|| शीलं परं भूषणम् ||

Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal, Kolhapur

Mahavir Mahavidyalaya, Kolhapur (Autonomous)

Affiliated to Shivaji University, Kolhapur

Syllabus for Choice Based Credit System (CBCS)

Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**--**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies

(To be introduced from Academic Year 2023 – 24 onwards)

Subject to the revisions & modifications made from time to time

|| शीलं परं भूषणम् ||

Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal, Kolhapur
Mahavir Mahavidyalaya, Kolhapur (Autonomous)
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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**BV D51**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
Subject to the revisions & modifications made from time to time

Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur
(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation in Agriculture**		
Part	**III**	**Semester**	**V**
Course	**Organic Farming & Sustainable Agriculture**	**Course Code**	**BV D51**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**03**	**Contact Hours**	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To acquire knowledge and practices of organic farming.
ii)	To know the importance of organic farming.
iii)	To acquire knowledge and practices of sustainable agriculture
iv)	To know the importance of sustainable agriculture.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units	CR	IH
Unit I : Principle and Scope of Organic Farming	**0.75**	**12**
1.1 Introduction		
1.2 Scope of organic farming		
1.3 Advantages and disadvantages of organic farming		
1.4 Initiative taken by govt., NGO's and other organizations.		
Unit II : Components and methods of organic farming	**0.75**	**12**
2.1 Components of organic farming		
2.2 Organic manures and methods of organic manure production (Vermi-compost, compost, FYM)		
2.3 Organic manures and methods of organic manure production (bio-fertilizer, sewage, sludge and night soil)		
2.4 Certification process and standards of and concept of residue free farming.		
Unit III : – Principles, scope and introduction of sustainable agriculture	**0.75**	**12**
3.1 Introduction		
3.2 Advantages and disadvantages of sustainable agriculture		
3.3 Difference between modern and sustainable agriculture		
3.4 Problems of modern agriculture.		
Unit IV : Sustainable agriculture - problems and its indicators.	**0.75**	**12**
4.1 Indicators of sustainability		
4.2 Adaptation and mitigation		
4.3 Conservation agriculture strategies in agriculture		
4.4 HEIA, LEIA and LEISA and its techniques for sustainability.		

D) Reference Materials	
D1) Text Books for Reading	
1.	Principal of organic farming by S. R. Reddy
2.	Havlin, J. L., Beaton, J. D., Tisdale, S.L., and Nelsothn, W.L. 2006. *Soil Fertility and Fertilizers: An Introduction to Nutrient Management* (7 ed.)
3.	*Fundamentals of Agronomy*, Oxford & IBH Publishing Co.
4.	*Principles and Practices of Agronomy* Agro Bios (India) Ltd., Jodhpur.
D2) Books for Reference	
1.	*Handbook of Agriculture*, ICAR New Delhi
2.	Principles and practices of organic farming by R. Balasubramanian, K. Balkrishnan and K. Sivasubramanian.
3.	Organic crop production (Principles and practices Vol-I : Principles and General Aspects) by J. P. Sharma

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will understand how to prepare organic manures and Students will know about importance of organic farming.	
CO2	Students will learn how organic farming relates to the economy and environments, both currently and in the future.	
CO3	Students will acquire knowledge of practices of Sustainable Agriculture.	
CO4	Students will learn how Sustainable Agriculture relates to the economy and environments, both currently and in the future.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

H) Suggested techniques for Continuous Internal Evaluation 10 Marks)		
1.	Home assignments	10
2.		
3.		
4.		
5.	Total Marks	10

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	Total Marks	40

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Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal, Kolhapur
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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**BV D52**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
Subject to the revisions & modifications made from time to time

Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur
(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture CBCS**		
Part	**III**	**Semester**	**V**
Course	**Crop Physiology & Plant Breeding**	**Course Code**	**BV D52**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**03**	**Contact Hours**	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To study the plant water relationship.
ii)	To study the physiological process in a plant.
iii)	To study the plant breeding.
iv)	To study the breeding methods in pollinated crops.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units	CR	IH
Unit I : Plant water relations	**0.75**	**12**
1.1 Introduction- Importance of crop physiology in Agriculture, Role & Significance of Water- Diffusion, imbibition, Osmosis & its significance, plasmolysis		
1.2 Mode of water absorption, (Active & Passive), Translocation of solute. phloem & xylem Transport. physiological role of nutrient.		
1.3 Transpiration-types, significance,Factors affecting Transpiration		
1 .4 Guttation, antitranspirant.		
Unit II : Photosynthesis and Respiration	**0.75**	**12**
2.1 Photosynthesis, requirement of photosynthesis, factors affecting photosynthesis		
2.2Photoperidosm-short day, long day & day neutral plants, photochrome, role of photochrome in flowering and regulation of Flowering.		
2.3 Respiration-Glycolysis, Protein & Fat synthesis		
2.4Transpiration of stimules, theories of Flowering, seed germination, Abscission and senescence, physiological effect on crop productivity		
Unit III : Introduction Concept, nature and role of plant breeding	**0.75**	**12**
3.1 Introduction- Defination, aim, objective & Scope of plant Breeding, Historical development of plant breeding.		
3.2 Nature and role of plant breeding, measure achievements and future prospects, genetics in relation to plant breeding		
3.3 Sexual reproduction,Their classification & significance in Plant breeding.		
3.4 Modes of Reproduction-asexual reproduction (vegetative reproduction & apomixis		
Unit IV : Breeding methods in self & Cross pollinated crops	**0.75**	**12**
4.1 – Breeding methods in self pollinated crops Genetic basis and breeding methods in self-pollinated crops-mass selection and pure line selection,		

4.2. hybridization techniques.		
4.3 – Breeding methods in cross pollinated crops Genetic basis and methods of breeding in cross pollinated crops, mode of selection, population improvement.		
4.4 recurrent selection scheme, heterosis and inbreeding depression,		

D) Reference Materials	
D1) Text Books for Reading	
1.	Jain, J. K 2007.Fundamentals of plant physiology,
2.	Fundamentals of plant physiology, S. Chand and company Ltd.,
3.	Purohit S. N & B. K Sinha, 2006. Plant physiology. Vikas Publishing House
4.	Phundan singh,2006 Essential of Plant Breeding, Kalyani Publishers, New Delhi.
5.	Singh B.D 2006, Plant Breeding: Principle & Methods Kalyani Publishers, New Delhi.
D2) Books for Reference	
1.	Fundamentals of plant physiology, S. Chand and company Ltd.,
2.	Plant physiology, Vikas publishing house Pvt. Ltd., New Delhi,
3.	g, Singh, B. D. 2001- Fundamentals of genetics, kalyani publishers.
4.	Allord, R.W.1960. Principle of Plant Breeding.John Wiley & Sons, New York

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will understand the plant water relationship.	
CO2	Students will know the physiological process in a plant.	
CO3	Students will get knowledge about the plant breeding & classification of pollinated crops.	
CO4	Students will learn the breeding methods in self and cross pollinated crops.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	10
2.		
3.		
4.		
5.	Total Marks	10

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	Total Marks	40

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**BV D53**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies

(To be introduced from Academic Year 2023 – 24 onwards)

Subject to the revisions & modifications made from time to time

Mahavir Mahavidyalaya, Kolhapur (Autonomous)

Affiliated to Shivaji University, Kolhapur

(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture CBCS**		
Part	**III**	Semester	**V**
Course	**Seed Technology**	Course Code	**BV D53**
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 24**
Total Credits	**03**	Contact Hours	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To understanding knowledge of seed biology, quality, storage and certification.
ii)	To study seed processing.
iii)	To study the different classes in seed production.
iv)	To study the Marketing Structure, Marketing Organization of seed.

C) Course Syllabi:

(CR = Credits / IH: Instructional Hours)

Units	**CR**	**IH**
Unit I : Introduction	0.75	12
1.1 Seed definition, Seed development, Maturation & chemical composition, difference between seed & grain.		
1.2 Introduction to seed production & seed Technology, Types of seed production.		
1.3 Scope & Importance of seed production, scope for seed export		
1.4 Concept of seed technology in crop improvement its role & goal.		
Unit II : Selection & Maintenance of seed production	0.75	12
2.1 Seed quality, definition, characters of good quality seed, factors affecting seed quality.		
2.2 Deterioration of crop varieties, factor affecting deterioration & their control.		
2.3 Maintenance of genetic purity during seed production		
2.4 Seed policy, seed act, seed control order & Physical purity.		
Unit III : Seed Production	0.75	12
3.1 Different classes of seed and Multiplication of seed Nucleus, Breeder, Foundation, Register, Certified & Truthful Seed		
3.2 Production of nucleus & Breeder seed.		
3.3 Foundation & Certified seed Production of Rice (Varieties & Hybrids)		
3.4 Foundation & Certified seed Production of Vegetable (Chilli) (Varieties & Hybrid)		
Unit IV : Seed Processing & Marketing	0.75	12
4.1 Seed processing & Cleaning, Gradation, Seed treatment, Importance of seed Treatment.		
4.2 Seed Packaging & Seed Storage, stages of seed storage, Factors affecting seed storage.		
4.3 Definition of seed Certification, phases of seed types, certification & procedure for seed certification.		
4.4 Seed Marketing, Marketing Structure, Marketing Organization.		

D) Reference Materials	
D1) Text Books for Reading	
1.	Seed Technology Agarwal R.L.
2.	Principle of seed technology, Phundan Singh; Kalyani Publication, New Delhi.
3.	Handbook of Seed Science and Technology, Amarjit s.
4.	Principle of seed technology by Prof. N.N. Patel, Gujrat.
D2) Books for Reference	
1.	Seed technology, R.L. Agrawal
2.	Principle of seed technology, Phundan Singh; Kalyani Publication, New Delhi.
3.	Handbook of Agriculture, ICAR, New Delhi.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will gain knowledge on concepts and principles of Seed production	
CO2	Student will get knowledge about seed processing.	
CO3	Students will understand the Marketing Structure, Marketing Organization of seed.	
CO4	Student will understand various Different classes of seed and methods of seed production.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	10
2.		
3.		
4.		
5.	**Total Marks**	**10**

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	Total Marks	40

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Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal, Kolhapur
Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur

Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**BV D54**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
Subject to the revisions & modifications made from time to time

Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur
(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation in Agriculture**		
Part	**III**	**Semester**	**V**
Course	**Postharvest Management, Value Addition of Fruits & Vegetables**	**Course Code**	**BV D54**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**03**	**Contact Hours**	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To study the post harvest management practices of fruit crops.
ii)	To study on the physiology, biochemistry and on various technologies involved relevant to shelf life extension.
iii)	To study the post harvest management practices of vegetables.
iv)	To study the value addition of fruits and vegetable.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units	CR	IH
Unit I : History, factors, introduction and importance of PHM	**0.75**	**12**
1.1 History, Importance and scope of fruit and vegetable preservation in india		
1.2 pre-harvest factors (Cultural operations, pre harvest treatment and maturity indices)		
1.3 post-harvest factors (Curing, degreening, pre-cooling, disinfection)		
1.4 post-harvest factors (waxing, ripening, packaging, transportation, storage and irradication)		
Unit II : Post harvest management of horticultural crops	**0.75**	**12**
2.1 Potato, tuber crops, Sweet potato		
2.2 Cut flowers		
2.3 Coconut, Leafy vegetable		
2.4 Spices and Condiments.		
Unit III : Introduction and Concept of value addition	**0.75**	**12**
3.1 Introduction		
3.2 scope, concept of value addition		
3.3 importance of value addition and testing of food products order.		
3.4 principle and methods of preservation.		
Unit IV : Processing of fruits and vegetables	**0.75**	**12**
4.1 Preparation of Jam, jelly, marmalade		
4.2 preparation of pickles (Lime, Green Chilli, Cucumber)		
4.3 Preparation of fruit juice (Mango, Citrus)		
4.4 Preparation of Tomato - Ketchup		

D) Reference Materials	
D1) Text Books for Reading	
1.	Handbook of Horticulture (2002) Chadha, K.L. ICAR, New Delhi
2.	Preservation for fruits and vegetables. Principle and practices. By Shrivastava & Sanjeev Kumar.
3.	Fundamentals of Horticulture 2014 Kausal Kumar Misra and Rajesh Kumar Biotech Books
4.	Hartmann, HT. and Kester, DE. 1986. *Plant propagation - Principles and practices*. Prentice-Hall, New Delhi.
D2) Books for Reference	
1.	Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York.
2.	Post harvest biotechnology of vegetables by Salunke, D. K.
3.	Chadha, K.L. 2003. Handbook of Horticulture, ICAR, New Delhi. Choudhary, B. 1983. Vegetable National Trust, New Delhi.
4.	Post harvest physiology, handling, utilization of tropical and subtropical fruits and vegetables. By Pantastico, E. R.
E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will learn post harvest management practices of fruit crops.	
CO2	The students will learn more on the physiology, biochemistry and on various technologies involved relevant to shelf life extension.	
CO3	Students will learn post harvest management practices of vegetables.	
CO4	The students will learn value addition of fruits and vegetable.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	10
2.		
3.		
4.		
5.	Total Marks	10

I) Question Paper Pattern (40 Marks)		
Q. No.	Nature / Type of Question	Marks
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	Total Marks	40

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Syllabus for Choice Based Credit System (CBCS)
Advance Diploma (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**BV D51**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
Subject to the revisions & modifications made from time to time

Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur
(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation in Agriculture**		
Part	**III**	**Semester**	**V**
Course	**Organic Farming & Sustainable Agriculture**	**Course Code**	**BV D51 (Practical)**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**04**	**Contact Hours**	**06 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To Know the importance of sustainable agriculture.
ii)	To study the application of the green manuring crops
iii)	To study the Methods of Compost and Vermicompost.
iv)	To study of preparation methods of various organic fertilizers.

C) Course Syllabi: (CR = Credits / IH: Instructional Hours)		
Practical	**CR**	**IH**
1. To study the sustainable agriculture problems and its impact on agriculture.	**4**	**75**
2. Application and study of the green manuring crops		
3. Application and study the biofertilizers.		
4. Preparation of vermi-compost and their methods.		
5. Preparation of compost and their methods.		
6. Preparation of organic pesticides. (Neem Ark, Lamit Ark, Dashparni Ark)		
7. Preparation of organic fertilizers (Jeevamrut, Amritpani, Bijamrut)		
8. Visit of organic farms to study the various components and their utilization.		

D) Reference Materials	
D1) Text Books for Reading	
1.	Principal of organic farming by S. R. Reddy
2.	Havlin, J. L., Beaton, J. D., Tisdale, S.L., and Nelsothn, W.L. 2006. *Soil Fertility and Fertilizers: An Introduction to Nutrient Management* (7 ed.)
3.	*Fundamentals of Agronomy*, Oxford & IBH Publishing Co.
4.	*Principles and Practices of Agronomy* Agro Bios (India) Ltd., Jodhpur.

D2) Books for Reference	
1.	*Handbook of Agriculture*, ICAR New Delhi
2.	Principles and practices of organic farming by R. Balasubramanian, K. Balkrishnan and K. Sivasubramanian.
3.	Organic crop production (Principles and practices Vol-I : Principles and General Aspects) by J. P. Sharma

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will Know the importance of sustainable agriculture.	
CO2	Students will get the knowledge about application of the green manuring crops	
CO3	Students will understand the Methods of Compost and Vermicompost.	
CO4	Students will get knowledge about preparation methods of various organic fertilizers.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

I) Question Paper Pattern (40 Marks)		
Q. No.	Nature / Type of Question	Marks
1.	Practical	25
2.	Submission Practical record book and project report	15
3.	Viva-voce	10
4.		
5.	Total Marks	50

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**BV D52**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
Subject to the revisions & modifications made from time to time

Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur
(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture CBCS**		
Part	**III**	**Semester**	**V**
Course	**Crop Physiology & Plant Breeding**	**Course Code**	**BV D52 (Practical)**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**04**	**Contact Hours**	**06 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To study the floral structure of self & cross pollinated crops.
ii)	To study the Emasculation and hybridization techniques in self & cross pollinated crops.
iii)	To study the measurement of transpiration and structure of stomata.
iv)	To study the Measurement of leaf area by different methods.

C) Course Syllabi: (CR = Credits / IH: Instructional Hours)		
Practical	**CR**	**IH**
1. Study of floral structure of self pollinated crops.	**4**	**75**
2. Study of floral structure of cross pollinated crops.		
3. Emasculation and hybridization techniques in self pollinated crops		
4. Emasculation and hybridization techniques in cross pollinated crops		
5 Study of male sterility		
6. Measurement of leaf area by different methods		
7. Measurement of transpiration and study of structure of stomata		
8. Study of growth analysis		
9. Field visit		

D) Reference Materials

D1) Text Books for Reading

1.	Plant physiology, Vikas publishing house Pvt. Ltd., New Delhi
2.	Purohit, S. S. 2005,
3.	S. N. and Sinha, B. K. 2006, Plant physiology,
4.	Singh B.D 2006, Plant Breeding: Principle & Methods Kalyani Publishers, New Delhi.

D2) Books for Reference

1.	ICAR.2006. Handbook of Agriculture, ICAR, New Delhi.
2.	Plant Physiology, student edition, Jodhpur.
3.	Fundamentals of plant physiology, S. Chand and company Ltd., New Delhi, P

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will Know the floral structure of self & cross pollinated crops.	
CO2	Students will understand the Emasculation and hybridization techniques in self & cross pollinated crops.	
CO3	Students will get knowledge about the measurement of transpiration and structure of stomata.	
CO4	Students will get the knowledge about the measurement of leaf area by different methods.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

I) Question Paper Pattern (40 Marks)		
Q. No.	Nature / Type of Question	Marks
1.	Practical	25
2.	Submission Practical record book and project report	15
3.	Viva-voce	10
4.		
5.	Total Marks	50

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**BV D53**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
Subject to the revisions & modifications made from time to time

Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur
(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture CBCS**		
Part	**III**	**Semester**	**V**
Course	**Seed Technology**	**Course Code**	**BV D53 (Practical)**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**04**	**Contact Hours**	**06/ Week**
Course Title	**--**		

B) Course Objectives:	
i)	To study the seed production of cereals, pulses and oil seed crops.
ii)	To study the processing, testing
iii)	To identify the seed tag.
iv)	To study of processing of seed drying and seed treatment.

C) Course Syllabi: (CR = Credits / IH: Instructional Hours)		
Practical	**CR**	**IH**
1. Seed production in cereals (bajra, maize, sorghum).	**4**	**75**
2 Seed production in pulses (green gram, pea, gram		
3. Seed production in oil seeds (groundnut, soybean).		
4. Seed sampling and testing (purity, germination, viability).		
5. Seed processing (Drying and Seed treatments)		
6. Identification of Seed Tag		
7. Visit to seed production plot.		
8. Seed Testing Laboratory or Processing industry Visit.		
9. Study of Marketing Channel..		

D) Reference Materials	
D1) Text Books for Reading	
1.	Oxford and IBH Publishing company, New Delhi.
2.	Principle of seed technology, Phundan Singh; Kalyani Publication, New Delhi.
3.	Handbook of Seed Science and Technology, Amarjit s.
4.	Principle of seed technology by Prof. N.N. Patel, Gujrat.
D2) Books for Reference	
1.	Seed technology, R.L. Agrawal.
2.	Oxford and IBH Publishing company
3.	Principle of seed technology, Phundan Singh; Kalyani Publication, New Delhi.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation

iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will know the seed production of cereals, pulses and oil seed crops.	
CO2	Students will understand the processing, testing.	
CO3	Students will get knowledge about identifying the seed tag.	
CO4	Students will understand the processing of seed drying and seed treatment.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	Practical	25
2.	Submission Practical record book and project report	15
3.	Viva-voce	10
4.		
5.	Total Marks	50

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Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal, Kolhapur
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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**V**
Course Code	**BV D54**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
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Mahavir Mahavidyalaya, Kolhapur (Autonomous)
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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation in Agriculture**		
Part	**III**	**Semester**	**V**
Course	**Postharvest Management, Value Addition of Foods & Vegetables.**	**Course Code**	**BV D54 (Practical)**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**04**	**Contact Hours**	**06 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To understand different types of grading of Fruit and Vegetables.
ii)	To study the preparation methods of various value added Products.
iii)	To study the various packaging materials.
iv)	To study the various storage methods.

C) Course Syllabi: (CR = Credits / IH: Instructional Hours)		
Practical's	**CR**	**IH**
1. To study the different types of grading of fruits and vegetables	**4**	**75**
2. Applications and use of different types of packaging materials		
3. Preparation of Ready to Serve (RTS), squash, nectar and cordial		
4. Preparation of jam and jelly		
5. Preparation of marmalade and fruit candy		
6. Preparation of marmalade and fruit candy		
7. Preparation of Pickles		
8. To study the storage methods.		
9. Visit to the Fruit and Vegetable Processing Industry.		

D) Reference Materials	
D1) Text Books for Reading	
1.	Handbook of Horticulture (2002) Chadha, K.L. ICAR, New Delhi
2.	Preservation for fruits and vegetables. Principle and practices. By Shrivastava & Sanjeev Kumar.
3.	Fundamentals of Horticulture 2014 Kausal Kumar Misra and Rajesh Kumar Biotech Books
4.	Hartmann, HT. and Kester, DE. 1986. *Plant propagation - Principles and practices*. Prentice-Hall, New Delhi.

D2) Books for Reference	
1.	Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York.
2.	Post harvest biotechnology of vegetables. By Salunke, D. K
3.	Chadha, K.L. 2003. Handbook of Horticulture, ICAR, New Delhi. Choudhary, B. 1983. Vegetable National Trust, New Delhi.
4.	Post harvest physiology, handling, utilization of tropical and subtropical fruits and vegetables. By Pantastico, E. R.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will understand the different grades of Fruit and Vegetables.	
CO2	Students will get the knowledge about preparation methods of various Value added Products.	
CO3	Students will understand the various packaging materials.	
CO4	Students will get knowledge about various storage methods.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	Practical	25
2.	Submission Practical record book and project report	15
3.	Viva-voce	10
4.		
5.	Total Marks	50

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**VI**
Course Code	**BV D61**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
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Mahavir Mahavidyalaya, Kolhapur (Autonomous)
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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation in Agriculture**		
Part	**III**	**Semester**	**V**
Course	**Farming system & watershed Management**	**Course Code**	**BV D61**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**03**	**Contact Hours**	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To Acquire knowledge of farming system
ii)	To Understand the importance of watershed management
iii)	To Gain the knowledge of rainfed agriculture
iv)	To Study of Cropping and farming systems

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units	CR	IH
Unit I : Scope, Importance and concept of farming system	**0.75**	**12**
1.1 Scope, importance, concept of farming system		
1.2 Definition of farming system. characteristics of Indian agriculture		
1.3 Classification of farming system, advantage and disadvantage of farming system		
1.4 components of farming system		
Unit II : Study the cropping scheme and pattern	**0.75**	**12**
2.1 Introduction, cropping system, classification of cropping system, multiple cropping system, parallel multiple & sequential multiple cropping		
2.2 Crop rotation, characteristics of good crop rotation, advantage of an ideal crop rotation, cropping system under low land, irrigated up land		
2.3 Plant interactions, competitive interactions, non competitive, complementary competitive		
2.4 Choice and size of enterprises, Allied enterprises, According to size of the farm		
Unit III : Rainfed Agriculture (Drought)	**0.75**	**12**
3.1 Introduction, concept of rainfed agriculture, history of rainfed agriculture		
3.2Types, problems and prospects of rainfed agriculture in India, soil and climatic conditions prevalent in rainfed areas		
3.3 Characteristics of rainfed farming, management of crops in rain fed agriculture, and drought and its types		
3.4 Effects of drought on physio-morphological characteristics of the plants		
UNIT IV : Watershed Management Practices	**0.75**	**12**
4.1 Watershed management, introduction, concept and its objective, Structures.		
4.2 Principles and components of watershed management, factors affecting watershed management		
4.3 Introduction, water harvesting, importance and techniques, efficient utilization of water through soil and crop management practices		
4.4 Management of crops in rainfed areas, contingent crop planning.		

D) Reference Materials	
D1) Text Books for Reading	
1.	Principles of Agronomy S. R. Reddy
2.	Principles and practices of agronomy by p. Balasubramanium
3.	Organic farming Theory and Practice K.Annadurai
4.	Watershed Management by Mihir K. Maitra
D2) Books for Reference	
1.	Cropping system in the tropics, principles and management y S. P. Palaniappan and k. sivraman
2.	Introduction to farming system By Michael and Hanies (1982)
3.	Organic farming for sustainable agriculture By A. K. Dharna.
4.	Farming system and sustainable agriculture by Dr. Swapnil P. Deshmukh, Bharuch

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will the acquire knowledge of farming system	
CO2	Students will Understand the importance of watershed management	
CO3	Students will Gain the knowledge of rainfed agriculture	
CO4	Students will know the Cropping and farming systems	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	10
2.		
3.		
4.		
5.	Total Marks	10

I) Question Paper Pattern (40 Marks)		
Q. No.	Nature / Type of Question	Marks
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	Total Marks	40

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**VI**
Course Code	**BV D62**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
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Mahavir Mahavidyalaya, Kolhapur (Autonomous)
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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture**		
Part	**III**	**Semester**	**VI**
Course	**Agriculture Economics & Extension**	**Course Code**	**BV D62**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**03**	**Contact Hours**	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To study the fundamentals of agricultural economics.
ii)	To study the production function and marketing of commodities.
iii)	To study the fundamentals of agricultural extension
iv)	To study the concept of rural development.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units	CR	IH
Unit I : Fundamentals of agricultural. Economics and financial co-operation	**0.75**	**12**
1.1 Meaning, Scope of agricultural Economics.		
1.2 Definitions of, economics, micro and macro economics, basic concept: goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare		
1.3. Agriculture finance meaning, scope and significance, credit analysis, four "R" and three "C" of credit.		
1.4 Introduction to higher financial institution- RBI, NABARD, IMF, RRB, commercial bank, institutional and non institutional sources		
Unit II : Production function and marketing of commodities	**0.75**	**12**
2.1 Concept of production function and its type, use of production function in decision making, factor-product, factor-factor, product-product relationship.		
2.2 Law of equi-marginal, or principle of opportunity cost, law of comparative advantage, least cost combination, Law of marginal return, concept of elasticity of production.		
2.3 Definition of agricultural marketing, market structure, classification and characteristics of agricultural marketing, marketing functionaries and channels, marketing cost, margin and price spread.		
2.4 Risk in co-operative marketing, role of government in agriculture marketing and problems in marketing of agriculture commodities.		
Unit III : Fundamentals of agriculture extension education	**0.75**	**12**
3.1 Introduction, Meaning of agricultural extension.		
3.2 Definition and types of extension education.		
3.3 Objectives, principles of extension education		
3.4 Various agriculture development programs launched by ICAR & govt. of India (IADP, HYVP, KVK, IVLP, etc)		

Unit IV : Rural development		
4.1 Concept, meaning, definition of rural development.	**0.75**	**12**
4.2 Leaders and Leadership, Functions of Leader, Classification of Leader, Characteristics of Leader, Advantages of Leaders in Extension.		
4.3 Various rural development programs launched by govt. of India, Co-operative Farming (FPO, FPC, Contract)		
4.4 Community development, meaning, definition, concept & its principles.		

D) Reference Materials

D1) Text Books for Reading

1.	Introduction To Agricultural Economics by S. Singh (Author), V.Mehla (Author)
2.	Agricultural Economics by S. Subba Reddy
3.	Fundamentals of Agriculture Extension Education by Talukdar RK and Barman U
4.	Fundamentals of Agricultural Extension Education by Sagar Mondal, Kalyani Publishers

D2) Books for Reference

1.	ICAR.2006. *Hand Book Of Agriculture*, ICAR, New Delhi.
2.	Handbook of Agricultural Economics by Christopher Barrett, David Just
3.	Principles of Agricultural Economics by David Colman and Trevor Young Department of Agricultural Economics, University of Manchester
4.	Handbook of Agricultural Extension by Saleem Ashraf Zakaria Yousaf Hassan Gulfam Hassan Amjad S. Gondal

E) Suggested methods of Teaching:

i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will understand about fundamentals of agricultural economics.	
CO2	Students will know about the production function and marketing of commodities.	
CO3	Students will understand about fundamentals of agricultural extension	
CO4	Students will know about the concept of rural development and various rural development programs.	

G) Scheme of Course Evaluation

1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)

1.	Home assignments	10
2.		
3.		
4.		
5.	Total Marks	10

I) Question Paper Pattern (40 Marks)

Q. No.	Nature / Type of Question	Marks
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	Total Marks	40

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**VI**
Course Code	**BV D63**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
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Mahavir Mahavidyalaya, Kolhapur (Autonomous)

Affiliated to Shivaji University, Kolhapur

(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture CBCS**		
Part	**III**	Semester	**VI**
Course	**Agricultural Engineering**	Course Code	**BV D63**
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 24**
Total Credits	**03**	Contact Hours	**4 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To acquire knowledge of soil and water conservation
ii)	To learn the greenhouse technology
iii)	To provide knowledge of the farm power and machineries
iv)	To study the seed drill and processing

C) Course Syllabi:

(CR = Credits / IH: Instructional Hours)

Unit I : Study soil and water conservation	**CR**	**IH**
1.1 Introduction, Importance of soil and water conservation Definition and scope and agents of soil erosion.	**0.75**	**12**
1.2 Types of soil erosion, Geological erosion, accelerated erosion Causes and ill effects of soil erosion		
1.3 water erosion, forms of erosion, gully classification and control Measures, Introduction to contouring, strip cropping, contour bund, graded bund.		
1.4 Types of bench terracing, wind erosion, its mechanism, and its control measures		
Unit II : Study of greenhouse technology		
2.1 Introduction, Greenhouse Effect, Importance and scope of Greenhouse.	**0.75**	**12**
2.2 Types of greenhouses, construction and materials, irrigation System of Greenhouse, equipment's used in Greenhouse		
2.3 Plant responses of greenhouse environment, planning and Design of greenhouse.		
2.4 Cost estimation and economic analysis of greenhouse.		
Unit III : Farm power and machineries	**0.75**	**12**
3.1 Introduction, definition of farm power, sources of farm power, Classification of farm power.		
3.2 Biomass energy, classification of biogas plant, Floating drum type, Fixed dome type, difference Between floating and fixed Type biogas plant.		
3.3 Heat Engine, classification of heat engine, IC engine. Different parts of IC engine. It's working principle, two Stroke, four stroke engine, and air cleaner.		
3.4 Cooling system of IC engine, lubrication system, study of Fuel Supply system of IC engine.		

Unit IV: Tools and tillage implements.		
4.1 Introduction, tillage, objectives of tillage, classification of tillage	**0.75**	**12**
4.2 Study of primary tillage and secondary tillage implements. Mould board and disc plough.		
4.3 Seed & Sowing Implements.		
4.4 Harvesting Technology (Combine Harvester)		

D) Reference Materials	
D1) Text Books for Reading	
1.	Introductory Soil Science by D.K. Das.
2.	Textbook of Soil Science by T. Biswas, S Mukherjee
3.	Agricultural engineering by jagadishwar Sahay. fourth Edition,2010
4.	Principal of farm machines by A C Srivastava, Oxford and IBH publishing co. delhi
D2) Books for Reference	
1.	A text book of Soil Science – Indian Society of Soil Science
2.	Greenhouse Technology – Arupratan Ghosh
3.	Farm engine and Tractors by HE Gulvin (2001) McGraw hill.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will gain knowledge on concepts and principles of Soil and water conservation.	
CO2	Students will gain knowledge of greenhouse technology.	
CO3	Students will learn the role of farm power and machineries.	
CO4	Students will understand the types of tools and tillage equipments.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	10
2.		
3.		
4.		
5.	Total Marks	10

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	Total Marks	40

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**VI**
Course Code	**BV D64**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

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A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture**		
Part	**III**	**Semester**	**VI**
Course	**Spices and Condiments, Aromatic and Medicinal Plants**	**Course Code**	**BV D64**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**03**	**Contact Hours**	**4 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To understand plantation management practices of spices, condiments, aromatic and medicinal plants.
ii)	To know the various operations carried out in plantation of spices, condiments, aromatic and medicinal plants.
iii)	To study the importance of different spices, condiments, aromatic and medicinal plants.
iv)	To increase production and productivity of spices, condiments, aromatic and medicinal plants by different propagating method.

C) Course Syllabi: (CR = Credits / IH: Instructional Hours)		
Units	**CR**	**IH**
Unit I : Scope and Importance	**0.75**	**12**
1.1 Introduction of Spices, Condiments.		
1.2 Importance of Spices, Condiments.		
1.3 Scope of Spices, Condiments.		
1.4 Classification of spices and condiments.		
Unit II : Study of spices and condiments	**0.75**	**12**
2.1 Uses, Botanical distribution		
2.2 Study of Soil and climate		
2.3 Varieties, and harvesting		
2.4 Black pepper, Small cardamom, Ginger, Turmeric, Clove, Nutmeg, Cinnamon, Fenugreek, Coriander, Cumin, Chilli		
Unit III : Scope and Importance of Medicinal and Aromatic plants	**0.75**	**12**
3.1 Introduction of medicinal and aromatic plants.		
3.2 Scope and Importance of medicine and aromatic plants.		
3.3 Importance of Medicinal and Aromatic Plants.		
3.4 Classification of medicinal and aromatic plants.		

Unit IV : Study of Medicinal and Aromatic Plants		
4.1 Uses, Botanical classification of Medicinal and Aromatic Plants.	**0.75**	**12**
4.2 Study of Soil and climate, varieties, and harvesting		
4.3 Medicinal (Aloe, Belladona, Senna, Ashwagandha, Sarpgandha, Safed musali, Neem, Periwinkle)		
4.4 Aromatic plants (Davana, Lemon Grass, Rose geranium, Japanese mint, java citronella)		

D) Reference Materials

D1) Text Books for Reading

1.	Handbook of Horticulture (2002) Chadha, K.L. ICAR, New Delhi
2.	Introduction to Spices Plantation Crops Medicinal and Aromatic Plants by N. Kumar
3.	Fundamentals of Horticulture 2014 Kausal Kumar Misra and Rajesh Kumar Biotech Books
4.	Bose, TK., Mitra, SK. and Sadhu, K. 1986.*Propagation of tropical and subtropical horticultural crops*. Naya Prokash, Calcutta.

D2) Books for Reference

1.	Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York
2.	Hartman, HT. and Kester, DE. 1986. Plant propagation - Principles and Pratices. Prentice - Hall, New Delhi
3.	Chadha, K.L. 2003. Handbook of Horticulture, ICAR, New Delhi. Choudhary, B. 1983. Vegetable National Trust, New Delhi.

	E) Suggested methods of Teaching:
i)	Online teaching / Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will understand plantation management practices of spices, condiments, aromatic and medicinal plants.	
CO2	Students will know the various operations carried out in plantation of spices, condiments, aromatic and medicinal plants.	
CO3	Students will know about the importance of different spices, condiments, aromatic and medicinal plants.	
CO4	Students will get knowledge about increase production and productivity of spices, condiments, aromatic and medicinal plants by different propagating method.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	10
2.		
3.		
4.		
5.	Total Marks	10

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	Total Marks	40

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**VI**
Course Code	**BV D61**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture CBCS**		
Part	**III**	**Semester**	**VI**
Course	**Farming System & Watershed Management**	**Course Code**	**BVD 61 (Practical)**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**04**	**Contact Hours**	**06 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To Acquire knowledge of farming system
ii)	To Understand the importance of watershed management
iii)	To Gain the knowledge of rainfed agriculture
iv)	To Study of Cropping and farming systems

C) Course Syllabi: (CR = Credits / IH: Instructional Hours)		
Practical	**CR**	**IH**
1. Understanding the cropping scheme	**4**	**75**
2. Preparation of cropping scheme for irrigated situations		
3. Preparation of cropping scheme for dry land situations		
4. Study about cultural practices for mitigation moisture stress.		
5. Studying the concept of management of crops in rainfed areas		
6. Understanding factors affecting watershed management		
7. Visit to rainfed research station/watershed		
8. Layout and Design of water harvesting structure.		

D) Reference Materials	
D1) Text Books for Reading	
1.	Principles of Agronomy BY S. R. Reddy
2.	Principles and practices of agronomy by p. Balasubramanium
3.	Organic farming Theory and Practice K. Annadurai
4.	Watershed Management J. V. S Murty
D2) Books for Reference	
1.	Cropping system in the tropics, principles and management by SP. Palaniappan and k. sivraman
2.	Introduction to farming system By Michael and Hanies (1982)
3.	Organic farming for sustainable agriculture By A. K. Dharna.
4.	Watershed Management By M. M. Das

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Student will know about farming system	
CO2	Students will be able to identify cropping scheme and patterns	
CO3	Students will gain Knowledge about rainfed agriculture	
CO4	Students will gain knowledge about watershed management practices	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

I) Question Paper Pattern (40 Marks)		
Q. No.	Nature / Type of Question	Marks
1.	Practical (Lab work)	25
2.	Submission Practical record book and project report	15
3.	Viva-voce	10
4.	Total Marks	50

|| शीलं परं भूषणम् ||

Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal, Kolhapur
Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur

Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**VI**
Course Code	**BV D62**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
(To be introduced from Academic Year 2023 – 24 onwards)
Subject to the revisions & modifications made from time to time

Mahavir Mahavidyalaya, Kolhapur (Autonomous)
Affiliated to Shivaji University, Kolhapur
(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture**		
Part	**III**	**Semester**	**VI**
Course	**Agriculture Economics & Extension**	**Course Code**	**BV D62 (Practical)**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**04**	**Contact Hours**	**06 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To study the determination of cost of cultivation
ii)	To study the working and management of banks.
iii)	To study the preparation of extension literature
iv)	To study the working and management of APMC.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Practical	CR	IH
1. Study the subject matter of agriculture economics	4	75
2. Analysis of progress and performance of commercial banks and RRBs		
3. Visit to a commercial bank and cooperative bank and cooperative society to acquire firsthand knowledge of their management, schemes and procedures		
4. Determination of cost of cultivation		
5. Get acquire knowledge of local market to study various marketing functions performed by different agencies		
6. Identification of marketing channels for selected commodities		
7. Visit to APMC		
8. Preparation of extension literature- leaflet, booklet, folder, pamphlet news storiesand success stories		
9. Get acquire knowledge of KVK and acquire knowledge of their management, schemes and crop production technologies.		
10. A visit to village to understand the problems being encountered by the villagers/farmers.		
11. Visit to Agricultural Department Government of Maharashtra.		

D) Reference Materials

D1) Text Books for Reading

1.	Introduction To Agricultural Economics by S. Singh (Author), V. Mehla (Author)
2.	Agricultural Economics by S. Subba Reddy
3.	Fundamentals of Agriculture Extension Education by Talukdar RK and Barman U
4.	Fundamentals of Agricultural Extension Education by Sagar Mondal, Kalyani Publishers

D2) Books for Reference	
1.	ICAR.2006. *Hand Book Of Agriculture*, ICAR, New Delhi.
2.	Handbook of Agricultural Economics by Christopher Barrett, David Just
3.	Principles of Agricultural Economics by David Colman and Trevor Young Department of Agricultural Economics, University of Manchester
4.	Handbook of Agricultural Extension by Saleem Ashraf Zakaria Yousaf Hassan Gulfam Hassan Amjad S. Gondal

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will get the knowledge about the determination of cost of cultivation.	
CO2	Students will understand the working and management of banks.	
CO3	Students will get the knowledge about the preparation of extension literature.	
CO4	Students will understand the working and management of APMC.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

I) Question Paper Pattern (40 Marks)		
Q. No.	Nature / Type of Question	Marks
1.	Practical (Lab work)	25
2.	Submission Practical record book and project report	15
3.	Viva - Voce	10
4.	Total Marks	50

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**VI**
Course Code	**BV D63**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies
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Mahavir Mahavidyalaya, Kolhapur (Autonomous)
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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture CBCS**		
Part	**III**	**Semester**	**VI**
Course	**Agriculture Engineering**	**Course Code**	**BV D63 (Practical)**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**04**	**Contact Hours**	**06/ Week**
Course Title	**--**		

B) Course Objectives:	
i)	To acquire knowledge of soil and water conservation
ii)	To learn the greenhouse technology
iii)	To provide knowledge the farm power and machineries
iv)	To Study of applications of seed drill and processing

C) Course Syllabi: (CR = Credits / IH: Instructional Hours)		
Practical	**CR**	**IH**
1. Problems and control measures of soil erosion.	**4**	**75**
2. Problems and control measures of water erosion.		
3. Design of different types of greenhouses.		
4. Different types of greenhouses accessories.		
5. Application of air cleaners and cooling system of engine.		
6. Study of sprayers and dusters		
7. Application of Dron Technology in agriculture.		
8. Application of primary and secondary tillage implements.		
9. Visit the greenhouse unit.		

D) Reference Materials	
D1) Text Books for Reading	
1.	A text book of Soil Science – Indian Society of Soil Science
2.	Greenhouse Technology – Arupratan Ghosh
3.	Textbook of Soil Science by T. Biswas, S. Mukherjee
4.	Concept of Soil Science book by S.G. Rajput
D2) Books for Reference	
1.	A text book of Soil Science – Indian Society of Soil Science
2.	Farm engine and Tractors by HE Gulvin (2001) McGraw hill.
3.	Fundamentals of Soil Science (8th edition) 1990 by Henry. D. Fothk.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Student will know about soil and water conservation	
CO2	Students will be able to identify greenhouse equipment	
CO3	Students will gain Knowledge about IC engine	
CO4	Students will gain knowledge about tillage implements	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

I) Question Paper Pattern (40 Marks)		
Q. No.	Nature / Type of Question	Marks
1.	Practical (Lab work)	25
2.	Submission Practical record book and project report	15
3.	Viva-voce	10
4.		
5.	Total Marks	50

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Syllabus for Choice Based Credit System (CBCS)
Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in Agriculture**
Part	**III**
Semester	**VI**
Course Code	**BV D64**
Course Name	**--**
Course Title	**--**
Paper No.	**--**

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A) Primary Information:			
Programme	**Bachelor of Vocation (B. Voc.) Agriculture**		
Part	**III**	**Semester**	**VI**
Course	**Spices, Condiments, Aromatic and Medicinal Plants**	**Course Code**	**BV D64 (Practical)**
Paper No.	**--**	**Course Type**	**Semester**
Total Marks	**50 Marks**	**Implementation**	**2023 – 24**
Total Credits	**04**	**Contact Hours**	**06 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To study the cultivation practices of medicinal, spices and aromatic crops.
ii)	To study the morphological characters of spices, medicinal and aromatic crops.
iii)	To study the fertilizer application methods in spices, medicinal and aromatic crops.
iv)	To study the seeds of medicinal, spices and aromatic plants.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Practical's	CR	IH
1. Identification of Spice crops.	4	75
2. Identification of Medicinal crops.		
3. Identification of Aromatic crops.		
4. Study of morphological characters of Spice crops		
5. Study of morphological characters of Medicinal crops.		
6. Study of morphological characters of Aromatic crops		
7. After care of Medicinal and aromatic crops		
8. After care of Spices and Condiments crops		
9. Visit to commercial Spices Cultivation.		
10.Visit to medicinal and Aromatic garden.		
11. Cultivation Practices.		

D) Reference Materials

D1) Text Books for Reading

1.	Handbook of Horticulture (2002) Chadha, K.L. ICAR, New Delhi
2.	Introduction to Spices Plantation Crops Medicinal and Aromatic Plants by N. Kumar
3.	Fundamentals of Horticulture 2014 Kausal Kumar Misra and Rajesh Kumar Biotech Books
4.	Bose, TK., Mitra, SK. and Sadhu, K. 1986.*Propagation of tropical and subtropical horticultural crops*. Naya Prokash, Calcutta.

D2) Books for Reference

1.	Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York
2.	Hartman, HT. and Kester, DE. 1986. Plant propagation - Principles and Pratices. Prentice - Hall, New Delhi
3.	Chadha, K.L. 2003. Handbook of Horticulture, ICAR, New Delhi. Choudhary, B. 1983.
4.	Vegetable National Trust, New Delhi.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline
ii)	Power point presentation
iii)	Group discussion
iv)	Field visit

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will know the cultivation practices of medicinal, spices and aromatic crops.	
CO2	Students will understand the morphological characters of spices, medicinal and aromatic crops.	
CO3	Students will get the knowledge about fertilizer application methods in spices, medicinal and aromatic crops	
CO4	Students will know the seeds of medicinal, spices and aromatic plants.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	Total Marks	50

I) Question Paper Pattern (40 Marks)		
Q. No.	Nature / Type of Question	Marks
1.	Practical	25
2.	Submission practical record book and project report	15
3.	Viva -voce	10
4.		
5.	Total Marks	50