Major pest and diseases, Harvesting and Threshing of Safflower, Sunflower, Linseed

**Unit IV – Cultivation Practices of Medicinal and Aromatic Crops**

Introduction, Soil and Climate, Seeds and Sowing, Irrigation and water management Major pest and diseases, Harvesting and Threshing of Lemon Grass, Citronella

**Reference:**

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. Cox, G.W and Atkins, M.D. 1979. *Agricultural Ecology: An Analysis of World Food Production Systems*. W.H. Freeman and Company, San Francisco
6. Grigg, D.B. 1974. *The Agricultural Systems of the World: An Evolutionary Approach*. Cambridge University Press, Cambridge.

**B. Voc. Part – II**  
**Agriculture**  
**Semester IV**  
**Paper No. XXXI: Floriculture**

Work Load–4

Total Marks –50

Theory – 4 Lectures / Week

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**Objectives:**

To enable student –

1. To study the production technology of various flower crops.
2. To acquire the knowledge about grading and packaging flowers.
3. To study the production technology of medicinal crops.

**Course content:**

**Unit I – Scope and Importance**

Introduction, Classification, scope and Importance: Ornamental Plants, Medicinal Plants and Aromatic Plants

**Unit II - Production Techniques of Important Cut Flowers**

Plantation Techniques, pest and diseases and their management and production of : Rose, Gerbera, Marigold, Carnation

**Unit III – Grading and Packaging**

Process of grading, Types of packaging and packaging materials, Commercial uses of : Loose flowers like Marigold and Jasmine

**Unit IV – Production Technology of Medicinal Plants**

Introduction, Plantation, Harvesting and uses of Ashwagandha, aloe, neem and turmeric

**Reference:**

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. Bose, TK., Mitra, SK. and Sadhu, K. 1986. *Propagation of tropical and subtropical horticultural crops*. Naya Prokash, Calcutta.

**B. Voc. Part – II**  
**Agriculture**  
**Semester IV**  
**Paper No. XXXII : Plant Protection -II**

Work Load–4

Total Marks –50

Theory – 4 Lectures / Week

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**Objectives:**

To enable student –

1. To acquire knowledge of insect pest of vegetable and fruit crops.
2. To study the diseases and their management of fruit crops.
3. To study the methods of disease control.

**Course content:**

**UnitI Study of Insects Pest of Vegetable Crops**

Introduction, Nature of damage, symptoms, and control majors of pest in Tomato, Brinjal, Chilli, Okra, Cucumber, Cabbage

**Unit II – Study of Insects Pest of Fruit Crops**

Introduction, Nature of damage, symptoms, and control majors of pest in Mango, Pomegranate, Citrus Crops, Ber, Grapes

**Unit III – Diseases of Major Fruit Crops**

Introduction, Nature of damage, symptoms, and control majors of diseases in Mango, Pomegranate, Citrus Crops, Ber, Grapes

**Unit IV – Methods of Disease Control**

Management methods of diseases, Chemical Formulation, Methods of application of fungicide,

**References:**

1. Mani, M. S. 1968. General Entomology. Oxford and IBH Publishing Company, New Delhi.
2. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.
3. Dhaliwal, G. S. and Ramesh Arora. 1998. Principles of Insect Pest Management. Kalyani Publishers, New Delhi.
4. Principles of Plant Pathology – R.S. Singh

**B. Voc. Part – II**  
**Agriculture**  
**Semester IV**

**Paper No. XXXIII Laboratory work Crop Production Technology ( II )**

Work Load-4

Total Marks –50

Practical – 4 Lectures/Week/Batch

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**Practicals:**

- ❖ Identification of important rabi Crops
- ❖ Study of yield contributing characters of rabi season crops
- ❖ Study of morphological characteristics of rabi crops
- ❖ Study of oil extraction of medicinal crops
- ❖ Visit to research stations of rabi crops

**Scheme of practical evaluation**

<b>Internal practical examination</b>	<b>50marks</b>
ix) Preparation of any one from the given	15marks
x) Submission of practical record book	15marks
xi) Submission of visit report	10marks
xii) Viva–Voce	10marks

**B. Voc. Part – II**  
**Agriculture**  
**Semester IV**

**Paper No. XXXIV Laboratory Work : Floriculture**

Work Load-4

Total Marks –50

Practical – 4 Lectures/Week/Batch

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**Practical's :**

- ❖ Identification of ornamental and aromatic plants
- ❖ Identification of medicinal Plants
- ❖ Identification of different flowering plants
- ❖ Planning and layout of garden
- ❖ Harvesting and postharvest handling of cut and loose flowers
- ❖ Visit to commercial flower garden

**Scheme of practical evaluation**

<b>Internal practical examination</b>	<b>50marks</b>
xiii) Preparation of any one from the given	15marks
xiv) Submission of practical record book	15marks
xv) Submission of visit report	10marks
xvi) Viva–Voce	10marks

**B. Voc. Part – II**  
**Agriculture**  
**Semester IV-**

**Paper No. XXXV Laboratory Work :Plant Protection -II**

Work Load-4

Total Marks –50

Practical – 4 Lectures/Week/Batch

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**Practicals:**

- ❖ Identification of different insect pests of crops given in theory
- ❖ Study of nature of damage and control measure of vegetable crops pests given in theory
- ❖ Study of nature of damage and control measure of fruit crops pests given in theory
- ❖ Study of symptoms and control measure of fruit crops diseases given in theory
- ❖ Study of preparation of Bordeaux mixture

**Scheme of practical evaluation**

<b>Internal practical examination</b>	<b>50marks</b>
xvii) Preparation of any one from the given	15marks
xviii) Submission of practical record book	15marks
xix) Submission of visit report	10marks
xx) Viva–Voce	10marks