

**MAHATMA GANDHI UNIVERSITY
UNDER GRADUATE VOCATIONAL
PROGRAMMES (HONOURS)
SYLLABUS**

**MGU-B.VOC. (Honours)
(2025 Admission Onwards)**



Faculty:Science

Expert Committee:Agriculture and Sustainability

Programme: B.Voc (Honours) Agriculture Technology

**Mahatma Gandhi University
Priyadarshini Hills
Kottayam – 686560, Kerala, India**

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MGU-B.VOC. (HONOURS)

Syllabus

PREFACE

The Board of studies (UG) Science ,Mahatma Gandhi university is extremely happy to introduce the revised curriculum of B. voc Degree Programme which will be applicable with effect from the academic year 2025-2026 onwards. The curriculum and syllabus have been prepared based on the MGU – UGP (Honours) structure leading to Honours Degree. This syllabus document is a harmonious fusion of numerous brilliant minds, tirelessly dedicating their unwavering efforts . With profound gratitude, the chairperson and the members of the Board of Studies express their sincere appreciation to all those who have contributed to this noble and commendable venture.

We extend our profound gratitude to the esteemed Vice Chancellor, Members of the Syndicate of MG University, the Registrar and the diligent sub- committee members entrusted with the implementation of UGP (Honours) Programme in the University. Their goal – oriented management style ,unwavering follow -up, ceaseless inspiration and receptive nature have been instrumental in the process.

We are deeply thankful to the administrative staff of the MG University for their support from the very beginning of this task. Principals of all Arts and Science colleges affiliated to MG University deserve a special mention for having positively responded to our invitation to ensure participation in the workshop.

With genuine optimism , we ardently hope that the meticulously designed syllabus will indeed prove to be highly beneficial for the leaners, empowering then with comprehensive knowledge and essential skills. This enriching experience will undoubtedly aid them in shaping their future with confidence and competence

We extend our heartfelt gratitude to everyone who played a significant role in the syllabus drafting process.

With Warm Regards,

Chairman

Board of Studies of Science

(UG)

Expert Committee & External Experts

1	Dr. Jolly V. Antony (Convener)	Professor of Chemistry	Maharaja's College, Ernakulam
2	Dr. N. Suja Assistant	Professor of Aquaculture	St. Aloysius College, Edathua
3	Dr. Pratheesh Mathew	Assistant Professor of Zoology	St. Thomas College, Palai, Arunapuram P.O
4	Dr. Sreejaya R.	Assistant Professor of Zoology	St. Thomas College, Ranni
5	Renu Mathew	B.Voc Nodal Officer	St. Dominic's College, Kanjirappally
6	Shony G Kizhakkethottam	B.Voc Nodal Officer	St. George's College, Aruvithura
7	Sherin Mary Simon	Assistant Professor (B.Vo	St. Theresa's College, Ernakulam
8	Deena Paul	Assistant Professor of Chemistry	St. Joseph's College, Moolamattam
9	Dr. Ajalesh B. Nair	Assistant Professor of Chemistry	UC College, Aluva
10	Dr. Deepthi A.S.	Associate Professor of Botany	Catholicate College, Pathanamthitta

Syllabus Index

Name of the Major Subject: Agriculture Technology

Semester: 1

Course Code	Title of the Course	Type of the Course	Credit	Hours/week	Hour Distribution /week		
					L	P	O
MG1SDCB AT100	FUNDAMENTALS OF HORTICULTURE AND NURSERY MANAGEMENT	SDC	4	5	3	2	0
MG1SDCB AT101	FUNDAMENTALS OF AGRONOMY	SDC	4	4	4	0	0
MG1SDCB AT102	PRINCIPLES OF LANDSCAPE DESIGNING	SDC	4	5	3	2	0
MG1MDC BAT100	INDOOR AND OUTDOOR GARDENING	MDC	3	3	3	0	0
MG1SDCB AT103	ON THE JOB TRAINING	SDC	2	5	0	0	5

L — Lecture, P — Practical/Practicum , O — On the Job Training

Semester: 2

Course Code	Title of the Course	Type of the Course	Credit	Hours/week	Hour Distribution /week		
					L	P	O
MG2SDCB AT100	PROTECTED CULTIVATION OF HORTICULTURAL CROPS	SDC	4	4	3	2	0
MG2SDCB AT101	FUNDAMENTALS OF CROP PROTECTION	SDC	4	5	4	0	0
MG2SDCB AT102	FUNDAMENTALS OF SOIL SCIENCE	SDC	4	4	3	2	0
MG2MDC BAT100	PLANT PROPAGATION METHODS	MDC	3	4	2	2	0
MG2SDCB AT103	ON THE JOB TRAINING	SDC	2	5	0	0	5

L — Lecture, P — Practical/Practicum , O — On the Job Training

Semester: 3

Course Code	Title of the Course	Type of the Course	Credit	Hours/week	Hour Distribution /week		
					L	P	O
MG3SDCB AT200	PLANTATION CROPS, SPICES AND FRUITS	SDC	4	4	4	0	0
MG3SDCB AT201	INTEGRATED PEST MANAGEMENT OF CROPS	SDC	4	5	3	2	0
MG3SDCB AT202	FUNDAMENTALS OF ORGANIC FARMING	SDC	4	5	3	2	0
MG3MDC BAT200	INTEGRATED FARMING AND HOMESTEAD FARMING IN KERALA	MDC	3	3	3	0	0
MG3SDCB AT203	ON THE JOB TRAINING	SDC	2	5	0	0	5
MG3MPC BAT200	FUNDAMENTALS OF ORGANIC FARMING	MPC	4	5	3	2	0

L — Lecture, P — Practical/Practicum , O — On the Job Training

Semester: 4

Course Code	Title of the Course	Type of the Course	Credit	Hours/week	Hour Distribution /week		
					L	P	O
MG4SDCB AT200	LIVESTOCK FARMING	SDC	4	4	4	0	0
MG4SDCB AT201	COMMERCIAL VEGETABLE PRODUCTION	SDC	4	5	3	2	0
MG4SDCB AT202	FARM POWER AND MACHINERY	SDC	4	5	3	2	0
MG4SECB AT200	FUNDAMENTALS OF AGRICULTURAL ENGINEERING	SEC	3	3	3	0	0
MG4VAC BAT200	ENVIRONMENTAL STUDIES	VAC	3	3	3	0	0
MG4INTB AT200	SUMMER INTERNSHIP	INT	2				
MG4MPC BAT200	COMMERCIAL VEGETABLE PRODUCTION	MPC	4	5	3	2	0

L — Lecture, P — Practical/Practicum , O — On the Job Training

Semester: 5

Course Code	Title of the Course	Type of the Course	Credit	Hours/week	Hour Distribution /week		
					L	P	O
MG5SDCB AT300	INFORMATION TECHNOLOGY AND NETWORKING FOR AGRICULTURE	SDC	4	4	4	0	0
MG5SDEB AT300	TISSUE CULTURE AND CROP IMPROVEMENT	SDCE	4	5	3	2	0
MG5SDEB AT301	WEATHER FORECASTING AND CLIMATE CHANGE	SDCE	4	5	3	2	0
MG5SDCB AT301	PRINCIPLES OF AGRIBUSINESS MANAGEMENT	SDC	4	5	3	2	0
MG5SECB AT300	COMMERCIAL ENTERPRISES	SEC	3	4	2	2	0
MG5VAC BAT300	AGRICULTURE WASTE MANAGEMENT	VAC	3	3	3	0	0
MG5MPC BAT300	PRINCIPLES OF AGRIBUSINESS MANAGEMENT	MPC	4	4	4	0	0

L — Lecture, P — Practical/Practicum , O — On the Job Training

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Semester: 6

Course Code	Title of the Course	Type of the Course	Credit	Hours/week	Hour Distribution /week		
					L	P	O
MG6SDEB AT300	COMMUNICATION AND AGRICULTURAL EXTENSION SYSTEM	SDCE	4	5	3	2	0
MG6SDEB AT301	FARMING SYSTEM APPROACH FOR SUSTAINABLE CROP	SDCE	4	5	3	2	0

	PRODUCTION						
MG6SDCB AT300	DISEASE MANAGEMENT IN COMMERCIAL CROPS	SDC	4	5	3	2	0
MG6SECB AT300	ENTREPRENEURSHIP DEVELOPMENT	SEC	3	3	3	0	0
MG6VAC BAT300	HI TECH AGRICULTURE IoT AND DRONES	VAC	3	3	3	0	0
MG6PRJB AT300	PROJECT	PROJECT	4	8	0	8	0
MG6MPC BAT300	ENTREPRENEURSHIP DEVELOPMENT	MPC	4	4	4	0	0

L — Lecture, P — Practical/Practicum , O — On the Job Training

Semester 7& 8

Course Code	Title of the Course	Type of the Course	Credit	Hours/week	Hour Distribution /week		
					L	P	O
MG7APPBAT400	Apprenticeship	Apprenticeship	28	280 days	0	28	0
MG7RINBAT400	Research Internship	Internship	20	200 days	0	20	0

B.Voc Honours

Course Code	course	Methodology	Number of days	Credits	Hour Distribution		
					L	P	O

MG8AP PBAT40 0	APP	Apprentice ship	280	28	0	0	28
NA	MPC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-

B.Voc Honours with Research							
Course Code	course	Methodology	Number of days	Credits	Hour Distribution		
					L	P	O
MG8RI NBAT40 0	RIN	Research Internship	20	20	0	0	20
NA	SDC	Online	NA	4	-	-	-
NA	SDC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-

Job Roles and Qualification Packs for Certificate, Diploma, Bachelor's, and Honours Degrees.

JOB ROLES	NHEQF LEVEL	QPs ALIGNED	SECTOR SKILL
Professional in Gardening and Nursery Management	4.5	AGR/Q0815	ASCI
Organic Farm and Business Promoter	5	AGR/Q1210	ASCI
Digital Agriculture Extension Promoter	5.5	AGR/Q1010	ASCI



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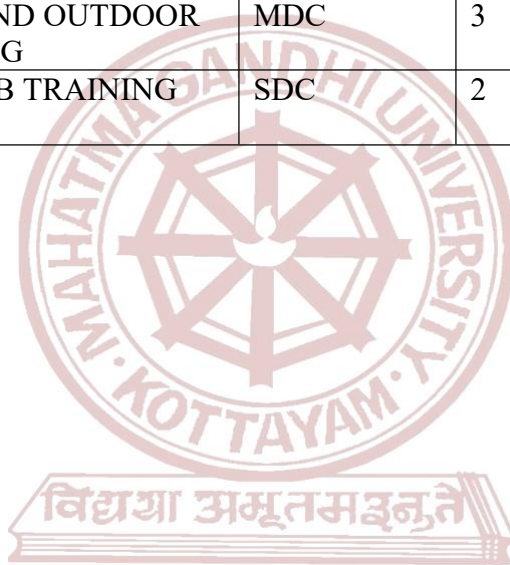
SEMESTER 1

MGU-B.VOC. (HONOURS)

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SEMESTER 1

Course Code	Title of the Course	Type of the Course	Credit	Hours/week	Hour Distribution /week		
					L	P	O
MG1SDCB AT100	FUNDAMENTALS OF HORTICULTURE AND NURSERY MANAGEMENT	SDC	4	5	3	2	0
MG1SDCB AT101	FUNDAMENTALS OF AGRONOMY	SDC	4	5	4	0	0
MG1SDCB AT102	PRINCIPLES OF LANDSCAPE DESIGNING	SDC	4	5	3	2	0
MG1MDC BAT100	INDOOR AND OUTDOOR GARDENING	MDC	3	3	3	0	0
MG1SDCB AT103	ON THE JOB TRAINING	SDC	2	5	0	0	5



MGU-B.VOC. (HONOURS)

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**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science			
Programme	B.Voc Agriculture Technology (Honours)			
Course Name	FUNDAMENTALS OF HORTICULTURE AND NURSERY MANAGEMENT			
Type of Course	SDC			
Course Code	MG1SDCBAT100			
Course Level	100-199			
Course Summary	This course provides information about the importance, division and classification of horticultural crops. It also helps to understand the basic principles and types of plant Propagation.			
Semester	1	Credits		Total Hours
Course Details	Learning Approach	Lecture	Practical	
		3	1	
		OJT	0	75
Pre-requisites, if any	Nil			

CO-PO ARTICULATION MATRIX

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
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1	Show the importance of horticulture in India , Kerala and division and classification of horticultural crops and also the management practices in crops.	K	2,4,6,9,10
2	Compare the knowledge of training and pruning in horticultural crops .	U	1,2,4,5,6,8,9,10
3	Demonstrate skill in orchard planning its layout and propagation methods in plants.	U	1,2,3,4,5,6,8,9,10
4	Develop interest in nursery management.	A	1,2,4,6,8,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	1	0	1	0	2	0	0	1	3
CO 2	3	2	0	2	3	1	0	1	1	2
CO 3	2	1	1	1	2	1	0	1	1	3
CO 4	3	2	0	1	0	2	0	2	2	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

MGU-B.VOC. (HONOURS)

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs.	CO No.
1	Introduction to Horticulture		14	
	1.1	Horticulture - definition, importance.	2	1
	1.2	Division and classification of horticultural /crops.	3	1
	1.3	Importance of horticulture in India and Kerala.	2	1
	1.4	Orchard planning, layout, planting systems - management practices.	3	1

	1.5	Training and pruning in horticultural crops.	4	1
2	Management Practices in Horticultural Crops and Nursery Management		17	
	2.1	Different management practices in horticultural crops - mulching, water management, soil-fertility management, weed management, nutrition, management of pest and disease, maturity.	4	2
	2.2	Harvesting and post-harvest handling of horticultural produce.	4	2
	2.3	Nursery -site selection, layout, Components of a nursery.	3	2
	2.4	Plant propagating structures-.greenhouse, glasshouse, hot bed, cold frame, lath house, net house, mist, Chamber, nursery management practices, Ornamental horticultural nursery.	6	2
3	Propagation Methods		14	
	3.1	Plant propagation - definition and basic concepts.	3	3
	3.2	Sexual and asexual types - advantages and disadvantages.	5	3
	3.3	Media, containers, potting, re potting and pre planting treatments.	2	3
	3.4	Asexual propagation - propagation by cuttings, layering, budding, Grafting, tissue culture.	4	3

	Practical		30	
	4.1	Propagation by Layering	5	4
	4.2	Propagation by Budding	5	4
	4.3	Propagation by Grafting	5	4
	4.4	Propagation by cutting	5	4
	4.5	Propagation Structures	10	4
5	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Both Theory and Practical
	A. Continuous Comprehensive Assessment (CCA) Theory Total Marks:25 Assessment Methods :Oral presentation,Written test,Assignment,In class discussion.
	Practical Total Marks :15

	<p>Assessment Methods: Viva ,Practical, Assignment</p>
	<p align="center">B. End Semester Evaluation (ESE)</p> <p>Theory</p> <p>Total Marks : 50</p> <p>Assessment Methods :Written Exam</p> <p>Duration of Examination :1.50 hr.</p> <p>Pattern of examination for Theory :Non-MCQ</p> <p>Different parts of written examination :Part A, Part B, Part C</p> <p>Answer Type : Short answer, Short Essays, Essays</p> <p>Marks for part :2, 5, 15</p> <p>Number of questions in each part: 7,7,2</p> <p>Number of questions to be answered :5,5,1</p> <p>Marks for parts:</p> <p align="center">Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p align="center">Part B-Short Essay-(5out of 7)-(5*5=25)</p> <p align="center">Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical</p> <p>Total Marks :35</p> <p>Assessment Methods :Exam-25</p> <p align="center">Record-5</p> <p align="center">Viva-5</p> <p>Duration of Examination :1 hr.</p>

References

1. Singh, J. (2015). Fundamentals of horticulture. Kalyani Publishers.
2. Kumar, N. (2006). Introduction to horticulture. Oxford & IBH Publishing.

3. Singh, J. (2017). Basic horticulture (2nd ed.). Kalyani Publishers.
4. Bose, T. K., Mitra, S. K., & Sanyal, D. (2002). Fruits: Tropical and subtropical (Vol. 1–3). Naya Udyog.
5. Thamburaj, S., & Singh, N. (2004). Vegetables, tuber crops and spices. ICAR Publication.
6. Sharma, R. R. (2006). Propagation of horticultural crops. Kalyani Publishers.
7. Srivastava, R. P., & Kumar, S. (2002). Fruits and vegetable preservation: Principles and practices (3rd ed.). International Book Distributing Co.
8. Chadha, K. L. (Ed.). (2009). Handbook of horticulture (2nd ed.). Indian Council of Agricultural Research (ICAR).

Suggested Readings

1. Bird, C. (Ed.). (2014). The fundamentals of horticulture: Theory and practice. Cambridge University Press.
2. Singh, J. (2018). Fundamentals of horticulture (1st ed.). Kalyani Publishers.
3. Hartmann, H. T., Kester, D. E., Davies, F. T., & Geneve, R. L. (2010). Plant propagation: Principles and practices (8th ed.). Prentice Hall.
4. Janick, J. (2011). Horticultural science (4th ed.). W.H. Freeman and Company.
5. Dirr, M. A. (1998). Manual of woody landscape plants: Their identification, ornamental characteristics, culture, propagation, and uses. Stipes Publishing Co.



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science			
Programme	B. Voc Agriculture Technology (Honours)			
Course Name	FUNDAMENTALS OF AGRONOMY			
Type of Course	SDC			
Course Code	MG1SDCBAT101			
Course Level	100-199			
Course Summary	This course helps students to understand agronomic classification of crops, major farming systems in Kerala and Cropping Intensity and methods of sowing/planting.			
Semester	1	Credits		4
Course Details	Learning Approach	Lecture	Practical	OJT
		4	0	0
		Total Hours		60
Pre- requisites, if any	Nil			

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Define the fundamentals of agronomy, fertility of soil and plant nutrition and importance of agriculture and field management of crops	K	2,4,6,10
2	Illustrate the knowledge of fertilizer calculation in the field.	U	1,2,3,4,5, 6,8,10

3	Identify the best cultural practices	U	1,2,6,9,10
4	Choose the best sowing and irrigation methods.	A	1,2,4,6,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	2	0	1	0	1	0	0	0	1
CO 2	2	2	2	1	1	1	0	1	0	2
CO 3	3	2	0	0	0	2	0	0	1	3
CO 4	2	2	0	3	0	2	0	0	1	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs.	CO No.
1	Introduction to Agriculture		12	
	1.1	Importance of agriculture in India and Kerala.	2	1
	1.2	Importance of food security.	3	1
	1.3	Divisions of Agriculture, Sustainable agriculture, Subsistence agriculture, commercial agriculture, Extensive and intensive agriculture, Urban agriculture, Agribusiness.	7	1
2	Major Farming Systems		17	
	2.1	Agronomic classification of crops.	5	2
	2.2	Major farming systems in Kerala and Cropping Intensity.	7	2
	2.3	Methods of sowing/planting - planting	5	2

		geometry.		
3	Soil Fertility		18	
	3.1	Soil productivity and fertility.	3	3
	3.2	Crop nutrition - nutrients - classification - Nutrient sources-organic manures - fertilizers - bio fertilizers.	7	3
	3.3	Green manure crops and cover crops.	4	3
	3.4	Integrated Nutrient Management. Fertilizer calculation.	4	3
4	Water Management		13	
	4.1	Irrigation: definition and objectives.	5	4
	4.2	Role of water in soil and plants-- drip and sprinkle irrigation systems.	8	4
5	Teacher Specific			

MGU-B.VOC. (HONOURS)

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Theory

	<p>A. Continuous Comprehensive Assessment (CCA)</p> <p>Theory Total Marks :30 Assessment Methods : Oral presentation, Written test, Assignment, In class discussion</p>
	<p>B. End Semester Evaluation (ESE)</p> <p>Theory Total Marks :70 Assessment Methods : Written exam Duration of Examination: 2 hr. Pattern of examination for Theory: Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, short essay, essay Marks for part :2,5,15 Number of questions in each part :12,6,4 Number of questions to be answered :10,4,2 Marks for parts: Part A-Short Answer-(10 out of 12)-(10*2=20) Part B-Short Essay-(4 out of 6)-(4*5=20) Part C-Essay-(2 out of 4)-(2*15=30)</p> <p style="text-align: center;">Syllabus</p>

References

1. Balasubramanian, P., & Palaniappan, S. P. (2001). *Principles and practices of agronomy*. AgroBios (India) Ltd.
2. Cox, G. W., & Atkins, M. D. (1979). *Agricultural ecology: An analysis of world food production systems*. W. H. Freeman and Company.
3. De, G. C. (1989). *Fundamentals of agronomy*. Oxford & IBH Publishing Co.
4. Grigg, D. B. (1974). *The agricultural systems of the world: An evolutionary approach*. Cambridge University Press.
5. Harlan, J. R. (1992). *Crops and man*. American Society of Agronomy & Crop Science Society of America.

6. Havlin, J. L., Beaton, J. D., Tisdale, S. L., & Nelson, W. L. (2006). *Soil fertility and fertilizers: An introduction to nutrient management* (7th ed.). Pearson Education.
7. Indian Council of Agricultural Research (ICAR). (2006). *Handbook of agriculture*. ICAR.
8. Janick, J., Schery, R. W., Woods, F. W., & Ruttan, V. W. (1974). *Plant science: An introduction to world crops*. W. H. Freeman and Company.
9. Noor Mohammed. (1992). Origin, diffusion and development of agriculture. In N. Mohammed (Ed.), *New dimensions in agricultural geography: Vol. 1. Historical dimensions of agriculture* (pp. 29–75). Concept Publishing Co.
10. Reddy, T. Y., & Reddy, G. H. S. (1995). *Principles of agronomy*. Kalyani Publishers.
11. Chatterjee, B. N., & Maiti, S. (1985). *Principles and practices of rice growing*. Oxford & IBH Publishing Co.

Suggested Readings

1. Brady, N. C., & Weil, R. R. (2016). *The nature and properties of soils* (15th ed.). Pearson.
2. Tisdale, S. L., Nelson, W. L., Beaton, J. D., & Havlin, J. L. (2002). *Soil fertility and fertilizers: An introduction to nutrient management* (6th ed.). Prentice Hall.
3. Havlin, J. L., Beaton, J. D., Tisdale, S. L., & Nelson, W. L. (2013). *Soil fertility and fertilizers* (8th ed.). Pearson Education.
4. Vanderlip, R. L. (1993). *Plant growth and development: A molecular approach*. Academic Press.
5. Fageria, N. K. (2014). *Nitrogen management in crop production*. CRC Press.



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Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science			
Programme	B.Voc Agriculture Technology(Honours)			
Course Name	PRINCIPLES OF LANDSCAPE DESIGNING			
Type of Course	SDC			
Course Code	MG1SDCBAT102			
Course Level	100-199			
Course Summary	This course provides awareness on designing and laying out of a landscape ,different types and features of garden and its maintenance.			
Semester	1	Credits	4	
Course Details	Learning Approach	Lecture	Practical	Total Hours
		3	1	
Pre- requisites, if any	Nil			

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
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1	Choose the design and principles of landscape, garden tools, garden structures and garden types.	K	1,3,4
2	Explain various methods of irrigation in the field, application of fertilizers to garden plants and maintenance of lawn, Establishment of garden.	U	1,3,7,10
3	Identify the features of different types of gardens.	A	4,6,8,10
4	Discover skill in landscape designing	A	1,4,5,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	1	2	0	0	0	0	0	0
CO 2	3	0	2	0	0	0	1	0	0	2
CO 3	0	0	0	2	0	2	0	1	0	2
CO 4	1	0	0	2	2	0	0	0	0	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

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Content for Classroom transaction (Units)

Module	Units	Course description	Hrs.	CO No.
	Principles of Landscape Designs		12	
1	1.1	Principles and elements of landscape designs.	2	1

	1.2	Garden elements and designs propagation of ornamental plants.	4	1
	1.3	Graphics and symbols in landscape gardening.	3	1
	1.4	Tools and implements used in land scape design.	3	1
	Management Practice of Landscape		8	
2	2.1	Care and Maintenance of plants in landscape:	2	2
	2.2	Planting and maintenance of plants in the landscape	2	2
	2.3	Methods of irrigation	2	2
	2.4	Methods of application of fertilizers to garden plants.	2	2
	Types and Layout of gardens		25	
3	3.1	Layout of different styles of gardens .	5	3
	3.2	Layout of formal and informal types of gardens Establishment and maintenance of lawn	5	3
	3.3	Indoor gardening: Selection of indoor plants.	2	3
	3.4	Layout of special types of gardens - rock gardens . gravel garden , roof gardening paved garden marsh or bog garden Landscaping of places of public importance , gardening of public places	8	3

	3.5	Models for interior plant scaping - vertical garden, miniature garden and terrariums. Bonsai	5	3
4	Practical		30	
	4.1	Setting up of a miniature garden	9	4
	4.2	Preparation of Bonsai and Terrarium	8	4
	4.3	Setting up of a vertical garden	9	4
	4.4	Maintenance of lawn	4	4
5	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
	MODE OF ASSESSMENT : Both
Assessment Types	C. Continuous Comprehensive Assessment (CCA) Theory Total Marks:25 Assessment Methods : Oral presentation,Written test,Assignment,In class discussion.

	<p>Practical</p> <p>Total Marks :15</p> <p>Assessment Methods: Viva ,Practical, Assignment</p> <p>D. Continuous Comprehensive Assessment (CCA)</p>
	<p>E. End Semester Evaluation (ESE)</p> <p>Theory</p> <p>Total Marks : 50</p> <p>Assessment Methods :Written Exam</p> <p>Duration of Examination :1.50 hr.</p> <p>Pattern of examination for Theory :Non-MCQ</p> <p>Different parts of written examination :Part A, Part B, Part C</p> <p>Answer Type : Short answer, Short Essays, Essays</p> <p>Marks for part :2, 5, 15</p> <p>Number of questions in each part: 7,7,2</p> <p>Number of questions to be answered :5,5,1</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p>Part B-Short Essay-(5out of 7)-(5*5=25)</p> <p>Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical</p> <p>Total Marks :35</p> <p>Assessment Methods :Exam-25</p> <p style="padding-left: 100px;">Record-5</p> <p style="padding-left: 100px;">Viva-5</p> <p>Duration of Examination :1 hr.</p>

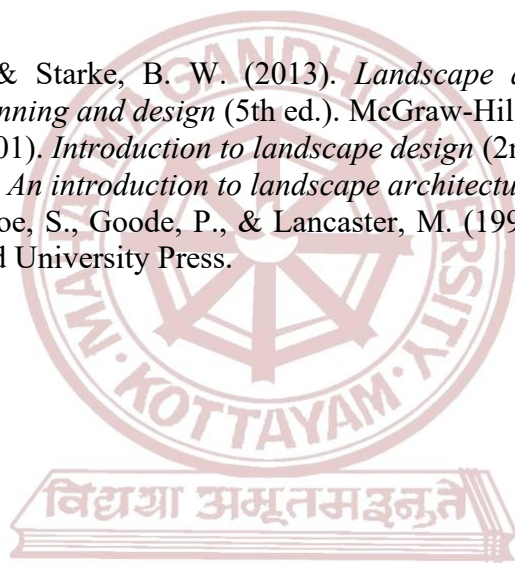
References

1. Edmond, J. B., Sen, T. D., Andrews, T. S., & Halfacre, R. G. (1977). *Fundamentals of horticulture*. Tata McGraw-Hill.
2. Janick, J. (1963). *Horticultural science*. W. H. Freeman.

3. Kumar, N. (1990). *Introduction to horticulture*. Rajalakshmi Publications.
4. Carpenter, P. L., Walker, T. D., & Lanphear, F. O. (1975). *Plants in the landscape*. W. H. Freeman and Company.
5. Desai, B. L. (1979). *Planning and planting of home gardens*. Indian Council of Agricultural Research (ICAR).
6. Joiner, J. N. (1981). *Foliage plant production*. Prentice Hall.
7. Nambisan, K. M. P. (1991). *Design elements of landscape gardening*. Oxford & IBH Publishing Co.
8. Swarup, V. (1993). *Indoor gardening*. Indian Council of Agricultural Research (ICAR).
9. Trivedi, P. P. (1983). *Home gardening*. Indian Council of Agricultural Research (ICAR).

Suggested Readings

1. Simonds, J. O., & Starke, B. W. (2013). *Landscape architecture: A manual of environmental planning and design* (5th ed.). McGraw-Hill Education.
2. Motloch, J. L. (2001). *Introduction to landscape design* (2nd ed.). Wiley.
3. Laurie, M. (1986). *An introduction to landscape architecture* (2nd ed.). Elsevier.
4. Jellicoe, G., Jellicoe, S., Goode, P., & Lancaster, M. (1995). *The Oxford companion to gardens*. Oxford University Press.



MGU-B.VOC. (HONOURS)

Syllabus



Mahatma Gandhi University Kottayam

Faculty/Discipline	Science			
Programme	B.Voc Agriculture Technology (Honours)			
Course Name	INDOOR AND OUTDOOR GARDENING			
Type of Course	MDC			
Course Code	MG1MDCBAT100			
Course Level	100-199			
Course Summary	It describes about the different methods of indoor gardening and outdoor gardening . It also focus to develop skill in the setting up of an indoor and outdoor garden.			
Semester	1	Credits		3
Course Details	Learning Approach	Lecture	Practical	OJT
		3	0	0
				Total Hours
				45
Pre-requisites, if any	Nil			

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Define the concepts such as indoor and outdoor gardens and its maintenance and benefits.	K	1,2,4,6,9,10
2	Demonstrate the knowledge of indoor plants in constructing indoor gardens.	U	1,2,3,4,5,6,8,9,10

3	Develop skill in creating outdoor Garden	A	1,2,4,8,9,10
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CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	1	0	2	0	1	0	0	1	2
CO 2	2	2	1	2	1	2	0	1	1	2
CO 3	3	2	0	1	0	0	0	1	1	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs.	CO No.
1	Introduction to Gardening		12	
	1.1	Definition importance scope .	2	1
	1.2	Overview of indoor and outdoor gardening.	3	1
	1.3	Benefits of gardening for physical and mental well being.	3	1
	1.4	Basic gardening terminology and concepts.	4	1
2	Indoor Gardening		16	
	2.1	Types of indoor gardens hydroponic, aeroponic, container gardening.	5	2
	2.2	Choosing the right plants for indoor gardens low-light, air-purifying.	3	2
	2.3	Indoor gardening techniques propagation, pruning.	4	2
	2.4	Managing indoor garden pests and disease.	4	2

3	Garden Principles		17	
	3.1	Types of outdoor gardens.	6	3
	3.2	Garden design principles.	3	3
	3.3	Soil preparation and management for outdoor gardens.	4	3
	3.4	Outdoor gardening techniques (e.g., composting).	4	3
4	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Theory
	C. Continuous Comprehensive Assessment (CCA) Theory Total Marks :25 Mode of Assessment :Oral presentation, Written test.Assignment,In class discussion
	D. End Semester Evaluation (ESE) Theory Total Marks: 50 Assessment Methods :Written Exam Duration of Examination :1.50 hr.

	<p>Pattern of examination for Theory :Non-MCQ</p> <p>Different parts of written examination Part A, Part B, Part C</p> <p>Answer Type : Short answer, Short Essays, Essays</p> <p>Marks for part :2, 5, 15</p> <p>Number of questions in each part 7,7,2</p> <p>Number of questions to be answered :5,5,1</p> <p>Marks for parts:</p> <p style="padding-left: 40px;">Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p style="padding-left: 40px;">Part B-Short Essay-(5out of 7)-(5*5=25)</p> <p style="padding-left: 40px;">Part C-Essay-(1 out of 2)-(1*15=15)</p>
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References

1. Bubel, N. (1988). *The new seed-starter's handbook*. Rodale Books.
2. Smith, E. C. (2000). *The vegetable gardener's bible*. Storey Publishing.
3. Hill, L. (1987). *The indoor garden book*. Storey Communications.

Suggested Readings

1. Hessayon, D. G. (2001). *The house plant expert*. Expert Books.
2. Bradley, F. M., Ellis, B. W., & Martin, D. M. (2007). *The organic gardener's handbook of natural pest and disease control*. Rodale Books.
3. McHoy, P. (2005). *The indoor gardener: Creative displays for every home*. Lorenz Books.
4. Bender, S. F., & Smith, B. A. (2004). *The Southern living garden book* (Revised ed.). Oxmoor House.

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	ON THE JOB TRAINING				
Type of Course	SDC				
Course Code	MG1SDCBAT103				
Course Summary	<p>On-the-Job Training (OJT) is designed to equip students with practical skills, workplace discipline, and industry exposure by actively engaging them in real-world professional environments. Conducted in collaboration with firms, industries, research institutions, or higher education establishments, OJT enables students to understand industry standards, apply academic knowledge, and perform job-specific tasks using contemporary tools and practices. The training must be undertaken in the student's own skill domain, aligned with the major area of study in their undergraduate program, to ensure relevance and coherence with their academic and career goals. The program also fosters essential workplace competencies such as communication, responsibility, adaptability, and teamwork. Furthermore, it offers students a platform for career exploration and networking, helping them evaluate potential career paths and align their aspirations with industry demands.</p>				
Semester	1	Duration	5 hours/week	Credits	2

COURSE OUTCOMES (CO)

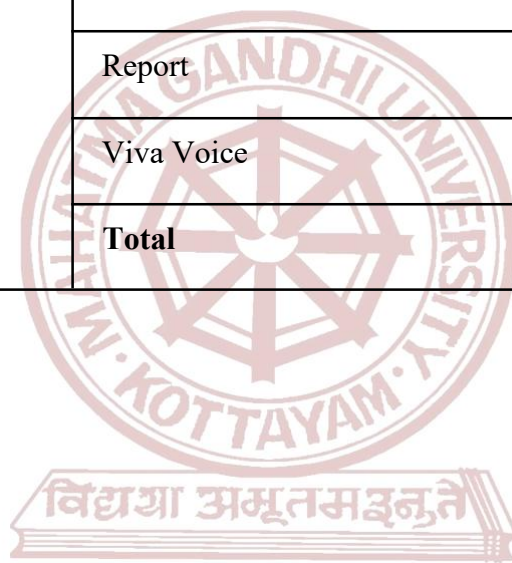
CO No:	Expected Course Outcome	Learning Domains	PO No:
	Upon the successful completion of the course, the student will be able to		
1	Demonstrate the ability to integrate classroom learning with real-world agricultural practices.	Ap	1,3,6,10
2	Apply techniques in crop production, animal husbandry, pest management, soil and water conservation, and sustainable farming.	S	2,4,5,10
3	Integrate academic knowledge with practical applications through internship	An	1,2,3,6,10
4	Identify and evaluate potential career opportunities by reflecting on their internship experiences and professional interactions.	E	1,9,10
<p><i>*Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)</i></p>			

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	1	0	0	3	0	0	0	2
CO 2	0	1	0	2	3	0	0	0	0	1
CO 3	1	1	1	0	0	3	0	0	0	3
CO 4	1	0	0	0	2	0	0	0	1	3

Assessment Types	MODE OF ASSESSMENT				
	A	Internal Evaluation			
		<table border="1" style="width: 100%;"> <thead> <tr> <th>Components</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Components	Marks	
Components	Marks				

		Feedback from the hosting organization	5
		Internal Supervisor feedback	10
		Total	15
	B	External Evaluation	
		Components	Marks
		Presentation	10
		Report	10
		Viva Voice	15
		Total	35



MGU-B.VOC. (HONOURS)

Syllabus



SEMESTER 2

MGU-B.VOC. (HONOURS)

Syllabus

Course Code	Title of the Course	Type of the Course	Credit	Hours/ week	Hour Distribution /week		
					L	P	O
MG2SDCB AT100	PROTECTED CULTIVATION OF HORTICULTURAL CROPS	SDC	4	4	3	2	0
MG2SDCB AT101	FUNDAMENTALS OF CROP PROTECTION	SDC	4	5	4	0	0
MG2SDCB AT102	FUNDAMENTALS OF SOIL SCIENCE	SDC	4	4	3	2	0
MG2MDC BAT100	PLANT PROPAGATION METHODS	MDC	3	4	2	2	0
MG2SDCB AT103	ON THE JOB TRAINING	SDC	2	5	0	0	5



MGU-B.VOC. (HONOURS)

Syllabus



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	PROTECTED CULTIVATION OF HORTICULTURAL CROPS				
Type of Course	SDC				
Course Code	MG2SDCBAT100				
Course Level	100-199				
Course Summary	This course helps to familiarize with protected cultivation structures its scope and importance in India , Kerala and also the problem management in greenhouse structures.				
Semester	2	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	1		
Pre- requisites, if any	Nil				

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
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1	List the protected structures used in the cultivation of horticultural crops.	K	4,6,7,9,10
2	Explain the knowledge of cooling and heating systems in the maintenance of green house.	U	1,2,4,6,10
3	Plan the water and nutrient management in green house.	A	1,3,4,6,8,10
4	Discover skills in special horticultural practices.	An	1,2,4,6,7,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	0	0	3	0	2	1	0	2	2
CO 2	1	2	0	2	0	0	0	0	0	3
CO 3	1	0	2	2	0	2	0	3	0	3
CO 4	2	1	0	2	0	1	1	0	0	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Syllabus

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Growing Structures Utilized in Protected Cultivation		15	
	1.1	Introduction - scope and importance	4	1
	1.2	Problems and prospects of protected culture in India	3	1
	1.3	Growing structures - green	3	1

		house - polyhouse - net house		
	1.4	Basic considerations in establishment and operation of greenhouses - maintenance.	5	1
	Greenhouse - Functioning and Maintenance.		15	
2	2.1	Advantages of growing plants in a greenhouse - functioning and maintenance.	3	2
	2.2	Manipulation of environmental factors - environmental control systems in green house.	6	2
	2.3	Maintenance of cooling and heating system in green houses.	6	2
	Horticultural Practices in Protected Cultivation		15	
3	3.1	Type of containers used in protected culture.	2	3
	3.2	Substrate -Use of substrate and preparation of substrate for protected cultivation,	3	3
	3.3	Soil decontamination. Water management - nutrient management (fertigation).	3	3
	3.4	Crop regulation - special horticultural practices in protected cultivation for commercially .	3	3
	3.5	Pot tray seedling preparation Tissue culture banana hardening Important crops: vegetable crops, flowering plants, seedlings, etc.	4	3

4	Practical		30	
	4.1	Study of structures utilized for protected culture.	10	4
	4.2	Study of various inputs used for protected structure	8	4
	4.3	Protected cultivation of Cowpea, Capsicum, Cucumber and tomato.	12	4
5	Teacher Specific			

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	0	0	3	0	2	1	0	2	2
CO 2	1	2	0	2	0	0	0	0	0	3
CO 3	1	0	2	2	0	2	0	3	0	3
CO 4	2	1	0	2	0	1	1	0	0	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

MGU-B.VOC. (HONOURS)

COURSE CONTENT

Content for Classroom transaction (Units)

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminar Discussion
Assessment Types	MODE OF ASSESSMENT Both

F. Continuous Comprehensive Assessment (CCA)

Theory

Total Marks:25

Assessment Methods :Oral presentation,Written test,Assignment,In class discussion.

Practical

Total Marks :15

Assessment Methods: Viva ,Practical, Assignment

G. Continuous Comprehensive Assessment (CCA)

H. End Semester Evaluation (ESE)

Theory

Total Marks : 50

Assessment Methods :Written Exam

Duration of Examination :1.50 hr.

Pattern of examination for Theory :Non-MCQ

Different parts of written examination :Part A, Part B, Part C

Answer Type : Short answer, Short Essays, Essays

Marks for part :2, 5, 15

Number of questions in each part: 7,7,2

Number of questions to be answered :5,5,1

Marks for parts:

Part A-Short Answer-(5 out of 7)-(5*2=10)

Part B-Short Essay-(5out of 7)-(5*5=25)

Part C-Essay-(1 out of 2)-(1*15=15)

Practical

Total Marks :35

Assessment Methods :Exam-25

Record-5

Viva-5

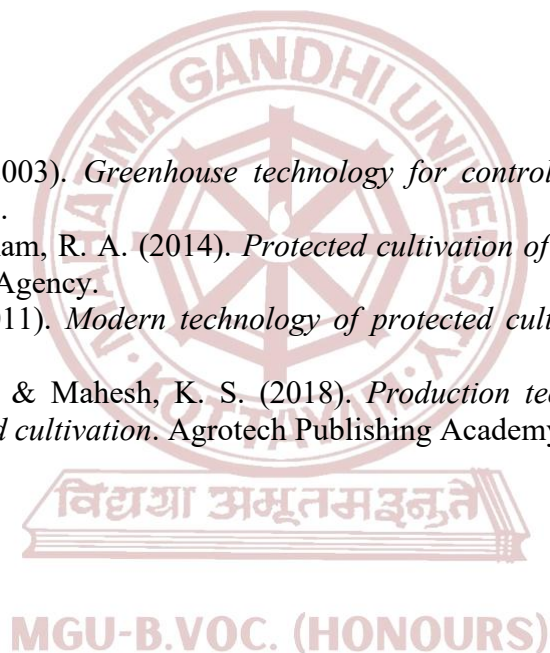
	Duration of Examination :1 hr.
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References

1. Singh, F. (1997). *Advances in floriculture*. Media Today Pvt. Ltd.
2. Prasad, S., & Kumar, U. (1998). *Commercial floriculture*. Agro Botanica.
3. Larson, R. A. (1992). *Introduction to floriculture*. International Book Distributing Co.
4. Yadav, L. P., & Bose, T. K. (1986). *Biology, conservation and culture of orchids*. East-West Press Pvt. Ltd.
5. Yadav, I. S., & Choudhary, M. L. (1997). *Progressive floriculture*. The House of Sarpan (Media).

Suggested Readings

1. Tiwari, G. N. (2003). *Greenhouse technology for controlled environment*. Narosa Publishing House.
2. Chandra, S., & Ram, R. A. (2014). *Protected cultivation of horticultural crops*. New India Publishing Agency.
3. Singh, D. K. (2011). *Modern technology of protected cultivation*. Daya Publishing House.
4. Ravindra, M. P., & Mahesh, K. S. (2018). *Production technology of horticultural crops in protected cultivation*. Agrotech Publishing Academy.



Syllabus



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science			
Programme	B.Voc Agriculture Technology(Honours)			
Course Name	FUNDAMENTALS OF CROP PROTECTION			
Type of Course	SDC			
Course Code	MG2SDCBAT101			
Course Level	100-199			
Course Summary	It provides the understanding and identification of major pests and diseases in various crops and its management practices.			
Semester	2	Credits		Total Hours
Course Details	Learning Approach	Lecture	Practical	
		4	0	
		4	0	60
Pre- requisites, if any	Nil			

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Define the concept of pest ,diseases and weeds and its importance	K	1,2,4,6,8,9,10

2	Classify the major pests and weeds that exhibit in the field	U	1,4,6,9,10
3	Apply the various physical, chemical and biological methods in the field	A	1,2,3,4,6,8,9,10
4	Analyze the major weeds that exist in the crops	An	1,6,8,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	2	0	2	0	2	0	1	1	3
CO 2	2	0	0	1	0	1	0	0	1	2
CO 3	2	2	2	1	0	1	0	1	1	2
CO 4	1	0	0	0	0	1	0	1	0	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs.	CO No.
1	Introduction to Pest		15	
	1.1	Pest, definition characteristic classification.	3	1
	1.2	Major pest of crop of Kerala Rice,Coconut,Banana,Vegetables	7	1
	1.3	Identification and collection of insects.	5	1
2	Major Diseases in Plants		15	
	2.1	Disease ,definition, classification	2	2
	2.2	Disease triangle , disease pyramid.	2	2

	2.3	Disease causing organisms like bacteria, fungi, virus.	5	2
	2.4	Major disease symptoms of vegetable crops.	3	2
	2.5	Identification and collection of diseases in plants.	3	2
	Classification of Weeds		10	
3	3.1	Weed definition, identification	2	3
	3.2	Characteristics, classification	3	3
	3.3	Major weed of crops of Kerala Rice coconut vegetables.	5	3
4	Plant Protection Methods		20	
	4.1	Plant protection methods.	4	4
	4.2	Chemical methods their application.	4	4
	4.3	Physical methods their application.	4	4
	4.4	Biological and their application.	4	4
	4.5	Insecticide, pesticide, weedicide	4	4
5	Teachers Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction)
	Lecture
	Field visit
	Seminars
	Discussion

Assessment Types	<p>MODE OF ASSESSMENT</p> <p>Mode of Assessment : Theory</p>
	<p>A. Continuous Comprehensive Assessment (CCA)</p> <p>Theory Total Marks :30 Assessment Methods :Assignments, In class Discussion, Written test, Oral presentation.</p>
	<p>B.End Semester Evaluation (ESE)</p> <p>Theory Total Marks :70 Assessment Methods Duration of Examination: 2 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C, Answer Type :Short answer, Short Essays, Essays Marks for part: 2, 5, 15 Number of questions in each part :12,6,4 Number of questions to be answered :10,4,2</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(10 out of 12)-(10*2=20) Part B-Short Essay-(4 out of 6)-(4*5=20) Part C-Essay-(2out of 4)-(2*15=30)</p>

References

1. Russell, G. E. (2004). *Crop protection: A colour handbook*. Manson Publishing.
2. Lucas, J. A. (2010). *Plant pathology and plant pathogens* (3rd ed.). Wiley-Blackwell.
3. Abrol, D. P. (2013). *Integrated pest management: Principles and practice*. CABI Publishing.
4. Singh, R. K. (2011). *Crop protection: Principles and practice*. Kalyani Publishers.

5. Tripathi, S. K. (2015). *Plant protection: A comprehensive guide*. New India Publishing Agency.

Suggested Readings

1. Matthews, G. A. (2011). *Pesticides: Health, safety and the environment* (2nd ed.). Wiley-Blackwell.
2. Koul, O., & Cuperus, G. (2007). *Ecologically based integrated pest management* (Vol. 1–2). CABI.
3. Oerke, E. C., Dehne, H. W., Schönbeck, F., & Weber, A. (1994). *Crop production and crop protection: Estimated losses in major food and cash crops*. Elsevier.



MGU-B.VOC. (HONOURS)

Syllabus



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	FUNDAMENTALS OF SOIL SCIENCE				
Type of Course	SDC				
Course Code	MG2SDCBAT102				
Course Level	100-199				
Course Summary	This course helps to familiarize importance of soil and its component. Also get knowledge about soil profile Soil testing- procedure for soil sample collection- preparation of soil sample.				
Semester	2	Credits	4		Total Hours
Course Details	Learning Approach	Lecture	Practical	OJT	
		3	1	0	75
Pre- requisites, if any	Nil				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Show the definition, profile and importance of soil and plant nutrition .	K	3,4,6,8,10
2	Explain the physical properties of soil.	U	1,3,4,10
3	Develop interest towards soil conservation measures.	A	1,2,4,5,6,8,10

4	Examine skill in testing of soil samples.	An	1,3,4,6,9,10
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CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	0	1	2	0	2	0	1	0	2
CO 2	2	0	2	1	0	0	0	0	0	2
CO 3	2	2	0	1	1	1	0	2	0	3
CO 4	2	0	2	2	0	2	0	0	1	2

0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Soil		10	
	1.1	Soil –definition- - components of soil.	3	1
	1.2	Soil profile	3	1
	1.3	Importance of top soil and sub soil-difference between top soil and sub soil.	4	1
2.	Physical Properties of Soil		15	
	2.1	Physical properties of soil-soil texture-soil structure.	5	2
	2.2	density of soil-porosity of soil-soil consistence soil colour.	5	2
	2.3	Soil temperature-soil consistence. Soil air-soil water.	5	2
3	Soil Erosion ,Conservation Measures and Plant Nutrition		20	
	3.1	Soil erosion – definition – different types of Erosion.	2	3
	3.2	Various measures for conservation of soil and	3	3

		water – agronomic measures.		
	3.3	Soil testing- procedure for soil sample collection- preparation of soil sample.	3	3
	3.4	Importance of organic matter in soil	2	3
	3.5	Elements in plant nutrition – what are plant nutrients?	2	3
	3.6	Criteria of essentiality- classification of plant.	3	3
	3.7	Deficiency symptoms of nutrients-control of deficiency-foliar nutrition of plants .	3	3
	3.8	Integrated Nutrient management.	2	3
		Practical	30	
4	4.1	Study of soil profile	6	4
	4.2	Visit to soil testing lab	8	4
	4.3	Estimation of pH	8	4
	4.4	Identification of deficiency symptoms	8	4
5		Teacher Specific		

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminar Discussion
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Assessment Types	<p>MODE OF ASSESSMENT Both</p> <p style="text-align: center;">I. Continuous Comprehensive Assessment (CCA)</p> <p>Theory Total Marks:25 Assessment Methods :Oral presentation,Written test,Assignment,In class discussion.</p> <p>Practical Total Marks :15 Assessment Methods: Viva ,Practical, Assignment</p> <p style="text-align: center;">J. Continuous Comprehensive Assessment (CCA)</p>
	<p style="text-align: center;">K. End Semester Evaluation (ESE)</p> <p>Theory Total Marks : 50 Assessment Methods :Written Exam Duration of Examination :1.50 hr. Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type : Short answer, Short Essays, Essays Marks for part :2, 5, 15 Number of questions in each part: 7,7,2 Number of questions to be answered :5,5,1 Marks for parts: Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical Total Marks :35 Assessment Methods :Exam-25</p>

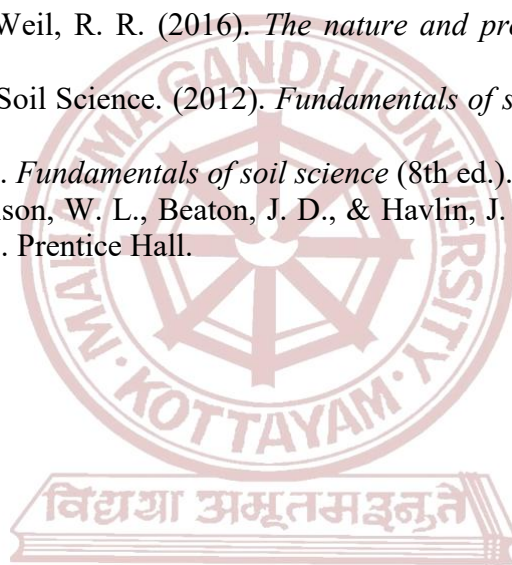
	Record-5 Viva-5 Duration of Examination :1 hr.
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References

1. Das, D. K. (2009). *Introductory soil science*. Kalyani Publishers.
2. Biswas, T. D., & Mukherjee, S. K. (2014). *Textbook of soil science*. McGraw Hill Education Pvt. Ltd.

Suggested Readings

1. Brady, N. C., & Weil, R. R. (2016). *The nature and properties of soils* (15th ed.). Pearson.
2. Indian Society of Soil Science. (2012). *Fundamentals of soil science* (2nd ed.). IARI, New Delhi.
3. Foth, H. D. (1990). *Fundamentals of soil science* (8th ed.). Wiley.
4. Tisdale, S. L., Nelson, W. L., Beaton, J. D., & Havlin, J. L. (2002). *Soil fertility and fertilizers* (6th ed.). Prentice Hall.



MGU-B.VOC. (HONOURS)

Syllabus



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science			
Programme	B.Voc Agriculture Technology(Honours)			
Course Name	PLANT PROPAGATION METHODS			
Type of Course	MDC			
Course Code	MG2MDCBAT100			
Course Level	100-199			
Course Summary	This course helps to understand plant propagation methods Importance of plant propagation in horticulture and agriculture and basic principles of plant growth and development.			
Semester	2	Credits		3
Course Details	Learning Approach	Lecture	Practical	OJT
		2	1	0
		Total Hours		60
Pre- requisites, if any	Nil			

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the basic principles of plant growth and development	K	4,6,10
2	Apply plant propagation methods in	A	1,2,4,6,10

	horticultural crops.		
3	Analyse skills in propagation by seeds.	An	4,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	0	0	1	0	2	0	0	0	1
CO 2	1	1	0	0	0	1	0	0	0	2
CO 3	0	0	0	1	0	0	0	0	0	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

	Units	Course description	Hrs	CO No.
1	Introduction to Plant Propagation		8	
	1.1	Overview of plant propagation methods	2	1
	1.2	Importance of plant propagation in horticulture and agriculture.	3	1
	1.3	Basic principles of plant growth and development	3	1
2	Seed Propagation and Vegetative Propagation		22	
	2.1	Seed structure and germination	2	2
	2.2	Seed selection and preparation	3	2
	2.3	Sowing seeds (e.g., direct sowing, seed trays)	3	2
	2.4	Seedling care and transplanting	4	2
	2.5	Types of vegetative propagation	4	2

	2.6	Grafting, Layering and budding techniques	4	2
	2.7	Grafting, Layering and budding applications	2	2
3	Practical		30	
	3.1	Propagation by grafting and layering	15	3
	3.2	Propagation by budding	15	3
4	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminar Discussion
Assessment Types	MODE OF ASSESSMENT Both
	E. Continuous Comprehensive Assessment (CCA) Theory Total Marks: 15 Assessment Methods :Oral presentation,Written test,Assignment,In class discussion Practical Total Marks : 15 Assessment Methods: Viva ,Practical Assignment
	F. End Semester Evaluation (ESE) Theory Total Marks : 35 Assessment Methods :Written Exam Duration of Examination :1 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C

	<p>Answer Type :Short answer, Short Essays ,Essays</p> <p>Marks for part :2,5,15</p> <p>Number of questions in each part :7,4,2</p> <p>Number of questions to be answered :5,2,1</p> <p>Marks for parts:</p> <p style="padding-left: 40px;">Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p style="padding-left: 40px;">Part B-Short Essay-(2out of 4)-(2*5=10)</p> <p style="padding-left: 40px;">Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical</p> <p style="padding-left: 40px;">Total Marks: 35</p> <p style="padding-left: 40px;">Assessment Methods :Exam-25</p> <p style="padding-left: 80px;">Record-5</p> <p style="padding-left: 80px;">Viva-5</p> <p>Duration of Examination :1 hr</p>
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References

1. Dirr, M. A., & Heuser, C. W., Jr. (2006). *The reference manual of woody plant propagation: From seed to tissue culture* (2nd ed.). Varsity Press.
2. Toogood, A. (1999). *Plant propagation made easy*. DK Publishing.
3. Hartmann, H. T. (1989). *Vegetative propagation of plants*. California Agricultural Experiment Station.

Suggested Readings **MGU-B.VOC. (HONOURS)**

1. Hartmann, H. T., Kester, D. E., Davies, F. T., & Geneve, R. L. (2011). *Hartmann and Kester's plant propagation: Principles and practices* (8th ed.). Prentice Hall.
2. Hudson, T. (2020). *The complete book of plant propagation*. Fox Chapel Publishing.
3. Sadhu, M. K. (1996). *Plant propagation*. New Age International Publishers.
4. Singh, S., & Sharma, R. R. (2018). *Propagation of horticultural crops: Principles and practices* (2nd ed.). New India Publishing Agency.
5. Edmond, J. B., Sen, T. L., Andrews, F. S., & Halfacre, R. G. (1977). *Fundamentals of horticulture* (4th ed.). Tata McGraw-Hill.



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Type of Course	SDC				
Course Name	ON THE JOB TRAINING				
Course Code	MG2SDCBAT103				
Course Summary	<p>On-the-Job Training (OJT) is designed to equip students with practical skills, workplace discipline, and industry exposure by actively engaging them in real-world professional environments. Conducted in collaboration with firms, industries, research institutions, or higher education establishments, OJT enables students to understand industry standards, apply academic knowledge, and perform job-specific tasks using contemporary tools and practices. The training must be undertaken in the student's own skill domain, aligned with the major area of study in their undergraduate program, to ensure relevance and coherence with their academic and career goals. The program also fosters essential workplace competencies such as communication, responsibility, adaptability, and teamwork. Furthermore, it offers students a platform for career exploration and networking, helping them evaluate potential career paths and align their aspirations with industry demands.</p>				
Semester	1	Duration	5 hours/week	Credits	2

COURSE OUTCOMES (CO)

CO No:	Expected Course Outcome	Learning Domains	PO No:

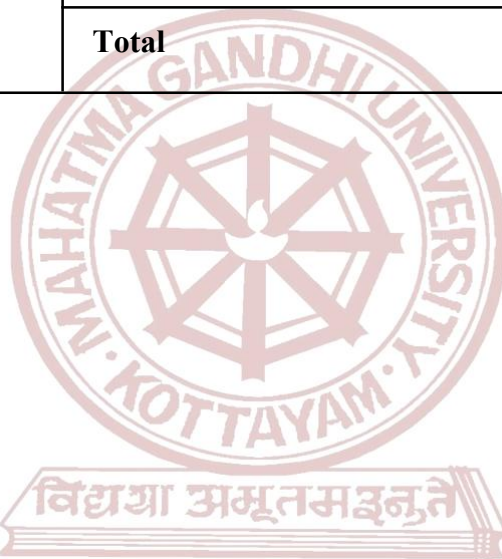
	Upon the successful completion of the course, the student will be able to		
1	Demonstrate the ability to integrate classroom learning with real-world agricultural practices.	Ap	1,3,6,10
2	Apply techniques in crop production, animal husbandry, pest management, soil and water conservation, and sustainable farming.	S	2,4,5,10
3	Integrate academic knowledge with practical applications through internship	An	1,2,3,6,10
4	Identify and evaluate potential career opportunities by reflecting on their internship experiences and professional interactions.	E	1,9,10
*Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)			

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	1	0	0	3	0	0	0	2
CO 2	0	1	0	2	3	0	0	0	0	1
CO 3	1	1	1	0	0	3	0	0	0	3
CO 4	1	0	0	0	2	0	0	0	1	3

Assessment Types	MODE OF ASSESSMENT							
	A	Internal Evaluation						
		<table border="1"> <thead> <tr> <th>Components</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>Feedback from the hosting organization</td> <td>5</td> </tr> <tr> <td>Internal Supervisor feedback</td> <td>10</td> </tr> </tbody> </table>	Components	Marks	Feedback from the hosting organization	5	Internal Supervisor feedback	10
	Components	Marks						
Feedback from the hosting organization	5							
Internal Supervisor feedback	10							

		Total	15
	B	External Evaluation	
		Components	Marks
		Presentation	10
		Report	10
		Viva Voice	15
		Total	35



MGU-B.VOC. (HONOURS)

Syllabus



SEMESTER 3

MGU-B.VOC. (HONOURS)

Syllabus

Course Code	Title of the Course	Type of the Course	Credit	Hours/ week	Hour Distribution /week		
					L	P	O
MG3SDCB AT200	FUNDAMENTALS OF ORGANIC FARMING	SDC	4	4	3	2	0
MG3SDCB AT201	INTEGRATED PEST MANAGEMENT OF CROPS	SDC	4	5	3	2	0
MG3SDCB AT202	PLANTATION CROPS, SPICES AND FRUITS	SDC	4	5	4	0	0
MG3MDC BAT200	INTEGRATED FARMING AND HOMESTEAD FARMING IN KERALA	MDC	3	3	3	0	0
MG3SDCB AT203	ORGANIC CERTIFICATION INTERNSHIP	OJT	2	5	0	0	5
MG3MPC BAT200	FUNDAMENTALS OF ORGANIC FARMING	MPC	4	4	3	2	0



MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science			
Programme	Bvoc Agriculture Technology (Honours)			
Course Name	PLANTATION CROPS ,SPICES AND FRUITS			
Type of Course	SDC			
Course Code	MG3SDCBAT200			
Course Level	200-299			
Course Summary	This course aims to provide knowledge in propagation techniques and management of plantation crops and develop interest in commercial production of fruits.			
Semester	3	Credits		4
Course Details	Learning Approach	Lecture	Practical	OJT
		4	0	
		Total Hours		60
Pre- requisites, if any	Nil			

COURSE OUTCOMES (CO)

Syllabus

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Understand the production ,management and aftercare of coconut and rubber.	U	1,2,3,4,5, 6,7,8,9,10
2	Apply the knowledge of propagation techniques and management of plantation crops.	A	1,2,3,4,5, 6,8,9,10

3	Analyse classification and varieties of spices.	An	1,2,3,8,10
4	Evaluate commercial production of fruits.	E	1,2,3,5,6,8,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	1	2	1	1	2	1	1	1	2
CO 2	2	2	1	1	1	1	0	1	1	2
CO 3	1	2	1	0	0	0	0	1	0	2
CO 4	1	1	1	0	2	1	0	1	0	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Plantation crops		11	
	1.1	Plantation crops, Introduction	2	1
	1.2	Importance - area, production	4	1
	1.3	Management and aftercare of coconut and Rubber.	5	1
2	Management of Plantation crops		11	
	2.1	Plantation crops climate, soil, site selection propagation.	3	2
	2.2	Production of quality planting materials of cashew, tea and coffee.	8	2

3	Introduction to Spices		15	
	3.1	Spices, Definition - classification	3	3

	3.2	Importance to the state.	5	3
	3.3	Varieties - climate, soil – propagation of the following crops: Pepper, cardamom, ginger.	7	3
	Commercial fruit production		23	
4	4.1	Fruits, Importance of commercial fruit production .	4	4
	4.2	Crop management practices - selection and preparation of planting materials, field	7	4
	4.3	Preparation and planting of Crops Banana, mango, and pineapple Fruits, Management practices of crops gaining importance in the state recently rambutan, jackfruit).	12	4
5	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
	MODE OF ASSESSMENT Mode of Assessment
Assessment Types	A. Continuous Comprehensive Assessment (CCA)
	Theory Total Marks :30 Assessment Methods :Oral presentation, Written test, Assignment, In class Discussion

B. End Semester Evaluation (ESE)

Theory

Total Marks :70

Assessment Methods :Written Exam

Duration of Examination : 2 hr

Pattern of examination for Theory: Non-MCQ

Different parts of written examination :Part A, Part B, Part C

Answer Type :Short answer, Short Essays, Essays

Marks for part: 2, 5, 15

Number of questions in each part :12,6,4

Number of questions to be answered :10,4,2

Marks for parts:

Part A-Short Answer-(10 out of 12)-(10*2=20)

Part B-Short Essay-(4 out of 6)-(4*5=20)

Part C-Essay-(2out of 4)-(2*15=30)

References

- 1.Amar Singh. (1986). *Fruit physiology and production*. Kalyani Publishers.
- 2.Bose, T. K., Mitra, S. K., & Sanyal, D. (2002). *Fruits: Tropical and subtropical* (Vols. 1 & 2). Nayaprakash Publications.
- 3.Chadha, K. L. (2001). *Handbook of horticulture*. Indian Council of Agricultural Research (ICAR).
- 4.Hayes, W. B. (1957). *Fruit growing in India*. Kitabistan.
- 5.Kumar, N. (1997). *Introduction to horticulture* (6th ed.). Rajalakshmi Publications.
- 6.Kumar, N., Abdul Khader, J. B. M., Rangaswami, P., & Irulappan. (1993). *Introduction to spices*. [Publisher not specified].
- 7.Menon, K. P. V., & Pandalai, K. M. (1960). *The coconut palm: A monograph*. Indian Central Coconut Committee.
- 8.Mitra, S. K., Bose, T. K., & Rathore, D. S. (1991). *Temperate fruits*. Horticulture and Allied Publishers.
- 9.Naik, K. C. (1949). *South Indian fruits and their culture*. Varadachari & Co.

10. Pruthi, J. S. (1993). *Major spices of India: Crop management and post-harvest technology*. Indian Council of Agricultural Research (ICAR).

11. Purseglove, J. W., Brown, E. G., Green, C. L., & Robbins, S. R. G. (1981). *Spices* (Vols. 1 & 2).

12. Samson, J. A. (1980). *Tropical fruits*. Longman Group.

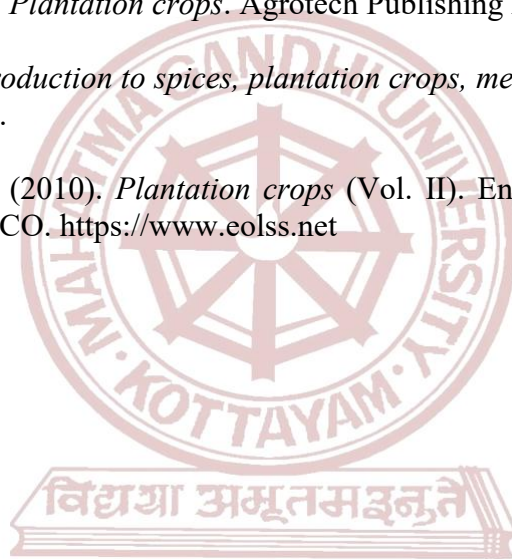
Suggested Readings

1. Shanmugavelu, K. G., Kumar, N., & Peter, K. V. (2004). *Production technology of spices and plantation crops*. Oxford & IBH Publishing..

2. Sundararaju, D. (2006). *Plantation crops*. Agrotech Publishing Academy.

3. Kumar, N. (2008). *Introduction to spices, plantation crops, medicinal and aromatic plants*. Oxford & IBH Publishing.

4. Verheye, W. H. (Ed.). (2010). *Plantation crops* (Vol. II). Encyclopedia of Life Support Systems (EOLSS), UNESCO. <https://www.eolss.net>



MGU-B.VOC. (HONOURS)

Syllabus



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science				
Programme	Bvoc Agriculture Technology(Honours)				
Course Name	INTEGRATED PEST MANAGEMENT OF CROPS				
Type of Course	SDC				
Course Code	MG3SDCBAT201				
Course Level	200-299				
Course Summary	This course provides knowledge on various pest management techniques and helps to develop skills in the preparation of various IPM inputs.				
Semester	3	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	1	0	
Pre- requisites, if any	Nil				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember various concepts related integrated pest management.	K	1,2,3,4,,6 7,8,9
2	Understand tools and various mechanisms in IPM	U	1,2,3,4,5, 6,7,8,9,1 0

3	Apply various methods of IPM in the crops	A	1,2,3,4,5,6,7,8,9,
4	Analyse various groups of microorganisms and preparation of IPM inputs.	An	1,2,3,5,6,8,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	1	2	1	0	2	0	1	1	0
CO 2	1	2	2	1	1	2	0	1	1	1
CO 3	2	2	1	1	1	1	1	1	2	0
CO 4	2	1	1	0	2	2	0	1	1	1

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Integrated Pest Management		15	
	1.1	IPM- introduction, importance, concepts, principles.	5	1
	1.2	Tools of IPM	4	1
	1.3	Tools of IPM- Host plant resistance, definition, mechanisms of resistance, compatibility with other pest management practices - merits and demerits.	6	1
2	Methods of IPM		15	
	2.1	IPM Methods- Cultural methods, Mechanical methods, Physical and Legislative methods, Biological methods- definition.	8	2

	2.2	Method's advantages, limitations.	2	2
	2.3	Natural enemies- parasites, predators and microorganisms used in pest control.	5	2
	Important groups of microorganisms and IPM inputs		15	
3	3.1	Important groups of microorganisms-bacteria, viruses and fungi used in insect pest control.	4	3
	3.2	Mass multiplication techniques of important biocontrol agents.	3	3
	3.4	Preparation of neem oil garlic emulsion and tobacco emulsion.	3	3
	3.5	Fish amino acid and egg amino acid.	2	3
	3.6	Trichocard, Pheromone trap.	3	3
		Practical		30
4	4.1	Familiarization with cultural and mechanical methods of pest control	5	4
	4.2	Identification of predators	7	4
	4.3	Preparation of neem oil garlic emulsion and tobacco decoction	10	4
	4.4	Preparation of spray fluid for field application	8	4
5	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
	MODE OF ASSESSMENT Both
	A. Continuous Comprehensive Assessment (CCA) Theory Total Marks :25 Assessment Methods: Oral presentations, Written test, Assignments, Class discussions Practical Total Marks :15 Assessment Methods :Viva ,Practical ,Assignment
	C. End Semester Evaluation (ESE) Theory Total Marks: 50 Assessment Methods Written Exam Duration of Examination :2 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1 Marks for parts: Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15) Practical Total Marks: 35 Assessment Methods :Exam-25 Record -5 Viva-5

	Duration of Examination :1 hr
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References

1. Dhaliwal, G. S., & Arora, R. (1998). *Principles of insect pest management*. Kalyani Publishers.
2. Mani, M. S. (1968). *General entomology*. Oxford and IBH Publishing Company.
3. Nayar, K. K., Ananthakrishnan, T. N., & David, B. V. (1976). *General and applied entomology*. Tata McGraw-Hill Publishing Company.
4. Pedigo, L. P. (1999). *Entomology and pest management* (3rd ed.). Prentice Hall.
5. Richards, O. W., & Davies, R. G. (1977). *Imm's general textbook of entomology* (Vols. 1 & 2). Chapman and Hall.
6. Srivastava, P. D., & Singh, R. P. (1997). *An introduction to entomology*. Concept Publishing Company.

Suggested Readings

1. Pedigo, L. P., & Rice, M. E. (2014). *Entomology and pest management* (6th ed.). Waveland Press.
2. Triplehorn, C. A., & Johnson, N. F. (2005). *Borror and DeLong's introduction to the study of insects* (7th ed.). Brooks Cole.
3. Gullan, P. J., & Cranston, P. S. (2021). *The insects: An outline of entomology* (6th ed.). Wiley-Blackwell.
4. Richards, O. W., & Davies, R. G. (2017). *Imm's general textbook of entomology* (Vol. 1 & 2). Springer.
5. Daly, H. V., Doyen, J. T., & Purcell, A. H. (1998). *Introduction to insect biology and diversity* (2nd ed.). Oxford University Press.



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science				
Programme	B.voc Agriculture technology(Honours)				
Course Name	FUNDAMENTALS OF ORGANIC FARMING				
Type of Course	SDC				
Course Code	MG3SDCBAT202				
Course Level	200-299				
Course Summary	This course provides knowledge on various concepts in organic farming and develop skills in pest and disease management.				
Semester	3	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	1	0	
Pre- requisites, if any	Nil				

MGU-B.VOC. (HONOURS)

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Define the basic concepts of organic farming and alternate agricultural systems.	K	1,2,3,4,5, 6,7,8,9,10
2	Demonstrate organic farming principles in the field.	U	1,2,3,4,5, 6,7,8,10

3	Develop Skills in pest and disease control methods.	A	1,2,3,5,8,9,10
4	Assume the importance of national agencies and programmes for organic production.	An	1,2,3,6,8,9

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	2	1	1	1	1	2	1	2	2
CO 2	2	2	1	1	1	2	1	1	0	1
CO 3	2	1	1	0	1	0	0	1	1	1
CO 4	1	1	1	0	0	1	0	1	1	0

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Concept of organic farming		17	
	1.1	The concept of sustainability and sustainable development-emerging issues-	2	1
	1.2	Sustainable agriculture-concept themes- differences between conventional, sustainable, and alternate agriculture	4	1
	1.3	Various alternate agricultural systems Conventional, sustainable, and alternate agriculture-	5	1
	1.4	Alternate agricultural systems- biodynamic farming, natural farming, organic farming, permaculture, homa farming, and other forms limitations- Modernization of agriculture and its	6	1

		relation to sustainability.		
2	Organic Agriculture history and tools		9	
	2.1	Organic agriculture-history-concepts- philosophy-objectives, opportunities and priorities-	2	2
	2.2	Criticisms- Organic farming and food security-Principles of organic farming	3	2
		Tools and practices of organic farming: Planned crop rotation, Green manures and cover crops, Manuring and composting, multiple cropping.	3	2
		Intercropping in relation to maintenance of soil productivity.	1	2
Pest and Disease Control Methods of Organic Farming and National Programmes for Organic Production.		19		
3	3.1	Biological pest control: Biological agents -Mass multiplication and familiarization with field application. Different traps and pheromones for pest control. Biocontrol of weeds,	5	3
	3.2	Diseases and insect pests, Sanitation, Tillage and cultivation, Mulching. Supplemental fertilization, Biorational pesticides, Foliar fertilization	4	3
	3.3	, Socio-economic impacts; Marketing and export potential. National Programme for Organic Production (NPOP) - Operational structure of	5	4

		NPOP-		
	3.4	Accreditation agencies- Certification Agencies - National Standards for Organic Products (NSOP). Inspection and certification procedures	5	4
	Practical		30	
4	4.1	Preparation of coir pith and vermicomposting	8	4
	4.2	Plant protection using bioagents and traps	10	4
	4.3	Study and field application of bio fertilizers	12	4
5		Teacher specific		

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Mode of Assessment
	A.Continuous Comprehensive Assessment (CCA) Theory Total Marks :25 Assessment Methods: Oral presentations, Written test,Assignments,Class discussions Practical Total Marks :15 Assessment Methods :Viva,Practical,Assignment

	<p style="text-align: center;">D. End Semester Evaluation (ESE)</p> <p>Theory Total Marks: 50 Assessment Methods Written Exam Duration of Examination :2 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1</p> <p>Marks for parts: Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical Total Marks: 35 Assessment Methods :Exam-25 Record -5 Viva-5</p> <p>Duration of Examination :1 hr</p>
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References

1. Ananthakrishnan, T. N. (Ed.). (1992). *Emerging trends in biological control of phytophagous insects*. Oxford & IBH.
2. Chhonkar, P. K., & Dwivedi, B. S. (2004). Organic farming and its implications on India's food security. *Fertiliser News*, 49(11), 15–18, 21–28, 31, & 38.
3. Gaur, A. C. (1982). *A manual of rural composting*. FAO/UNDP Regional Project Document, FAO.
4. Howard, A. (1940). *An agricultural testament*. Oxford University Press.
5. Lampkin, N. (1990). *Organic farming*. Farming Press Books.
6. Palaniappan, S. P., & Anandurai, K. (1999). *Organic farming: Theory and practice*. Scientific Publishers.
7. Reddy, M. V. (Ed.). (1995). *Soil organisms and litter decomposition in the tropics*. Oxford & IBH.

8.Singh, S. P. (Ed.). (1994). *Technology for production of natural enemies*. Project Directorate of Biological Control.

9.Trewavas, A. (2004). A critical assessment of organic farming and food assertions. [Details incomplete – journal or publication name needed].

10.Trivedi, R. N. (1993). *A textbook of environmental sciences*. Anmol Publications.

11.Veeresh, G. K., Shivashankar, K., & Singlachar, M. A. (1997). *Organic farming and sustainable agriculture*. Association for Promotion of Organic Farming.

12.Woomer, P. L., & Swift, M. J. (1994). *The biological management of tropical soil fertility*. S.

Suggested Readings

1.Palaniappan, S. P., & Annadurai, K. (2006). *Organic farming: Theory and practice*. Scientific Publishers.

2. Lampkin, N. H. (1990). *Organic farming*. Farming Press Books..

3.Reddy, S. R. (2010). *A textbook of organic farming*. Kalyani Publishers..

4. Bhattacharyya, P., & Chakraborty, G. (2005). *Organic farming in India: Problems and prospects*. Allied Publishers.

5. IFOAM – Organics International. (2022). *The IFOAM norms for organic production and processing*. <https://www.ifoam.bio>

6.Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & Seidel, R. (2005). *Environmental, energetic, and economic comparisons of organic and conventional farming systems*. *BioScience*, 55(7), 573–582.

Syllabus



Mahatma Gandhi University
Kottayam

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	INTEGRATED FARMING AND HOMESTEAD FARMING IN KERALA				
Type of Course	MDC				
Course Code	MG3MDCBAT200				
Course Level	200				
Course Summary	This course aims to provide knowledge in sustainable farming agriculture systems and integrated nutrient management systems.				
Semester	3	Credits		3	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	0		
Pre- requisites, if any	Nil				

COURSE OUTCOMES (CO)

Syllabus

CO No.	Expected Course Outcomes	Learning Domains	PO No
1	Understand the concepts such as integrated farming and sustainable agriculture farming systems	U	1,2,5,6,8,10
2	Apply soil health management practices in homestead farming and also the pest and disease management.	A	1,2,3,5,6,8,10

3	Develop interest towards integrated nutrient management.	I	1,2,6,7,10
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CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	1	0	0	1	2	0	1	0	1
CO 2	2	2	1	0	1	1	0	1	0	1
CO 3	1	1	0	0	0	1	1	0	0	1

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Integrated Farming		15	
	1.1	Introduction to Integrated Farming	3	1
	1.2	Principles of Integrated Farming: Understanding the concept and benefits of integrated farming systems	7	1
	1.3	Sustainable Agriculture: Introduction to sustainable agriculture practices and their importance	5	1
2	Homestead Farming		17	
	2.1	Homestead Farming Basics: Understanding the concept and benefits of homestead farming	5	2
	2.2	Crop Selection and Planning: Choosing the right crops for homestead farming and planning for a productive homestead.	7	2
	2.3	Soil Health and Management: Importance of soil health and	5	2

		management practices for homestead farming.		
	Integrated Nutrient Management		13	
3	3.1	Integrated Nutrient Management Definition Scope importance	4	3
	3.2	INM Principles: Understanding the principles and benefits of integrated nutrient management	4	3
	3.3	Pest and Disease Management: Integrated pest and disease management strategies	5	3
5		Teacher Specific		

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
	MODE OF ASSESSMENT Mode of Assessment
Assessment Types	B. Continuous Comprehensive Assessment (CCA)
	Theory Total Marks :25 Assessment Methods :Oral presentations, Written test, Assignment, in class Discussion.

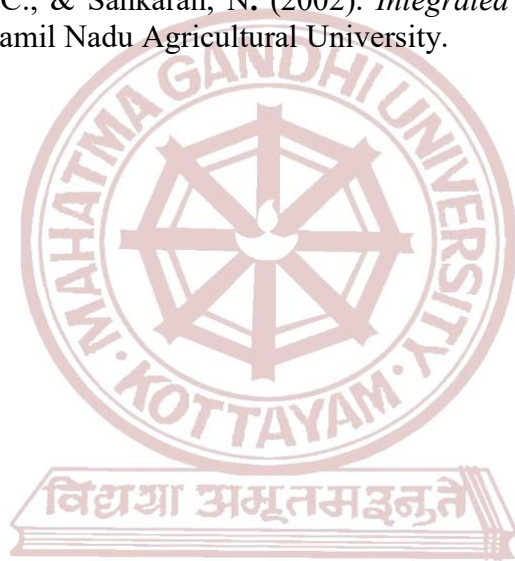
	<p>C. End Semester Evaluation (ESE)</p> <p>Theory Total Marks :50 Assessment Methods :Written exam</p> <p>Duration of Examination :1.50 hr</p> <p>Pattern of examination for Theory :Non-MCQ</p> <p>Different parts of written examination: Part A, Part B, Part C,</p> <p>Answer Type :Short answer,Short essays, Essays</p> <p>Marks for part :2,5,15</p> <p>Number of questions in each part :7,7,2</p> <p>Number of questions to be answered :5,5,1</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p>Part B-Short Essay-(5out of 7)-(5*5=25)</p> <p>Part C-Essay-(1 out of 2)-(1*15=15)</p>
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References

- 1.Chandran, V., Saurav, S. K., & Chakravarty, R. (2023). Contribution of integrated farming system (IFS) units towards household income in Kerala. *Indian Journal of Extension Education*, 59(1).
- 2.Hali, R. (n.d.). *Krishipadam* [Media/communication work].
- 3.Hosure, S., & Rajeev, T. S. (2021). *Agro eco zones in southern-central Kerala*. IIP Books.
- 4.Jayadeva, H. M., & Ramachandrappa, B. K. (2021). *Integrated farming systems*. Brillion Publishing.
- 5.Nair, M. G. N., Jayalekshmi, G., & Kishorekumar, N. (2019). Utility of integrated farming systems: A perception study from Kuttanad, Kerala. *Agricultural Science Digest*, 39(4).
- 6.Nair, P. K. R. (2006). *Tropical homegardens: A time-tested example of sustainable agroforestry*. In *Advances in Agroforestry Series*. Springer.
- 7.Shukla, A. K., et al. (2021). *Horticulture based integrated farming systems*. New India Publishing Agency (NIPA).
- 8.Sreekumar, K. M., Thamban, C., & Govindan, M. (2006).

Suggested Readings

1. Palaniappan, S. P., & Sivaraman, K. (2006). *Cropping systems in the tropics: Principles and management* (2nd ed.). New Age International.
2. Beets, W. C. (1990). *Raising and sustaining productivity of smallholder farming systems in the tropics*. AgBé Publishing.
3. Reddy, T. Y., & Reddy, G. H. S. (2019). *Principles of agronomy* (6th ed.). Kalyani Publishers..
4. Nair, P. K. R. (1993). *An introduction to agroforestry*. Springer..
5. Jayanthi, C., Vennila, C., & Sankaran, N. (2002). *Integrated farming system: A path to sustainable agriculture*. Tamil Nadu Agricultural University.



MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Course Name	On-the-Job Training				
Type of Course	SDC				
Course Code	MG3SDCBAT203				
Course Summary	<p>On-the-Job Training (OJT) is designed to equip students with practical skills, workplace discipline, and industry exposure by actively engaging them in real-world professional environments. Conducted in collaboration with firms, industries, research institutions, or higher education establishments, OJT enables students to understand industry standards, apply academic knowledge, and perform job-specific tasks using contemporary tools and practices. The training must be undertaken in the student's own skill domain, aligned with the major area of study in their undergraduate program, to ensure relevance and coherence with their academic and career goals. The program also fosters essential workplace competencies such as communication, responsibility, adaptability, and teamwork. Furthermore, it offers students a platform for career exploration and networking, helping them evaluate potential career paths and align their aspirations with industry demands.</p>				
Semester	1	Duration	5 hours/week	Credits	2

COURSE OUTCOMES (CO)

CO No:	Expected Course Outcome	Learning Domains	PO No:
	Upon the successful completion of the course, the student will be able to		
1	Demonstrate the ability to integrate classroom learning with real-world agricultural practices.	Ap	1,3,6,10
2	Apply techniques in crop production, animal husbandry, pest management, soil and water conservation, and sustainable farming.	S	2,4,5,10
3	Integrate academic knowledge with practical applications through internship	An	1,2,3,6,10
4	Identify and evaluate potential career opportunities by reflecting on their internship experiences and professional interactions.	E	1,9,10
<p><i>*Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)</i></p>			

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	1	0	0	3	0	0	0	2
CO 2	0	1	0	2	3	0	0	0	0	1
CO 3	1	1	1	0	0	3	0	0	0	3
CO 4	1	0	0	0	2	0	0	0	1	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Assessment Types	MODE OF ASSESSMENT	
	A	Internal Evaluation

		Components	Marks
		Feedback from the hosting organization	5
		Internal Supervisor feedback	10
		Total	15
	B	External Evaluation	
		Components	Marks
		Presentation	10
		Report	10
		Viva Voce	15
		Total	35



MGU-B.VOC. (HONOURS)

Syllabus



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science			
Programme	B.voc Agriculture technology(Honours)			
Course Name	FUNDAMENTALS OF ORGANIC FARMING			
Type of Course	MPC			
Course Code	MG3MPCBAT200			
Course Level	200-299			
Course Summary	This course provides knowledge on various concepts in organic farming and develop skills in pest and disease management.			
Semester	3	Credits		4
Course Details	Learning Approach	Lecture	Practical	OJT
		3	1	0
		Total Hours		75
Pre- requisites, if any	Nil			

MGU-B.VOC. (HONOURS)

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Define the basic concepts of organic farming and alternate agricultural systems.	K	1,2,3,4,5, 6,7,8,9,10
2	Demonstrate organic farming principles in the field.	U	1,2,3,4,5, 6,7,8,10

3	Develop Skills in pest and disease control methods.	A	1,2,3,5,8,9,10
4	Assume the importance of national agencies and programmes for organic production.	An	1,2,3,6,8,9

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	2	1	1	1	1	2	1	2	2
CO 2	2	2	1	1	1	2	1	1	0	1
CO 3	2	1	1	0	1	0	0	1	1	1
CO 4	1	1	1	0	0	1	0	1	1	0

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Concept of organic farming		17	
	1.1	The concept of sustainability and sustainable development-emerging issues-	2	1
	1.2	Sustainable agriculture-concept themes- differences between conventional, sustainable, and alternate agriculture	4	1
	1.3	Various alternate agricultural systems Conventional, sustainable, and alternate agriculture-	5	1
	1.4	Alternate agricultural systems- biodynamic farming, natural farming, organic farming, permaculture, homa farming, and other forms limitations- Modernization of agriculture and its	6	1

		relation to sustainability.		
2	Organic Agriculture history and tools		9	
	2.1	Organic agriculture-history-concepts- philosophy-objectives, opportunities and priorities-	2	2
	2.2	Criticisms- Organic farming and food security-Principles of organic farming	3	2
		Tools and practices of organic farming: Planned crop rotation, Green manures and cover crops, Manuring and composting, multiple cropping.	3	2
		Intercropping in relation to maintenance of soil productivity.	1	2
Pest and Disease Control Methods of Organic Farming and National Programmes for Organic Production.		19		
3	3.1	Biological pest control: Biological agents -Mass multiplication and familiarization with field application. Different traps and pheromones for pest control. Biocontrol of weeds,	5	3
	3.2	Diseases and insect pests, Sanitation, Tillage and cultivation, Mulching. Supplemental fertilization, Biorational pesticides, Foliar fertilization	4	3
	3.3	, Socio-economic impacts; Marketing and export potential. National Programme for Organic Production (NPOP) - Operational structure of	5	4

		NPOP-		
	3.4	Accreditation agencies- Certification Agencies - National Standards for Organic Products (NSOP). Inspection and certification procedures	5	4
	Practical		30	
4	4.1	Preparation of coir pith and vermicomposting	8	4
	4.2	Plant protection using bioagents and traps	10	4
	4.3	Study and field application of bio fertilizers	12	4
5		Teacher specific		

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Mode of Assessment
	A.Continuous Comprehensive Assessment (CCA) Theory Total Marks :25 Assessment Methods: Oral presentations, Written test,Assignments,Class discussions Practical Total Marks :15 Assessment Methods :Viva,Practical,Assignment

	<p align="center">E. End Semester Evaluation (ESE)</p> <p>Theory Total Marks: 50 Assessment Methods Written Exam Duration of Examination :2 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1</p> <p>Marks for parts: Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical Total Marks: 35 Assessment Methods :Exam-25 Record -5 Viva-5</p> <p>Duration of Examination :1 hr</p>
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References

1. Ananthakrishnan, T. N. (Ed.). (1992). *Emerging trends in biological control of phytophagous insects*. Oxford & IBH.
2. Chhonkar, P. K., & Dwivedi, B. S. (2004). Organic farming and its implications on India's food security. *Fertiliser News*, 49(11), 15–18, 21–28, 31, & 38.
3. Gaur, A. C. (1982). *A manual of rural composting*. FAO/UNDP Regional Project Document, FAO.
4. Howard, A. (1940). *An agricultural testament*. Oxford University Press.
5. Lampkin, N. (1990). *Organic farming*. Farming Press Books.
6. Palaniappan, S. P., & Anandurai, K. (1999). *Organic farming: Theory and practice*. Scientific Publishers.
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8.Singh, S. P. (Ed.). (1994). *Technology for production of natural enemies*. Project Directorate of Biological Control.

9.Trewavas, A. (2004). A critical assessment of organic farming and food assertions. [Details incomplete – journal or publication name needed].

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11.Veeresh, G. K., Shivashankar, K., & Singlachar, M. A. (1997). *Organic farming and sustainable agriculture*. Association for Promotion of Organic Farming.

12.Woomer, P. L., & Swift, M. J. (1994). *The biological management of tropical soil fertility*. S.

Suggested Readings

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3.Reddy, S. R. (2010). *A textbook of organic farming*. Kalyani Publishers..

4. Bhattacharyya, P., & Chakraborty, G. (2005). *Organic farming in India: Problems and prospects*. Allied Publishers.

5. IFOAM – Organics International. (2022). *The IFOAM norms for organic production and processing*. <https://www.ifoam.bio>

6.Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & Seidel, R. (2005). *Environmental, energetic, and economic comparisons of organic and conventional farming systems*. *BioScience*, 55(7), 573–582.

Syllabus



SEMESTER -4

MGU-B.VOC. (HONOURS)

Syllabus

Course Code	Title of the Course	Type of the Course	Credit	Hours/ week	Hour Distribution /week		
					L	P	O
MG4SDCB AT200	LIVESTOCK FARMING	SDC	4	4	4	0	0
MG4SDCB AT201	COMMERCIAL VEGETABLE PRODUCTION	SDC	4	5	3	2	0
MG4SDCB AT202	FARM POWER AND MACHINERY	SDC	4	5	3	2	0
MG4SECB AT200	FUNDAMENTALS OF AGRICULTURAL ENGINEERING	SEC	3	3	3	0	0
MG4VAC BAT200	ENVIRONMENTAL STUDIES	VAC	3	3	3	0	0
MG4INTB AT200	SUMMER INTERNSHIP	INT	2		0	0	2
MG4MPC BAT200	COMMERCIAL VEGETABLE PRODUCTION	MPC	4	5	3	2	0



MGU-B.VOC. (HONOURS)

Syllabus

Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science			
Programme	B.Voc Agriculture Technology (Honours)			
Course Name	LIVESTOCK FARMING			
Type of Course	SDC			
Course Code	MG4SDCBAT200			
Course Level	200-299			
Course Summary	This course aims to provide general management practices in dairy farming and poultry.			
Semester	4	Credits		
Course Details	Learning Approach	Lecture	Practical	4
		4	0	0
		OJT		Total Hours
				60
Pre- requisites, if any	Nil			

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Name general management practices in dairy farming and cattle and Buffalo management.	K	3,6,10

2.	Understand Cattle and Buffalo management practices	U	3,6,10
3.	Analyse milk chemistry and milk constituents	An	1,3,5,10
4.	Apply knowledge of poultry management.	A	1,2,1,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	0	1	0	0	2	0	0	0	2
CO 2	0	0	1	0	0	1	0	0	0	2
CO 3	1	0	1	0	0	1	0	0	0	1
CO 4	1	0	0	0	2	1	0	0	0	1

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Livestock Farming and its Importance		12	
	1.1	General Management Practices in Dairy farming- Grooming, Drying off, Control of bad habits, Castration, Dehorning, Trimming, Shoeing, Identification marks, removing extra teats.	12	1
2	Cattle and Buffalo Management		17	
	2.1	Cattle and Buffalo management- Housing of Cattle, Calf raising, Heifer management.	6	2

	2.2	Management of pregnant and lactating cow .Sheep and Goat	5	2
	2.3	management- Housing of sheep and goat, Diseases and General management practices.	6	2
	Milk Chemistry and Milk constituents		19	
3	3.1	Definition of Milk, Composition of Milk, Constituent of Milk	7	3
	3.2	Factors affecting Quality and Quantity of milk, Nutritive value of milk,	6	3
	3.3	Physico-chemical properties of milk. Clean milk production: Source of contamination.	6	3
	Poultry Management		12	
4	4.1	Housing of Poultry, General Management practices, Pig Farming, Rabbit Farming, Duck Farming- Breeds of duck,	12	4
	5	Teacher Specific		

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Theory F. Continuous Comprehensive Assessment (CCA) Theory Total Marks :30 Assessment Methods :Oral presentation, Written test,

	Assignment, In class Discussion
	<p>G. End Semester Evaluation (ESE)</p> <p>Theory Total Marks :70 Assessment Methods :Written Exam Duration of Examination : 2 hr Pattern of examination for Theory: Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part: 2, 5, 15 Number of questions in each part :12,6,4 Number of questions to be answered :10,4,2</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(10 out of 12)-(10*2=20) Part B-Short Essay-(4 out of 6)-(4*5=20) Part C-Essay-(2out of 4)-(2*15=30)</p>

References

1. Banarjee, G. C. (n.d.). *A textbook of animal husbandry*.
2. Bhikane, A. U., & Kawitkar, S. B. (n.d.). *A textbook of animal science*.
3. Mudgal, V. D., Singhal, K. K., & Sharma, D. D. (n.d.). *Advances in dairy animal production*.
4. Indian Council of Agricultural Research (ICAR). (n.d.). *Handbook of animal husbandry*. ICAR Publication.
5. Prasad, J. (n.d.). *Animal husbandry & dairy science*.

Suggested Readings

1. Ensminger, M. E., & Parker, R. O. (2019). *Beef cattle science* (7th ed.). Pearson.
2. Church, D. C., & Pond, W. G. (2021). *Basic animal nutrition and feeding* (5th ed.). Wiley.
3. Fraser, D., Mench, J. A., & Millman, S. T. (2023). *Farm animal welfare* (2nd ed.). CABI.
4. Singh, R. A. (2005). *Textbook of animal husbandry* (8th ed.). Oxford & IBH Publishing.



Mahatma Gandhi University
Kottayam

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Course Name	COMMERICAL VEGETABLE PRODUCTION				
Type of Course	SDC				
Course Code	MG4SDCBAT201				
Course Level	200-299				
Course Summary	This course aims to provide knowledge and skill in vegetable production.				
Semester	4	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	1		
Pre- requisites, if any	MGU-B.VOC. (HONOURS)				

COURSE OUTCOMES (CO)

Syllabus

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the nutrient value of vegetable crops and factors affecting vegetable production and growth regulators.	K	2,6,8,10
2	Understand various factors affecting vegetable production.	U	3,5,6,10
3	Apply Knowledge of vegetable	A	1,2,10

	cultivation in the field.		
4	Analyse various types of vegetable farming.	An	1,2

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	1	0	0	0	1	0	1	0	1
CO 2	0	0	1	0	1	1	0	0	0	2
CO 3	1	1	0	0	0	0	0	0	0	2
CO 4	2	1	0	0	0	0	0	0	0	0

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Vegetable Crops		13	
	1.1	Introduction - Importance and scope of vegetable crops of India with special emphasis to Kerala.	4	1
	1.2	Nutritional importance-nutrient value of vegetables, Classification of vegetables - types of classification and their bases - Botanical, cultural, thermo classification	5	1
	1.3	Classification based on parts used.	4	1
2	Factors Affecting Vegetable Production		15	
	2.1	Factors affecting vegetable production- soil, temperature, light, water, nutrients.	4	2
	2.2	Basic principles of vegetable production. Nursery, sowing and transplanting, Care and	6	2

		management		
	2.3	Growth regulators -role of growth regulators in vegetable production and methods of application	5	2
3	Types of Vegetable Farming and Tropical Vegetables		17	
	3.1	Types of vegetable farming - Kitchen garden; Market garden; Truck garden.	3	3
	3.2	Vegetable forcing; Vegetable garden for seed production; Hydroponics, aeroponics, Riverbed system, Terrace Garden etc.	4	3
	3.3	Tropical vegetable- Importance, varieties, cultivation, for Solanaceous crops- tomato, brinjal and chilli- Cucurbits- bitter gourd, snake gourd, cucumber, ,watermelon and ivy gourd.	4	3
	3.4	Leguminous crops- vegetable cow pea and winged bean. Cole crops- cabbage cauliflower. Root crops- carrot, radish, beetroot. Bulb crops- onion, garlic. Other vegetables- okra, and Amaranthus.	6	3
4	Practical		30	
	4.1	Main field preparation and planting of direct sown vegetable crops	7	4
	4.2	. Familiarization of different vegetable crops	8	4
	4.3	Planting of cool season vegetables	10	4

	4.4	Visit to the farmer's fields in the vegetable growing areas to study the field problems faced by the farmers	5	4
5	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars discussion
Assessment Types	MODE OF ASSESSMENT Mode of Assessment
	D. Continuous Comprehensive Assessment (CCA) Theory Total Marks :25 Assessment Methods: Oral presentations, Written test, Assignments, Class discussions Practical Total Marks :15 Assessment Methods :Viva, Practical, Assignment
	H. End Semester Evaluation (ESE) Theory Total Marks: 50 Assessment Methods Written Exam Duration of Examination :2 hr Pattern of examination for Theory : Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1 Marks for parts: Part A -Short Answer-(5 out of 7)-(5*2=10) Part B -Short Essay-(5out of 7)-(5*5=25)

	<p>Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical</p> <p>Total Marks: 35</p> <p>Assessment Methods :Exam-25 Record -5 Viva-5</p> <p>Duration of Examination :1 hr</p>
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References

1. Beena, N., Singh, K. P., & Chand, P. (n.d.). *Fundamentals of vegetable crop production*.
2. Lal, L. (n.d.). *Production technology for vegetables*.
3. Fortier, J. M. (2014). *The market gardener: A successful grower's handbook for small-scale organic farming*. New Society Publishers.
4. Coleman, E. (1995). *The new organic grower: A master's manual of tools and techniques for the home and market gardener* (2nd ed.). Chelsea Green Publishing.
5. Smith, E. C. (2009). *The vegetable gardener's Bible* (2nd ed.). Storey Publishing.

Suggested Readings

1. AVDRC – The World Vegetable Center. (2020). *Vegetable production and practices: A training manual*. <https://avrdc.org>
2. Bose, T. K., Som, M. G., & Kabir, J. (2003). *Vegetable crops* (Vol. I & II, Revised ed.). Naya Udyog..
3. Rana, M. K. (2011). *Vegetable crop science*. CRC Press.
4. Rubatzky, V. E., & Yamaguchi, M. (2012). *World vegetables: Principles, production, and nutritive values* (2nd ed.). Springer.



Mahatma Gandhi University
Kottayam

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Course Name	FARM POWER AND MACHINERY				
Type of Course	SDC				
Course Code	MG4SDCBAT202				
Course Level	200-299				
Course Summary	This course helps to understand the farm mechanization-scope of farm mechanization sources of farm power - merits and demerits of different forms of power				
Semester	4	Credits	4		
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	1		
Pre- requisites, if any	Nil				

COURSE OUTCOMES (CO)

Syllabus

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the scope and importance of farm mechanization and working of internal combustion engines.	K	1,6,10
2	Understand working of Internal Combustion engines.	U	2,3,10
3	Apply knowledge of ploughing and	A	1,4,10

	tilling in the agricultural field.		
4	Analyse tools and equipments in a farm machinery workshop.	An	1,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	0	0	0	2	0	0	0	2
CO 2	0	2	1	0	0	0	0	0	0	2
CO 3	2	0	0	1	0	0	0	0	0	1
CO 4	1	0	0	0	0	0	0	0	0	1

0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Farm Power		7	
	1.1	Status of farm power in India and Kerala.	3	1
	1.2	Sources of farm power - merits and demerits of different forms of power.	2	1
	1.3	Farm mechanization-scope of farm mechanization.	2	1
2	Internal combustion engines and Farm Tractor		13	
	2.1	Principle of working of internal combustion engines. Terminology connected with engine power.	3	2

	2.2	Fuel system, lubrication system and cooling system of IC engines.	3	2
	2.3	Farm tractor -classification-components and selection.	2	2
	2.4	Hydraulic control system of tractor. Power tiller-components of power tiller	2	2
	2.5	Principles of operation of electric motor-types-components-care and maintenance.	3	2
	Tillage and Ploughing		10	
3	3.1	Tillage definition importance type.	2	3
	3.2	Plough-classification-types-components-adjustments and repairs of mould board plough and disc plough. Plough accessories like coulter, jointer, scraper, land wheel and gauge wheels.	4	3
	3.3	Terminology connected with ploughs-advantages and disadvantages of different ploughs.	4	3
	Tillage		30	
4	4.1	Study of tools and equipments in a farm machinery workshop.	6	4
	4.2	Study of different components of an IC engine	8	4
	4.3	Study of different components and operation of tractor.	8	4

	4.4	Study of mouldboard plough and disc plough and its adjustment	8	4
5	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
	MODE OF ASSESSMENT Mode of Assessment
Assessment Types	<p>Continuous Comprehensive Assessment (CCA)</p> <p>Theory Total Marks :25 Assessment Methods: Oral presentations, Written test, Assignments, Class discussions</p> <p>Practical Total Marks :15 Assessment Methods :Viva, Practical ,Assignment</p>
	<p>I. End Semester Evaluation (ESE)</p> <p>Theory Total Marks: 50 Assessment Methods Written Exam</p> <p>Duration of Examination :2 hr</p> <p>Pattern of examination for Theory :Non-MCQ</p> <p>Different parts of written examination :Part A, Part B, Part C</p> <p>Answer Type :Short answer, Short Essays, Essays</p> <p>Marks for part :2,5,15</p> <p>Number of questions in each part :7,7,2</p> <p>Number of questions to be answered :5,5,1</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p>Part B-Short Essay-(5out of 7)-(5*5=25)</p> <p>Part C-Essay-(1 out of 2)-(1*15=15)</p>

	<p>Practical</p> <p>Total Marks: 35</p> <p>Assessment Methods :Exam-25 Record -5 Viva-5</p> <p>Duration of Examination :1 hr</p>
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References

- 1.Chakraverty,(1981).*Post harvest technology of cereals and pulses*.Oxford and IBH Publishing Co.,Calcutta.
- 2.Mohsenin,N.N,(1970).*Physical properties of plant and animal materials*.Gordon and Breach publishers,New york.
- 3.Pande,P.H,(1994).*Principles of agricultural processing*.Kalyani Publishers,Ludhiana.
- 4.Sahay,K.Mand K.K Singh(1994).*Unit operations in agricultural processing*.Vikas publishing House Pvt.Ltd.New Delhi.

Suggested Readings

- 1.Ojha, T. P., & Michael, A. M. (2016). *Principles of agricultural engineering: Volume I* (7th ed.). Jain Brothers..
2. Smith, H. P., & Wilkes, L. H. (2021). *Farm machinery and equipment* (7th ed.). McGraw-Hill Education.
3. Kepner, R. A., Bainer, R., & Barger, E. L. (2005). *Principles of farm machinery* (3rd ed.). CBS Publishers & Distributors.
4. Liljedahl, J. B., Turnquist, P. K., Smith, D. W., & Hoki, M. (2011). *Tractors and their power units* (4th ed.). Springer..
5. Pandey, P., & Singh, S. (2010). *Farm machinery for horticultural crops*. ICAR..
6. Mehta, M. L., Verma, S. R., Mishra, J. P., & Sharma, V. K. (2015). *Fundamentals of farm machinery and power engineering* (6th ed.). Jain Brothers.



Mahatma Gandhi University Kottayam

Faculty/ Discipline	Science					
Programme	B.Voc Agriculture Technology (Honours)					
Course Name	FUNDAMENTALS OF AGRICULTURAL ENGINEERING					
Type of Course	SEC					
Course Code	MG4SECBAT200					
Course Level	200-299					
Course Summary	This course helps to develop understanding on the importance of irrigation and create interest to water harvesting techniques.					
Semester	4	Credits			3	Total Hours
Course Details	Learning Approach	Lecture	Practical	OJT		
		3	0	0	45	
Pre- requisites, if any	Nil					

COURSE OUTCOMES (CO)

Syllabus

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Understand the importance of irrigation in agriculture and also the difference between rainfed and dryland agriculture.	U	3,6,10
2	Apply evapotranspiration equations in various measurement parameters.	A	1,2,5,10
3	Analyse various water harvesting	An	2,6,9

	techniques.	
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CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	0	1	0	0	1	0	0	0	1
CO 2	2	1	0	0	1	0	0	0	0	1
CO 3	0	1	0	0	0	2	0	0	1	0

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1		Irrigation	11	
	1.1	Definition and objectives Types	3	1
	1.2	Role of water in soil and plants	4	1
	1.3	Irrigated agriculture vs. Rainfed agriculture, dry farming and dryland farming-definition.	4	1
2		Evapo-transpiration and Methods of Irrigation	18	
	2.1	Evapo-transpiration, potential evapo-transpiration	5	2
	2.2	Methods of determining water requirement-effective rainfall.	4	2
	2.3	Methods of irrigation surface irrigation, sprinkler, drip -	5	2
	2.4	Agronomic techniques to improve water use efficiency- factors affecting water use efficiency.	4	2

	Water Harvesting Techniques		16	
3	3.1	Water harvesting techniques	8	3
	3.2	In situ and ex situ water harvesting methods Farm ponds, percolation ponds or wells, check basin, minor irrigation tanks.	8	3
4	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Mode of Assessment
	E. Continuous Comprehensive Assessment (CCA) Theory Total Marks:25 Assessment Methods :Oral presentation, Written test, Assignment, In class discussion.
	F. End Semester Evaluation (ESE) Theory Total Marks :50 Assessment Methods Duration of Examination : 1.50 hr Pattern of examination for Theory : Non-MCQ} Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Problems, Short Essays, Essays, Marks for part :2,5,15 Number of questions in each part :7,7,2

	<p>Number of questions to be answered :5,5,1</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p>Part B-Short Essay-(5out of 7)-(5*5=25)</p> <p>Part C-Essay-(1 out of 2)-(1*15=15)</p>
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References

- 1.Dhruvanarayana, V. V. (1993). *Soil and water conservation research in India*. Indian Council of Agricultural Research.
- 2.Singh, G., Venkataraman, C., Sastry, B., & Joshi, P. (1990). *Manual of soil and water conservation practices*. Oxford & IBH Publishing Co.
- 3.Hansen, V. E., Israelsen, O. W., & Stringham, G. E. (1979). *Irrigation principles and practices* (4th ed.). John Wiley & Sons.
- 4.Lenka, D. (2001). *Irrigation and drainage*. Kalyani Publishers.
- 5.Mal, B. C. (2002). *Introduction to soil and water conservation engineering*. Kalyani Publishers.
- 6.Michael, A. M., & Ojha, T. P. (2005). *Principles of agricultural engineering* (Vol. 2). Jain Brothers.
- 7.Michael, A. M. (1988). *Irrigation theory and practice*. Vikas Publishing House Pvt. Ltd.

Syllabus

Suggested Readings

- 1.Michael, A. M. (2012). *Irrigation: Theory and practice* (2nd ed.). Vikas Publishing.
2. Ojha, T. P., & Michael, A. M. (2016). *Principles of agricultural engineering: Volume I* (7th ed.). Jain Brothers.
- 3.Michael, A. M., & Ojha, T. P. (2017). *Principles of agricultural engineering: Volume II* (7th ed.). Jain Brothers.
4. Sahay, J. (2014). *Elements of agricultural engineering* (5th ed.). Standard Publishers.
5. Raghunath, H. M. (2006). *Groundwater* (3rd ed.). New Age International.



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science			
Programme	B.Voc Agriculture Technology (Honours)			
Course Name	ENVIRONMENTAL STUDIES			
Type of Course	VAC			
Course Code	MG4VACBAT200			
Course Level	200-299			
Course Summary	This course helps to understand human Population and the Environment :Population growth, variation among nations Population explosion and Environmental pollutions			
Semester	4	Credits		3
Course Details	Learning Approach	Lecture	Practical	OJT
		3	0	0
Total Hours	45			
Pre- requisites, if any	Nil			

MGU-B.VOC. (HONOURS)

COURSE OUTCOMES (CO)

Syllabus

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the concepts of environmental science and sustainable development.	K	1,2,3,6,8
2	Understand the causes of various pollutions.	U	1,6,8
3	Apply of knowledge of conservation	A	6,8,10

	of biodiversity.	
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CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	1	1	0	0	6	0	2	0	0
CO 2	1	0	0	0	0	2	0	1	0	0
CO 3	0	0	0	0	0	2	0	2	0	1

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Environment Science		12	
	1.1	Introduction to Environment Science :Development and Environment	4	1
	1.2	Human Population and the Environment :Population growth, variation among nations Population explosion .	8	1
2	Environmental Pollutions		17	
	2.1	Air pollution, water pollution, soil pollution, noise pollution -causes and impacts.	5	2
	2.2	Causes and Consequences: Understanding the causes and consequences of environmental pollution	5	2
	2.3	Importance of Pollution Control: Importance of controlling environmental pollution for sustainable	7	2

		development		
3	Biodiversity and its Conservation		16	
	3.1	Introduction ,definition: genetic ,species and ecosystem diversity.	3	3
	3.2	Values of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.	5	3
	3.3	India as a mega diversity nation, hotspots of biodiversity, threats to biodiversity: habitat loss, poaching of wild life, man- wildlife conflicts, endangered and endemic species of India.	8	3
4	Teachers Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction)
	Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Theory

G. Continuous Comprehensive Assessment (CCA)

Theory

Total Marks :25

Assessment Methods :Oral presentations, Written test, Assignment, in class Discussion.

H. End Semester Evaluation (ESE)

Theory

Total Marks :50

Assessment Methods :Written exam

Duration of Examination :1.50 hr

Pattern of examination for Theory :Non-MCQ

Different parts of written examination: Part A, Part B, Part C,

Answer Type :Short answer, Short essays, Essays

Marks for part :2,5,15

Number of questions in each part :7,7,2

Number of questions to be answered :5,5,1

Marks for parts:

Part A-Short Answer-(5 out of 7)-(5*2=10)

Part B-Short Essay-(5out of 7)-(5*5=25)

Part C-Essay-(1 out of 2)-(1*15=15)

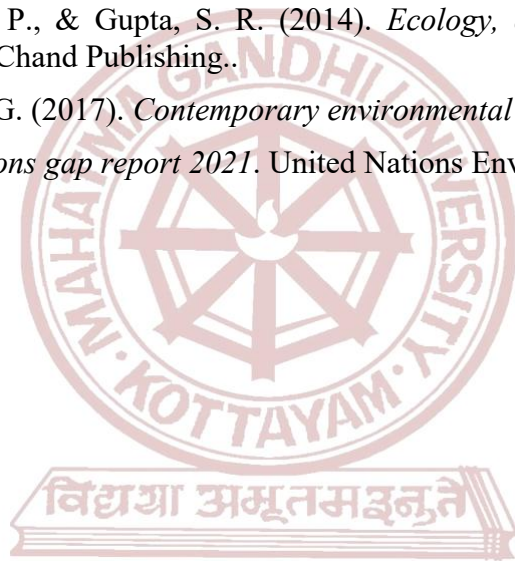
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1.Bharucha, E. (2005). *Textbook of environmental studies for undergraduate courses*. University Grants Commission, India. Orient Blackswan.

2. Cunningham, W. P., & Cunningham, M. A. (2017). *Principles of environmental science: Inquiry and applications* (8th ed.). McGraw-Hill Education.
3. Enger, E., & Smith, B. (2016). *Environmental science: A study of interrelationships* (15th ed.). Cengage Learning.
4. Raven, P. H., Hassenzahl, D. M., & Berg, L. R. (2018). *Environment* (10th ed.). Wiley.
5. Botkin, D. B., & Keller, E. A. (2014). *Environmental science: Earth as a living planet* (9th ed.). Wiley.

Suggested Readings

1. Miller, G. T., & Spoolman, S. E. (2020). *Living in the environment* (20th ed.).
2. Odum, E. P., & Barrett, G. W. (2004). *Fundamentals of ecology* (5th ed.). Brooks/Cole..
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5. UNEP. (2021). *Emissions gap report 2021*. United Nations Environment Programme.



MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	Summer Internship				
Type of Course	INT				
Course Code	MG4INTBAT200				
Course Summary	<p>The internship is designed to provide students with real-world exposure and hands-on experience in professional environments aligned with their skill domain and major area of study. It acts as a vital link between academic learning and industry application, allowing students to apply theoretical concepts to practical situations. Through active engagement in industry, research institutions, or academic labs, students gain insights into organizational operations, workplace practices, and professional expectations. The internship also supports the development of key professional competencies such as communication, teamwork, time management, and ethical responsibility. Additionally, it encourages critical thinking, reflection, and self-assessment, helping students identify personal strengths and explore potential career pathways. Students shall undergo the internship in a Firm, Industry, or Organization, or engage in Training in Labs with faculty and researchers, or other Higher Education or Research Institutions, ensuring alignment with their area of academic specialization.</p>				
Semester	4	Duration	60 hours	Credits	2

COURSE OUTCOMES (CO)

CO No:	Expected Course Outcome	Learning Domains	PO No:
1	Demonstrate practical understanding of operational aspects in their domain by engaging in real-world industry settings.	Ap	1,3,6,10

2	Apply academic knowledge and skills to identify and solve industry-relevant problems.	A	1,2,3,10
3	Exhibit professional competencies including effective communication, teamwork, time management, and ethical responsibility.	S	4,5,8,9
4	Develop an understanding of workplace practices, expectations, and challenges.	U	1,6,10
5	Reflect critically on their internship experience to identify personal strengths, growth areas, and career aspirations.	E	1,6,10
Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)			

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	1	0	0	2	0	0	0	1
CO 2	1	1	2	0	1	0	0	0	0	1
CO 3	0	0	0	1	1	0	0	2	1	0
CO 4	1	0	0	0	1	0	0	0	0	1
CO 5	1	0	0	0	0	1	0	0	0	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

MGU-B.VOC. (HONOURS)

		MODE OF ASSESSMENT	
		A	Internal Evaluation
Assessment Types	A	Components	Marks
		Feedback from the hosting organization	5
		Internal Supervisor feedback	10
		Total	15
	B	External Evaluation	
		Components	Marks
		Presentation	10
		Report	10

	Viva Voice	15
	Total	35



MGU-B.VOC. (HONOURS)

Syllabus



Mahatma Gandhi University
Kottayam

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Course Name	COMMERICAL VEGETABLE PRODUCTION				
Type of Course	MPC				
Course Code	MG4MPCBAT200				
Course Level	200-299				
Course Summary	This course aims to provide knowledge and skill in vegetable production.				
Semester	4	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	1		
Pre- requisites, if any	MGU-B.VOC. (HONOURS)				

COURSE OUTCOMES (CO)

Syllabus

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the nutrient value of vegetable crops and factors affecting vegetable production and growth regulators.	K	2,6,8,10
2	Understand various factors affecting vegetable production.	U	3,5,6,10
3	Apply Knowledge of vegetable	A	1,2,10

	cultivation in the field.		
4	Analyse various types of vegetable farming.	An	1,2

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	1	0	0	0	1	0	1	0	1
CO 2	0	0	1	0	1	1	0	0	0	2
CO 3	1	1	0	0	0	0	0	0	0	2
CO 4	2	1	0	0	0	0	0	0	0	0

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Vegetable Crops		13	
	1.1	Introduction - Importance and scope of vegetable crops of India with special emphasis to Kerala.	4	1
	1.2	Nutritional importance-nutrient value of vegetables, Classification of vegetables - types of classification and their bases - Botanical, cultural, thermo classification	5	1
	1.3	Classification based on parts used.	4	1
2	Factors Affecting Vegetable Production		15	
	2.1	Factors affecting vegetable production- soil, temperature, light, water, nutrients.	4	2
	2.2	Basic principles of vegetable production. Nursery, sowing and transplanting, Care and	6	2

		management		
	2.3	Growth regulators -role of growth regulators in vegetable production and methods of application	5	2
3	Types of Vegetable Farming and Tropical Vegetables		17	
	3.1	Types of vegetable farming - Kitchen garden; Market garden; Truck garden.	3	3
	3.2	Vegetable forcing; Vegetable garden for seed production; Hydroponics, aeroponics, Riverbed system, Terrace Garden etc.	4	3
	3.3	Tropical vegetable- Importance, varieties, cultivation, for Solanaceous crops- tomato, brinjal and chilli- Cucurbits- bitter gourd, snake gourd, cucumber, ,watermelon and ivy gourd.	4	3
	3.4	Leguminous crops- vegetable cow pea and winged bean. Cole crops- cabbage cauliflower. Root crops- carrot, radish, beetroot. Bulb crops- onion, garlic. Other vegetables- okra, and Amaranthus.	6	3
4	Practical		30	
	4.1	Main field preparation and planting of direct sown vegetable crops	7	4
	4.2	. Familiarization of different vegetable crops	8	4
	4.3	Planting of cool season vegetables	10	4

	4.4	Visit to the farmer's fields in the vegetable growing areas to study the field problems faced by the farmers	5	4
5	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars discussion
Assessment Types	MODE OF ASSESSMENT Mode of Assessment
	I. Continuous Comprehensive Assessment (CCA) Theory Total Marks :25 Assessment Methods: Oral presentations, Written test, Assignments, Class discussions Practical Total Marks :15 Assessment Methods :Viva, Practical, Assignment
	J. End Semester Evaluation (ESE) Theory Total Marks: 50 Assessment Methods Written Exam Duration of Examination :2 hr Pattern of examination for Theory : Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1 Marks for parts: Part A -Short Answer-(5 out of 7)-(5*2=10) Part B -Short Essay-(5out of 7)-(5*5=25)

	<p>Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical</p> <p>Total Marks: 35</p> <p>Assessment Methods :Exam-25 Record -5 Viva-5</p> <p>Duration of Examination :1 hr</p>
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References

1. Beena, N., Singh, K. P., & Chand, P. (n.d.). *Fundamentals of vegetable crop production*.
2. Lal, L. (n.d.). *Production technology for vegetables*.
3. Fortier, J. M. (2014). *The market gardener: A successful grower's handbook for small-scale organic farming*. New Society Publishers.
4. Coleman, E. (1995). *The new organic grower: A master's manual of tools and techniques for the home and market gardener* (2nd ed.). Chelsea Green Publishing.
5. Smith, E. C. (2009). *The vegetable gardener's Bible* (2nd ed.). Storey Publishing.

Suggested Readings

1. AVDRC – The World Vegetable Center. (2020). *Vegetable production and practices: A training manual*. <https://avrdc.org>
2. Bose, T. K., Som, M. G., & Kabir, J. (2003). *Vegetable crops* (Vol. I & II, Revised ed.). Naya Udyog..
3. Rana, M. K. (2011). *Vegetable crop science*. CRC Press.
4. Rubatzky, V. E., & Yamaguchi, M. (2012). *World vegetables: Principles, production, and nutritive values* (2nd ed.). Springer.



SEMESTER 5

MGU-B.VOC. (HONOURS)

Syllabus

Course Code	Title of the Course	Type of the Course	Credit	Hours/ week	Hour Distribution /week		
					L	P	O
MG5SDCB AT300	INFORMATION TECHNOLOGY AND NETWORKING FOR AGRICULTURE	SDC	4	4	4	0	0
MG5SDEB AT301	TISSUE CULTURE AND CROP IMPROVEMENT	SDCE	4	5	3	2	0
MG5SDEB AT302	WEATHER FORECASTING AND CLIMATE CHANGE	SDCE	4	5	3	2	0
MG5SDCB AT303	PRINCIPLES OF AGRIBUSINESS MANAGEMENT	SDC	4	5	3	2	0
MG5SECB AT300	COMMERCIAL ENTERPRISES	SEC	3	4	2	2	0
MG5VAC BAT300	AGRICULTURE WASTE MANAGEMENT	VAC	3	3	3	0	0
MG5MPC BAT300	PRINCIPLES OF AGRIBUSINESS MANAGEMENT	MPC	4	4	4	0	0

MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	INFORMATION TECHNOLOGY AND NETWORKING FOR AGRICULTURE				
Type of Course	SDC				
Course Code	MG5SDCBAT300				
Course Level	300-399				
Course Summary	It explains the importance of smart farming, and the integration of advanced technology in order to increase production efficiency and quality of agriculture produce. It gives an idea about the various storage devices used for harvesting in agriculture robotics				
Semester	5	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		4	0		
Pre- requisites, if any	Nil				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the various irrigation methods	K	1,2,3,9,10
2	Understand the various machineries and storage devices used for automation	U	1,2,3,9,10
3	Understand the various censurers and timers used for irrigation control,	U	1,2,3,9,10

	precision farming		
4	Analyse the fertilizer application process through automation	A	1,2,3,4,6,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	2	2	0	0	0	0	0	2	2
CO 2	1	2	3	0	0	0	0	0	2	3
CO 3	2	2	1	0	0	0	0	0	1	2
CO 4	2	2	2	2	0	1	0	0	3	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Automation of Irrigation Positive Effects		15	
	1.1	Monitor weather and soil conditions, evaporation and plant status.	6	1
	1.2	Censurers and timers for irrigation controls and mechanization in water gun and sprinklers (to save labour and water.	9	1
2	Automation of Fertilizer Application		17	
	2.1	Precision farming importance, Scope objectives.	4	2
	2.2	Fertilizer scheduling and automation of fertigation to get greater controls on maximum production.	8	2
	2.3	Scheduling for off season production.	5	2
	Serial Devices for Forecasting Pests and Diseases		11	

3	3.1	Meteorological Data Analysis.	5	3
	3.2	Interpretation of Forecasting Diseases and Pests.	6	3
4	Storage Devices in Agriculture Robotics		17	
	4.1	Ripening chamber, storage incubators and their automation .	5	4
	4.2	Storage Devices controls agriculture robotics for fruit and vegetable harvesting.	7	4
	4.3	Imported machineries for harvesting sorting and grading.	5	4
5	Teachers Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Theory
	K. Continuous Comprehensive Assessment (CCA) Theory Total Marks :30 Assessment Methods :Oral presentation, Written test, Assignment, In class Discussion
	L. End Semester Evaluation (ESE) Theory Total Marks :70

	<p style="text-align: center;">Assessment Methods :Written Exam</p> <p>Duration of Examination : 2 hr</p> <p>Pattern of examination for Theory: Non-MCQ</p> <p>Different parts of written examination :Part A, Part B, Part C</p> <p>Answer Type :Short answer, Short Essays, Essays</p> <p>Marks for part: 2, 5, 15</p> <p>Number of questions in each part :12,6,4</p> <p>Number of questions to be answered :10,4,2</p> <p>Marks for parts:</p> <p style="padding-left: 40px;">Part A-Short Answer-(10 out of 12)-(10*2=20)</p> <p style="padding-left: 40px;">Part B-Short Essay-(4 out of 6)-(4*5=20)</p> <p style="padding-left: 40px;">Part C-Essay-(2out of 4)-(2*15=30)</p>
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References

1. Choudhury, A., Biswas, A., Prateek, M., & Chakrabarti, A. (Eds.). (2021). Agricultural Informatics: Automation Using the IoT and Machine Learning. Scrivener Publishing.
2. Dimitrov, D. (Ed.). (2023). Internet and Computers for Agriculture. MDPI Books.
3. He, Y., Zhang, Q., & Nie, P. (2022). Agricultural Internet of Things: Technologies and Applications. Springer.
4. Bodake, P. S., Iyengar, S., & Mohod, A. G. (Eds.). (2024). Information Technology for Agriculture (C. R. Chavan & B. Lal, Compilers). NIPA.
5. Ravi, G., Mubeena, M., Veldandi, A., & Shaktawat, P. (2024). ICT & Its Applications in Agriculture. Publish My Work.
6. Jaisridhar, P., & Surudhi. (2020). Communication Technologies in Agriculture. NIPA.

Syllabus

Suggested Readings

1. World Bank. (2011). ICT in agriculture: Connecting smallholders to knowledge, networks and institutions. World Bank.
2. Saravanan, R. (2011). Information and communication technology for agriculture and rural development.
3. AG Publishing House. (2023). Agricultural extension communication and the role of ICT. AG Publishing House.



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science			
Programme	B.Voc Agriculture Technology(Honours)			
Course Name	TISSUE CULTURE AND CROP IMPROVEMENT			
Type of Course	SDCE			
Course Code	MG5SDEBAT301			
Course Level	300-399			
Course Summary	This course provide the details of the various in vitro culture techniques performed in the laboratory and its importance in the present and future generation. It focus on the practical application of the various tissue culture techniques for the easier development of plants with identical characters. It also helps to understand how to apply the tissue culture techniques in crop improvement.			
Semester	5	Credits		4
Course Details	Learning Approach	Lecture	Practical	OJT
		3	1	
				Total Hours
				75
Pre- requisites, if any	Nil			

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Understand the concept of in vitro culture and the factors, Somaclonal variation, Embryogenesis, Morphogenesis Protoplast isolation and the secondary metabolites	U	1,2,3,4,6, 8,9,10

2	Apply the concept of in vitro culture in laboratories	A	1,2,3,4,6,9,10
3	Apply the concept of synthetic seed production in laboratories	A	1,2,3,4,5,6,9,10
4	Analyse the various secondary metabolites present in the plant materials	An	1,2,4,5,8,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	3	1	2	0	1	0	2	2	2
CO 2	2	3	2	2	0	1	0	0	2	3
CO 3	2	2	3	1	2	2	0	0	1	2
CO 4	1	1	0	2	1	0	0	1	1	1

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Principles of Totipotency		14	
	1.1	Principles of totipotency and morphogenesis .	5	1
	1.2	Nutritional requirements of in-vitro cultures.	4	1
	1.3	Tissue culture as a tool in genetic engineering, Applications in crop improvement.	5	1
2	Techniques of In-vitro cultures		16	

	2.1	Techniques of In-vitro cultures: Micro propagation, Anther culture, Pollen culture, Ovule culture, Embryo culture, Test tube fertilization, Endosperm culture.	10	2
	2.2	Factors affecting above in-vitro culture.	2	2
	2.3	Applications and achievements of techniques of In-vitro cultures.	4	2
3	Somaclonal Variation and Somatic Embryogenesis		15	
	3.1	Somaclonal variation, Types, Reasons.	4	3
	3.2	Somatic embryogenesis and synthetic seed production technology.	5	3
	3.3	Protoplast isolation, Culture, Manipulation and Fusion, Products of somatic hybrids and cybrids.	6	3
4	Practical		30	
	4.1	Demonstration of Anther and Embryo Culture	10	4
	4.2	Demonstration of Inoculation of Explant	6	4
	4.3	Demonstration of Synthetic Seed Production	6	4
	4.4	Preparation of Nutrient Media	8	4
5	Teachers Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Both M. Continuous Comprehensive Assessment (CCA) Theory Total Marks: 25 Assessment Methods :oral presentation,Written test,Assignment,In class discussion Practical Total Marks : 15 Assessment Methods: Viva ,Practical, Assignment <hr/> N. End Semester Evaluation (ESE) Theory Total Marks: 50 Assessment Methods Written Exam Duration of Examination :2 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1 Marks for parts: Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15) Practical Total Marks: 35

	Assessment Methods :Exam-25 Record-5 Viva-5 Duration of Examination :1 hr
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References

1. Smith, R. H. (3rd ed., 2012). Plant tissue culture: Techniques and experiments. Academic Press.
2. Chawla H S. (2009). Introduction to Plant Biotechnology. Science Publishers.
3. Brown, T.A. (2016). Gene cloning an Introduction (7th edition). Wiley-Blackwell.
4. Nelson, D. L., & Cox, M. M. (2017). Lehninger principles of biochemistry (7th ed.). W. H. Freeman.
5. Watson, J. D., et al. (2014). Molecular biology of the gene (7th ed.). Pearson.
6. Singh, B.D. (1998). Biotechnology. Kalyani Publications, New Delhi.

Suggested Readings

1. Sinkar, S. R., & Rai, M. (2026). Plant tissue culture: Principles, tools, and techniques (1st ed.). Routledge.
2. Sharma, V., & Alam, A. (2015). Plant tissue culture. I.K. International.
3. Kumar, S., Mishra, S., & Mishra, A. P. (2016). Plant tissue culture: Theory and techniques (1st ed.). Scientific Publishers.
4. Reddy, J. (2024). Plant tissue culture. CRC Press.
5. Neumann, K.-H., Kumar, A., & Imani, J. (2020). Plant cell and tissue culture – A tool in biotechnology: Basics and application (2nd ed.). Springer Cham.

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	WEATHER FORECASTING AND CLIMATE CHANGE				
Type of Course	SDCE				
Course Code	MG5SDEBAT301				
Course Level	300-399				
Course Summary	This course provides the information regarding the various meteorological aspects in relation with crop production. It also provides the details regarding the weather forecasting measures . it creates an awareness on the major causes of the climate change that occur in the universe.				
Semester	5	Credits		4	Total Hours
Course Details	Learning Approach	Lecture	Practical	OJT	
		3	1	0	75
Pre- requisites, if any	NIL				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the concept of atmosphere and the various factors affecting the climatic condition	R	1,2,3,4,9,10
2	Understand the different forms of rainfall ,cloud types and agricultural	U	1,2,3,4,6,9,10

	seasons and crop calendar		
3	Understand the various factors affecting the atmospheric condition	U	1,2,3,4,6,9,10
4	Analyse the rainfall and cloud forms	An	1,2,3,4,6,8,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	2	1	0	0	0	0	1	1
CO 2	2	2	2	2	0	2	0	0	2	2
CO 3	2	1	2	1	0	1	0	0	1	2
CO 4	2	2	3	1	0	2	0	1	2	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Meteorology and Agricultural Meteorology		12	
	1.1	Introduction to Meteorology and Agricultural Meteorology - Scope and importance of Agricultural Meteorology.	4	1
	1.2	Composition of Atmosphere	3	1
	1.3	Role of greenhouse gases in global cooling and warming - Concept of weather and climate.	5	1
2	Atmospheric Conditions		14	
	2.1	Atmospheric pressure and its variation with height - Global distribution of pressure and wind.	5	2

	2.2	Atmospheric humidity - saturation and actual vapour pressure - relative humidity and dew point temperature.	6	2
	2.3	Soil temperature and its variations.	3	2
	Rainfall and Weather Forecasting		19	
3	3.1	Rainfall and its mechanisms - forms and types of rainfall - Indian monsoons - southwest monsoon - northeast monsoon- monsoon variability across Kerala and India.	6	3
	3.2	Cloud classification and measurements - cloud seeding.	4	3
	3.3	Importance of weather forecasting in Agriculture - weather service to farmers.	4	3
	3.4	Role of weather on insect pest and diseases.	3	3
	3.5	Agricultural seasons - crop weather diagrams and calendars - crop weather relationships.	2	3
	Practical		30	
4	4.1	Designing of a crop calendar	6	4
	4.2	Observation of the atmospheric condition and prepare a Report	6	4
	4.3	Demonstration of the layers of atmosphere	5	4
	4.4	Demonstration of the types of clouds	6	4
	4.5	Preparation of crop weather diagram	7	4
5	Teachers Specific			

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Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Both O. Continuous Comprehensive Assessment (CCA) Theory Total Marks: 25 Assessment Methods :oral presentation, Written test, Assignment, In class discussion Practical Total Marks : 15 Assessment Methods: Viva ,Practical Assignment P. End Semester Evaluation (ESE) Theory Total Marks: 50 Assessment Methods :Written Exam Duration of Examination :2 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1 Marks for parts: Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5 out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15) Practical

	<p>Total Marks: 35</p> <p>Assessment Methods :Exam-25 Record-5 Viva-5</p> <p>Duration of Examination :1 hr</p>
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References

1. Ahmad, L., Kanth, R. H., Parvaze, S., & Mahdi, S. S. (2017). Experimental agrometeorology: A practical manual. Springer.
2. Stigter, K. (Ed.). (Year unknown). Applied agrometeorology. Springer.
3. Ahmad, L., Biswas, A., Warland, J., & Anjum, I. (2023). Climate change and agrometeorology. Springer Singapore.
4. Seemann, J., Chirkov, Y. I., Lomas, J., & Primault, B. (1979). Agrometeorology. Springer-Verlag.
5. Das, S. (2023). Introductory agrometeorology. Scientific Publishers.
6. Mavi, H. S. (2022). Introduction to agrometeorology (2nd ed.). CBS Publishers & Distributors.
7. Kathiresan, G. (2015). Agrometeorology: A simplified textbook. NIPA.

Suggested Readings

1. Kovacs, T. (2025). Weather and climate forecasting: The scientific method in action (2nd ed.). Kendall Hunt Publishers.
2. Ahrens, C. D. (2007). Meteorology today: An introduction to weather, climate, and the environment. Thomson/Brooks/Cole.
3. Hakim, G. J., & Patoux, J. (2018). Weather: a concise introduction. Cambridge University Press.
4. Revkin, A., & Mechaley, L. (2018). Weather: an illustrated history: From cloud atlases to climate change. Sterling.



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Course Name	PRINCIPLES OF AGRIBUSINESS MANAGEMENT				
Type of Course	SDC				
Course Code	MG5SDCBAT303				
Course Level	300-399				
Course Summary	This course familiarise the fundamentals of information and communication management. It provides a detailed information about the various entrepreneurship strategies.				
Semester	5	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	1		
Pre- requisites, if any	Nil				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the role of communication channels	K	1,3,4,5,6,9,10
2	Understand the communication system,types of Business organization and the agricultural information system	U	1,2,3,4,6,9,10
3	Understand the concept of Entrepreneurship Development	U	1,2,3,4,6,9,10

4	Analyse the various phases of EDP and the procedures involved in the development of a business plan and the phases of a project cycle	An	1,2,3,4,5,6,8,9,10
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CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	1	3	1	2	0	0	2	2
CO 2	2	1	2	1	0	1	0	0	1	2
CO 3	2	2	1	2	0	1	0	0	2	1
CO 4	2	1	2	2	1	2	0	1	2	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Information and communication management		9	
	1.1	Fundamentals of information and communication- solving agricultural problems with information systems- a managerial overview of information and communication.	2	1
	1.2	Information-characteristics, Information Vs Knowledge, ABC nature of information, Information as a crucial resource.	2	1
	1.3	Different channels of information - communication- Radio, TV, Video, E-mail, Network connecting devices-intranet, internet, Photography, basics -its use in ICM, Digital	3	1

		Photography -its advantages.		
	1.4	Agricultural Information System - Agricultural databases - Definition and objectives, Decision Support system, Expert system.	2	1
2	Agribusiness Organisations		13	
	2.1	Management of agro based industries. Agribusiness-concept, nature and scope of agribusiness, Business-status present role and future prospects, forms of agribusiness organizations-their advantages and disadvantages.	3	2
	2.2	Understanding entrepreneurship-need for EDP, entrepreneurial process, entrepreneurial traits and competence-dynamics of entrepreneurship.	2	2
	2.3	Agribusiness-concept, nature and scope of agribusiness, Business-status present role and future prospects, forms of agribusiness organizations-their advantages and disadvantages.	4	2
	2.4	Preparing business plan-what is a business plan? Characteristics of a good business plan, elements of business plan, why some plans fail? licensing-government policies and sanction, certification and patent law.	2	2
	2.5	Agribusiness development, steps in setting up a small	2	2

		enterprise analysis of opportunities. Small business management, the process of management, organizing the enterprise.		
3	Marketing Management and Agricultural Projects		23	
	3.1	Concept of marketing management - Marketing - new concept - business marketing - ,holistic marketing - marketing management process.	3	3
	3.2	Marketing mix - Market structure and Consumer buying behavior. Marketing environment-Responding to market environment Marketing opportunities analysis - marketing management tasks, Marketing Planning Process.	4	3
	3.3	New product development process - Challenges in new product development.	3	3
	3.4	Project concept- definitions- project approach to development, Agricultural projects.	5	3
	3.5	Characteristics- relationship of projects with plans and programmes. Phases of project cycle- identification- formulation, appraisal, implementation- monitoring and evaluation	5	3
	3.6	Risk in agricultural projects- methods of handling risk projects	3	3
4	Practical		30	
	4.1	Prepare a model of Business plan	6	4

	4.2	Interview with an Entrepreneur	8	4
	4.3	New product development	9	4
	4.5	Preparation of a model agricultural project	7	4
5		Teacher Specific		

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Both
	Q. Continuous Comprehensive Assessment (CCA) Theory Total Marks: 30 Assessment Methods :Oral presentation, Written test, Assignment, In class discussion MGU-B.VOC. (HONOURS) Syllabus
	R. End Semester Evaluation (ESE) Theory Total Marks: 50 Assessment Methods Written Exam Duration of Examination :1.5 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1 Marks for parts:

	<p>Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p>Part B-Short Essay-(5out of 7)-(5*5=25)</p> <p>Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical Total Marks: 35 Assessment Methods :Exam-25 Record-5 Viva-5</p> <p>Duration of Examination :1 hr</p>
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References

1. Akridge, J. T., & Telfer, S. L. (2015). Agribusiness management (7th ed.). Pearson Education.
2. Hancock, J., & Lattz, M. (2016). Introduction to agribusiness (2nd ed.). Cengage Learning.
3. Cramer, G. L., Jensen, J. D., & Southgate, D. (2016). Agricultural economics and agribusiness (6th ed.). Wiley.
4. Sharma, R. K. (2017). Agribusiness management (1st ed.). Macmillan Publishers India.
5. Baker, L., & Chaddad, F. R. (2019). Agribusiness: Principles of management (2nd ed.). Oxford University Press.
6. Kotler, P., & Armstrong, G. (2017). Principles of marketing (17th ed.). Pearson Education.
7. Dixon, M., & Kieran, C. (2020). Managing agribusiness: The essential guide to business strategy in the agriculture sector. Routledge.

Syllabus

Suggested Readings

1. Barnard, F. L., Foltz, J. C., Yeager, E. A., & Brewer, B. (2021). Agribusiness management (6th ed.). Routledge.
2. Akridge, J. T., Foltz, J. C., Yeager, E. A., Brewer, B., & Malone, T. (2025?). Agribusiness Management (7th ed.). Routledge.



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science					
Programme	B.Voc Agriculture Technology(Honours)					
Course Name	COMMERCIAL ENTERPRISES					
Type of Course	SEC					
Course Code	MG5SECBAT300					
Course Level	300-399					
Course Summary	This course helps to understand various commercial enterprises such as sericulture, apiculture and mushroom cultivation in agricultural sector through observation, field visits and presentation.					
Semester	5	Credits			3	Total Hours
Course Details	Learning Approach	Lecture	Practical	OJT		
		2	1	0	60	
Pre- requisites, if any	MGU-B.VOC. (HONOURS)					

COURSE OUTCOMES (CO)

Syllabus

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the rearing of honeybees, types of honey bees and bee products.	R	1,2,4,6,8, 9,10
2	Understand the methods of spawn production and its cultivation	U	1,2,4,5,6, 9,10
4	Apply the concept of mushroom cultivation	A	1,2,3,4,5, 6,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	0	1	0	2	0	1	1	3
CO 2	2	2	1	2	1	2	0	0	1	2
CO 3	2	2	2	2	1	2	0	0	1	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Beekeeping and Sericulture		14	
	1.1	History and development. Honey bees- kinds of bees, biology-Hiving and domestication. Seasonal management of bees. Bee pasturage. Scope of apiculture in Kerala.	3	1
	1.2	Bee products- extraction, uses, composition and preservation.	2	1
	1.3	Diseases and enemies of honey bees and their control. Bee poisoning.	2	1
	1.4	History and development. Types of silkworms in India - morphology, biology, rearing of silkworms. Host plants and their cultivation.	3	1
	1.5	Diseases and enemies of silkworm and their control.	2	1
	1.6	Use of biotechnology in sericulture. Scope of sericulture in Kerala.	2	1
2	Sericulture		16	
	2.1	Importance of mushroom cultivation - definition of mushroom - its importance.	1	2

	2.2	Preparation of pure culture of mushrooms and their nutritional requirements.	3	2
	2.3	Definition of spawn, substrate for spawn, types of spawn, methods of spawn production, characteristic of a good spawn, storage of spawn.	3	2
	2.4	Cultivation of <i>Agaricus</i> species - composting - its formulation, casing, preparation of casing mixture, sterilization, cultivation of <i>Pleurotus</i> , <i>Volvariella</i> .	3	2
	2.5	Different types of substrates, substrate preparation and sterilization, Spawning, methods of spawning, spawn run phase, cropping.	3	2
	2.6	Identification and management of different pests and diseases of mushrooms. Methods of harvesting mushrooms.	3	2
	MGU-B.VOC. (HONOURS) Practical		30	
3	4.1	Handling of bee colonies, Extraction and processing of honey, Visit to apiaries.	8	3
	4.2	Laboratory rearing of mulberry silkworms and visit to rearing units.	7	3
	4.3	Identification of common edible and poisonous mushrooms.	5	3
	4.5	Oyster mushroom cultivation.	10	3
4	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Both
	A. Continuous Comprehensive Assessment (CCA) Theory Total Marks :15 Assessment Methods : Oral presentation, Written test, Assignment, In class Discussion Practical Total Marks :15 Assessment Methods :Practical Assignment,Viva
	B. End Semester Evaluation (ESE) Theory Total Marks : 35 Assessment Methods :Written Exam Duration of Examination :1 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays ,Essays Marks for part :2,5,15 Number of questions in each part :7,4,2 Number of questions to be answered :5,2,1 Marks for parts: Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(2out of 4)-(2*5=10) Part C-Essay-(1 out of 2)-(1*15=15) Practical Total Marks: 35 Assessment Methods :Exam-25 Record-5 Viva-5

Duration of Examination :1 hr

References

1. Chang, S. T., & Hayes, J. M. (2017). The biology and cultivation of edible mushrooms (2nd ed.). Academic Press.
2. Stamets, P. (2000). Growing gourmet and medicinal mushrooms (3rd ed.). Ten Speed Press.
3. Choudhury, M. D. (2011). Sericulture and silk industry in India. Kalyani Publishers
4. Kraut, A. E. (2019). Beekeeping for dummies. Wiley.
5. Tiwari, S. N. (2013). Sericulture: Principles and practices. New India Publishing.
6. Crane, E. (1999). The world history of beekeeping and honey hunting. Routledge.

Suggested Readings

1. Goud, R. (2022). Practical manual on apiculture, sericulture and lac culture (Hardbound). NPH India.
2. Tamilselvi, M. (2018). A textbook on apiculture. Vijay Nicole Imprints.
3. Belsare, D. K., Singh, R. K., Belsare, S. D., & Deshmukh, R. H. (2019). Textbook of apiculture (beekeeping). Himalaya Publishing House.
4. Jabde, P. V. (2005). Text book of applied zoology: Vermiculture, apiculture, sericulture, lac culture, agricultural pests and their control. Discovery Publishing.

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science			
Programme	B.Voc Agriculture Technology(Honours)			
Course Name	AGRICULTURE WASTE MANAGEMENT			
Type of Course	VAC			
Course Code	MG5VACBAT300			
Course Level	300-399			
Course Summary	Agricultural waste management involves handling, treating, and disposing of waste generated from farming activities to minimize environmental impact and utilize resources effectively. This includes managing manure, crop residues, and other farming-related waste. Key strategies involve reducing waste generation, reusing materials, recycling organic waste into products like compost, and ensuring safe disposal methods.			
Semester	5	Credits		3
Course Details	Learning Approach	Lecture	Practical	OJT
		3	0	
				Total Hours
				45
Pre- requisites, if any	Nil			

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Understand the methods of composting ,waste processing and the types of agricultural wastes	U	1,2,3,4,6, 8,9,10

2	Understand the uses of various microorganisms in agriculture waste management	U	1,2,3,4,6,8,9,10
3	Apply the concept of vermicomposting	A	1,2,3,4,5,6,8,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	1	2	0	2	0	1	1	2
CO 2	2	2	1	2	0	1	0	1	1	2
CO 3	3	3	2	2	1	2	0	1	2	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Agriculture Wastes		18	
	1.1	Source segregation methods -methods of collection and storage of agricultural wastes.	5	1
	1.2	Survey of different agricultural production systems – observe types of wastes generated – quantification and classification of wastes	2	1
	1.3	Methods of waste processing – reporting.	4	1
	1.4	Composting –principles - factors affecting composting	3	1
	1.5	Different methods of composting- aerobic - windrow compost preparation - aerated static	4	1

		pile composting		
2	Composting techniques		12	
	2.1	Preparation of different types of compost --Sheet composting --In vessel composting -- biodynamic composting - pipe composting	5	2
	2.2	Use of micro organisms in composting - Microbial composts --EM compost	3	2
	2.3	Preparation of Coir pith compost - production technologies	4	2
3	Vermicomposting		15	
	3.1	Mass multiplication of earthworms- indoor vermicomposting (small scale) - outdoor vermicomposting (commercial scale)- insitu vermicomposting.	10	3
	3.2	Rapid thermo chemical processing of agricultural wastes Pyrolysis -Biochar production by the process of pyrolysis from organic waste.	5	3
4		Teacher Specific		

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Theory

	<p>C. Continuous Comprehensive Assessment (CCA)</p> <p>Theory Total Marks: 25 Assessment Methods : Oral presentation, Written test, Assignment, In class Discussion</p>
	<p>D. End Semester Evaluation (ESE)</p> <p>Theory Total Marks : 50 Assessment Methods :Written exam Duration of Examination :1.50 hr Pattern of examination for Theory Non-MCQ Different parts of written examination Part A, Part B, Part C Answer Type : Short answer, Short Essays ,Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15)</p>

Syllabus

References

1. Chaudhery, S. A. (2015). Agricultural waste management: Problems, processes and technologies. Nova Science Publishers.
2. Rao, C. S. (2006). Environmental pollution control engineering (2nd ed.). New Age International Publishers
3. Ravindran, R., & Jaiswal, A. K. (2019). A zero waste approach to food waste: Agricultural and food waste utilization. Academic Press.
4. Kumar, S., & Gaikwad, S. A. (2017). Agro-industrial waste utilization and management. Springer.
5. Edwards, C. A., & Bohlen, P. J. (1996). Biology and ecology of earthworms (3rd ed.). Chapman & Hall.

6. Edwards, C. A. (2004). Earthworm ecology (2nd ed.). CRC Press
7. Ismail, S. A. (2005). The earthworm book: The wonder of vermicomposting. Other India Press.

Suggested Readings

1. Pal, D. B., & Tiwari, A. K. (Eds.). (2023). Agricultural and kitchen waste: Energy and environmental aspects (1st ed.). CRC Press.
2. Neelancherry, R., Gao, B., & Wisniewski Jr, A. (Eds.). (2023). Agricultural waste to value-added products: Technical, economic and sustainable aspects. Springer Singapore.
3. Amin, T., Bashir, O., Bhat, S. A., & Malik, M. A. (Eds.). (2022). Integrated waste management approaches for food and agricultural byproducts. Apple Academic Press.
4. Giri, A., Dhull, S. B., Kumar, R., & Acharya, S. (Eds.). (2025). Waste to resources: Unlocking potential applications of agricultural waste. Elsevier.



MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Course Name	PRINCIPLES OF AGRIBUSINESS MANAGEMENT				
Type of Course	MPC				
Course Code	MG5MPCBAT300				
Course Level	300-399				
Course Summary	This course familiarise the fundamentals of information and communication management. It provides a detailed information about the various entrepreneurship strategies.				
Semester	5	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		4	0		
Pre- requisites, if any	Nil				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the role of communication channels	K	1,3,4,5,6,9,10
2	Understand the communication system,types of Business organization and the agricultural information system	U	1,2,3,4,6,9,10
3	Understand the concept of Entrepreneurship Development	U	1,2,3,4,6,9,10

4	Analyse the various phases of EDP and the procedures involved in the development of a business plan and the phases of a project cycle	An	1,2,3,4,5,6,8,9,10
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CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	1	3	1	2	0	0	2	2
CO 2	2	1	2	1	0	1	0	0	1	2
CO 3	2	2	1	2	0	1	0	0	2	1
CO 4	2	1	2	2	1	2	0	1	2	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Information and communication management		16	
	1.1	Fundamentals of information and communication- solving agricultural problems with information systems- a managerial overview of information and communication.	4	1
	1.2	Information-characteristics, Information Vs Knowledge, ABC nature of information, Information as a crucial resource.	5	1
	1.3	Different channels of information - communication- Radio, TV, Video, E-mail, Network connecting devices-intranet, internet, Photography, basics -its use in ICM, Digital	4	1

		Photography -its advantages.		
	1.4	Agricultural Information System - Agricultural databases - Definition and objectives, Decision Support system, Expert system.	3	1
2	Agribusiness Organisations		13	
	2.1	Management of agro based industries. Agribusiness-concept, nature and scope of agribusiness, Business-status present role and future prospects, forms of agribusiness organizations-their advantages and disadvantages.	3	2
	2.2	Understanding entrepreneurship-need for EDP, entrepreneurial process, entrepreneurial traits and competence-dynamics of entrepreneurship.	2	2
	2.3	Agribusiness-concept, nature and scope of agribusiness, Business-status present role and future prospects, forms of agribusiness organizations-their advantages and disadvantages.	4	2
	2.4	Preparing business plan-what is a business plan? Characteristics of a good business plan, elements of business plan, why some plans fail? licensing-government policies and sanction, certification and patent law.	2	2
	2.5	Agribusiness development, steps in setting up a small	2	2

		enterprise analysis of opportunities. Small business management, the process of management, organizing the enterprise.		
3	Marketing Management and Agricultural Projects		12	
	3.1	Concept of marketing management - Marketing - new concept - business marketing - ,holistic marketing - marketing management process.	6	3
	3.2	Marketing mix - Market structure and Consumer buying behavior. Marketing environment-Responding to market environment Marketing opportunities analysis - marketing management tasks, Marketing Planning Process.	6	3
4	Projects		19	
	4.1	New product development process - Challenges in new product development.	5	4
	4.2	Project concept- definitions- project approach to development, Agricultural projects.	4	4
	4.3	Characteristics- relationship of projects with plans and programmes. Phases of project cycle- identification- formulation, appraisal, implementation- monitoring and evaluation	5	4
	4.5	Risk in agricultural projects- methods of handling risk projects	5	4
5		Teacher Specific		

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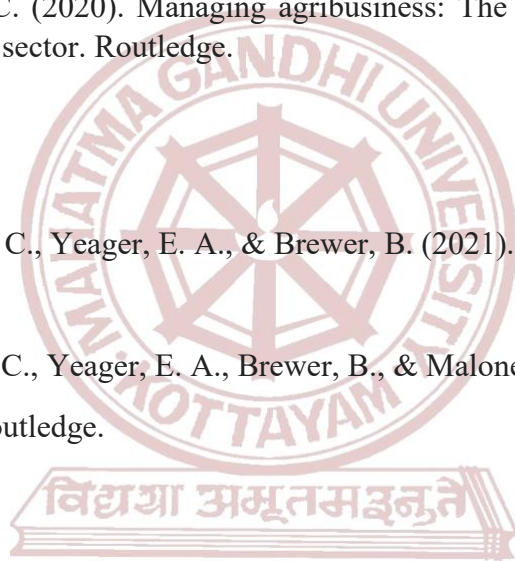
Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	<p>MODE OF ASSESSMENT Both</p> <p>S. Continuous Comprehensive Assessment (CCA)</p> <p>Theory Total Marks: 25 Assessment Methods :Oral presentation,Written test,Assignment,In class discussion</p> <p>Practical Total Marks : 15 Assessment Methods: Viva ,Practical Assignment</p> <p>T. End Semester Evaluation (ESE)</p> <p>Theory Total Marks :70 Assessment Methods : Written exam Duration of Examination: 2 hr. Pattern of examination for Theory: Non-MCQ Different parts of written examination :Part A, Part B, Part C</p> <p>Answer Type :Short answer, short essay, essay Marks for part :2,5,15 Number of questions in each part :12,6,4 Number of questions to be answered :10,4,2</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(10 out of 12)-(10*2=20) Part B-Short Essay-(4 out of 6)-(4*5=20) Part C-Essay-(2out of 4)-(2*15=30)</p>

References

1. Akridge, J. T., & Telfer, S. L. (2015). Agribusiness management (7th ed.). Pearson Education.
2. Hancock, J., & Lattz, M. (2016). Introduction to agribusiness (2nd ed.). Cengage Learning.
3. Cramer, G. L., Jensen, J. D., & Southgate, D. (2016). Agricultural economics and agribusiness (6th ed.). Wiley.
4. Sharma, R. K. (2017). Agribusiness management (1st ed.). Macmillan Publishers India.
5. Baker, L., & Chaddad, F. R. (2019). Agribusiness: Principles of management (2nd ed.). Oxford University Press.
6. Kotler, P., & Armstrong, G. (2017). Principles of marketing (17th ed.). Pearson Education.
7. Dixon, M., & Kieran, C. (2020). Managing agribusiness: The essential guide to business strategy in the agriculture sector. Routledge.

Suggested Readings

1. Barnard, F. L., Foltz, J. C., Yeager, E. A., & Brewer, B. (2021). Agribusiness management (6th ed.). Routledge.
2. Akridge, J. T., Foltz, J. C., Yeager, E. A., Brewer, B., & Malone, T. (2025?). Agribusiness Management (7th ed.). Routledge.



MGU-B.VOC. (HONOURS)

Syllabus



SEMESTER 6

MGU-B.VOC. (HONOURS)

Syllabus

Course Code	Title of the Course	Type of the Course	Credit	Hours/ week	Hour Distribution /week		
					L	P	O
MG6SDEB AT300	COMMUNICATION AND AGRICULTURAL EXTENSION SYSTEM	SDC	4	5	3	2	0
MG6SDEB AT301	FARMING SYSTEM APPROACH FOR SUSTAINABLE CROP PRODUCTION	SDC	4	5	3	2	0
MG6SDCB AT301	DISEASE MANAGEMENT IN COMMERCIAL CROPS	SDC	4	5	3	2	0
MG6SECB AT300	ENTREPRENEURSHIP DEVELOPMENT	SEC	3	3	3	0	0
MG6VAC BAT300	HI TECH AGRICULTURE IoT AND DRONES	VAC	3	3	3	0	0
MG6PRJB AT300	PROJECT	PRJ	4	8	0	8	0
MG6MPC BAT300	ENTREPRENEURSHIP DEVELOPMENT	MPC	4	4	4	0	0

MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science					
Programme	B.Voc Agriculture Technology(Honours)					
Course Name	COMMUNICATION AND AGRICULTURAL EXTENSION SYSTEM					
Type of Course	SDCE					
Course Code	MG6SDEBAT300					
Course Level	300-399					
Course Summary	This course summarizes the important communication skills needed for the students those who work in the agricultural field. It explains the important agricultural extension systems in India					
Semester	6	Credits			4	Total Hours
Course Details	Learning Approach	Lecture	Practical	OJT	60	
		3	1	0		
Pre- requisites, if any	Nil					

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Remember the concept of communication process	R	1,2,3,4,5, 8,9,10
2	Understand the various adoption and innovation processes	U	1,2,3,4,5, 6,9,10

3	Analyse the role of various institution in the extension activities	An	1,2,3,4,5,6,9,10
4	Analyse the role of various channels of communication	An	1,2,3,4,6,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	2	2	2	1	0	0	1	2	2
CO 2	2	2	2	3	2	1	0	0	2	2
CO 3	2	1	2	2	1	2	0	0	3	3
CO 4	2	1	1	1	0	1	0	0	1	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Communication		10	
	1.1	Meaning and definition of communication.	2	1
	1.2	Communication process, elements and models of communication process.	4	1
	1.3	Types of communication. Key communicator, audio-visual aids, their use and effectiveness	4	1
2	Extension Teaching Methods		13	
	2.1	Classification, merits and demerits.	3	2
	2.2	Factors affecting selection and use of extension teaching methods.	5	2
	2.3	Mass media in extension.	5	2

3	Innovation ,Adoption and Decision Process		22	
	3.1	Meaning and definition of innovation, diffusion, adoption, diffusion effect and rate of adoption.	5	3
	3.2	Innovation decision process.	6	3
	3.3	Factors affecting adoption, difference between diffusion and communication.	5	3
	3.4	Categories of adopters, characteristics of innovations. Brief knowledge about KVK, NATP, NAIP, ATMA and Agri clinic.	6	3
4	Practical		30	
	4.1	Preparation of an analysis report on the various communication system	8	4
	4.2	Conduct a case study of extension teaching methods	12	4
	4.3	Brief analysis report on the various extension system such as KVK, NATP, NAIP, ATMA and Agri clinic	10	4
5	Teachers Specific			

Teaching and Learning Approach	MODE OF ASSESSMENT Mode of Assessment Lecture Field visit Seminars Discussion
.Assessment Types	MODE OF ASSESSMENT Both A.Continuous Comprehensive Assessment (CCA)

	<p>Theory Total Marks: 25 Assessment Methods :oral presentation,Written test,Assignment,In class discussion</p> <p>Practical Total Marks : 15 Assessment Methods: Viva ,Practical Assignment</p>
	<p>U. End Semester Evaluation (ESE)</p> <p>Theory Total Marks: 50 Assessment Methods Written Exam Duration of Examination :2 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1</p> <p>Marks for parts:</p> <p>Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical Total Marks: 35 Assessment Methods :Exam-25 Record -5 Viva-5</p> <p>Duration of Examination :1 hr</p>

References

1. Rathakrishnan, T., Thomas, M. I., & Nirmala, L. (2020). Communication Techniques in Farm Extension. Scientific Publishers.
2. Jaisridhar, P., & Surudhi. (2020). Communication Technologies in Agriculture. NIPA.

3. Arya, R., Arya, R. L., Arya, A., Yadav, R. A., & Sachan, P. (2022). Fundamentals of Agricultural Extension. Scientific Publishers.
4. Bansal, V., Meena, N. R., & Somani, L. L. (2021). Textbook of Global Extension Systems. AgroTechBooks.
5. Goswami, A., & Biswas, S. (Eds.). (2023). Advanced Extension & Communication Strategies for Sustainable Livelihood Through Animal Husbandry and Allied Farming System (Vol. 8). NIPA.
6. Somani, L. L. (2024). Extension Education and Communication Management. AgroTechBooks.

Suggested Readings

1. Rathakrishnan, T., Israel Thomas, M., & Nirmala, L. (2020). Communication techniques in farm extension. Scientific Publishers.
2. Jaisridhar, P., & Surudhi, M. (2020). Communication technologies in agriculture. NIPA Publications.
3. Jaisridhar, P., & Surudhi, M. (2025). Communication for development and extension teaching. NIPA Publications.
4. Somani, L. L. (2024). Extension education and communication management. AgroTechBooks.



Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Agriculture Technology					
Programme	B.Voc Agriculture Technology (Honours)					
Course Name	FARMING SYSTEM APPROACH FOR SUSTAINABLE CROP PRODUCTION					
Type of Course	SDCE					
Course Code	MG6SDEBAT301					
Course Level	300-399					
Course Summary	This course Familiarise the various Farming System Approach for Sustainable Crop Production and it creates an idea about different non-traditional practices in organic farming.					
Semester	6	Credits			4	Total Hours
Course Details	Learning Approach	Lecture	Practical	OJT		
Pre-requisites, if any	Nil	3	1	0	75	

MGU-B.VOC. (HONOURS)

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Understand the importance of system approach ,types of farming systems and agroforestry	U	1,2,3,4,6, 8,9,10
2	Apply the idea of integrated farming system in the field to aware the people	A	1,2,3,4,6, 5,8,9,10
3	Analyse the major farming system and the components of integrated	An	1,2,3,4,6, 8,9,10

	farming system		
4	Create a crop plan, crop calendar and an IFS Model	C	1,2,3,4,6,5,8,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	1	2	0	2	0	1	2	2
CO 2	3	3	2	3	2	3	0	2	2	3
CO 3	2	2	1	2	0	2	0	1	2	2
CO 4	2	3	2	2	2	2	0	1	2	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Cropping Systems		15	
	1.1	Importance of system approach in crop production different cropping systems.	2	1
	1.2	Terms and definition- Cropping pattern - Multiple cropping and various forms- advantages and disadvantages.	7	1
	1.3	Intercropping- ecological basis of intercropping systems- types- sequential cropping.	3	1
		Crop rotation-planned crop rotation .Mixed farming and farming systems of Kerala.	3	1
2	Crop Planning		10	
	2.1	Crop planning, crop calendar and cropping scheme preparation- factors affecting cropping schemes.	3	2

	2.2	Plant interactions- Allelopathy, Competition- Measures to minimize competition.	3	2
	2.3	Criteria for assessment of yield advantage, land use efficiency and monitory advantage.	4	2
	Agroforestry and Integrated Farming System		20	
3	3.1	Agro forestry - Silviculture, Agri silviculture, Agri horticulture, Agri silvi pastoral system, Alley cropping, and Social forestry.	5	3
	3.2	Organic recycling in cropping systems. Important cropping systems in India.	2	3
	3.3	Introduction to the practices followed by farmers in “zero budget farming”.	3	3
	3.4	Incorporation of components of Integrated farming system in homestead farming.	5	3
	3.5	Integrated farming system (IFS) models for uplands and low lands for sustainable and organic agriculture- Evaluation of farming systems.	5	3
	Practical		30	
4	4.1	Prepare a Crop plan and Calender	8	4
	4.2	Identify the Plant Interactions and Prepare a Report	6	4
	4.3	Assessment of Yield Advantage	6	4

	4.4	Prepare an IFS model	10	4
5		Teacher Specific		

Teaching and Learning Approach	MODE OF ASSESSMENT Mode of Assessment Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Both V. Continuous Comprehensive Assessment (CCA) Theory Total Marks: 25 Assessment Methods :oral presentation,Written test,Assignment,In class discussion Practical Total Marks : 15 Assessment Methods: Viva ,Practical Assignment

MGU-B.VOC. (HONOURS)

Syllabus

W. End Semester Evaluation (ESE)

Theory

Total Marks: 50

Assessment Methods Written Exam

Duration of Examination :2 hr

Pattern of examination for Theory :Non-MCQ

Different parts of written examination :Part A, Part B, Part C

Answer Type :Short answer, Short Essays, Essays

Marks for part :2,5,15

Number of questions in each part :7,7,2

Number of questions to be answered :5,5,1

Marks for parts:

Part A-Short Answer-(5 out of 7)-(5*2=10)

Part B-Short Essay-(5out of 7)-(5*5=25)

Part C-Essay-(1 out of 2)-(1*15=15)

Practical

Total Marks: 35

Assessment Methods :Exam-25

Record-5

Viva-5

Duration of Examination :1 hr

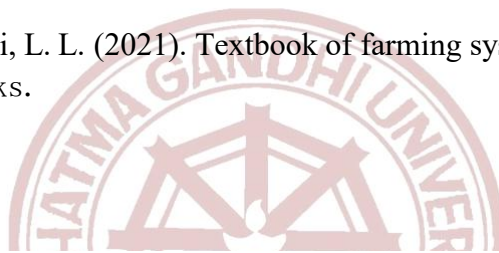
References

1. Altieri, M. A. (2018).Agroecology: The science of sustainable agriculture (3rd ed.). CRC Press.
2. Lichtfouse, E. (Ed.). (2009).Sustainable agriculture (Vol. 1). Springer.
3. Pretty, J. (2008).Sustainable agriculture and food: Four-volume set. Routledge.
4. Willey, R. W., & Rao, M. R. (1980).A systems approach to agriculture: Intercropping and agroforestry. ICRISAT.
5. Rigby, D., Cáceres, D., & Shiel, R. (2001).Farm-level indicators of sustainable agricultural practice: A focus on the agronomic perspective. In: Sustainable agriculture and environment (pp. 195–211). Springer.
6. Vanloon, G. W., Patil, S. G., & Hugar, L. B. (2005).Agroecosystems and the environment: Sources, control and remediation. CRC Press.

7. FAO. (2014). Building a common vision for sustainable food and agriculture: Principles and approaches. Food and Agriculture Organization of the United Nations.

Suggested Readings

1. Verma, S., Mishra, J., Mohapatra, S., Rastogi, M., & Singh, V. (2023). A textbook of integrated farming systems for sustainable agriculture. B. P. International.
2. Walia, S. S., & Walia, U. S. (2025). Farming system and sustainable agriculture (1st ed.). Scientific Publishers.
3. Kumar, S., & Palsaniya, D. R., et al. (2017). Farming systems: Issues & strategies. Satish Serial Publishing House.
4. Choudhary, J., & Somani, L. L. (2021). Textbook of farming systems & sustainable agriculture. AgroTechBooks.





**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Course Name	DISEASE MANAGEMENT IN COMMERCIAL CROPS				
Type of Course	SDC				
Course Code	MG6SDCBAT300				
Course Level	300-399				
Course Summary	This course helps to understand the sustainable disease management strategies in plantation crops and spices. It describes the sustainable disease management strategies in vegetables, fruits and field crops				
Semester	6	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	1		
Pre- requisites, if any	Nil				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Understand the methods of sustainable disease management	U	1,2,3,4,5, 6,8,9,10
2	Understand the diseases of plantation crops, spices fruits and vegetables	U	1,2,3,4,6, 8,9,10
3	Identification of various Plant Diseases	A	1,2,3,4,6, 8,9,10
4	Analyse the diseases of plantation	An	1,2,3,4,6,

	crops, spices fruits and vegetables that exist in the field	8,9,10
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CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	1	2	1	2	0	1	1	2
CO 2	2	2	1	2	0	2	0	2	2	2
CO 3	2	1	1	2	1	1	0	1	2	2
CO 4	2	2	1	2	0	2	0	2	2	2

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Sustainable Disease Management		11	
	1.1	Introduction to sustainable Disease Management in crops, importance and history of crop disease management.	3	1
	1.2	Different strategies of sustainable disease management- Cultural, Biological, Physical, Chemical control methods, Cross protection and Biotechnological methods.	5	1
	1.3	Economic importance - symptoms- causal agents - disease cycle of major plant pathogens.	3	1
2	Plantation Crops and Spices		22	
	2.1	Diseases of plantation crops, Economic importance, symptoms, cause, disease cycle and sustainable management of diseases of: Coconut - Root (wilt) disease, bud rot, leaf rot, stem bleeding, other diseases of unknown etiology in	5	2

		coconut-lethal yellowing.		
	2.2	Rubber - Abnormal leaf fall and powdery mildew Tea- Blister blight - grey blight - and thread blight.	5	2
	2.3	Diseases of Spices, Economic importance, symptoms, cause, disease cycle and sustainable management of diseases of: Black pepper- foot rot and slow wilt, bacterial leaf spot.	5	2
	2.4	Ginger: soft rot, leaf spot, and bacterial wilt.	2	2
	2.5	Cardamom - azhukal/ capsule rot, clump rot and katte.	2	2
	2.6	Economic importance, symptoms, cause, disease cycle and integrated management of diseases of ginger - soft rot- leaf spot and bacterial wilt.	3	2
		Fruits and Vegetable Diseases	12	
3	3.1	Diseases of vegetables and their management Economic importance, symptoms, cause, disease cycle and sustainable management of diseases of solanaceous vegetables ,bhindi , vegetable cowpea and cucurbits.	4	3
	3.2	Diseases of fruits and their management Economic importance, symptoms, cause, disease cycle and integrated management of diseases of Banana: Viral Diseases-Bunchy top, Mosaic, heart rot and Kokkan. Post -harvest diseases- Anthracnose, crown rot and cigar end rot.	4	3

	3.3	Mango- mango malformation, anthracnose, powdery mildew, die back, pink disease, sooty mould, blacktip.	4	3
4	Practical		30	
	4.1	Identification of Diseases of Coconut	6	4
	4.2	Identification of Diseases of Spices	6	4
	4.3	Identification of Diseases of Fruits and Vegetables	8	4
	4.4	Field visits, survey and collection of disease samples and their preservation	10	4
5	Teacher Specific			

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Both
	X. Continuous Comprehensive Assessment (CCA) Theory Total Marks: 25 Assessment Methods :oral presentation,Written test,Assignment,In class discussion Practical Total Marks : 15 Assessment Methods: Viva ,Practical Assignment
	Y. End Semester Evaluation (ESE) Theory

	<p>Total Marks: 50 Assessment Methods Written Exam Duration of Examination :2 hr Pattern of examination for Theory :Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, Short Essays, Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1 Marks for parts:</p> <p>Part A-Short Answer-(5 out of 7)-(5*2=10) Part B-Short Essay-(5out of 7)-(5*5=25) Part C-Essay-(1 out of 2)-(1*15=15)</p> <p>Practical Total Marks: 35 Assessment Methods :Exam-25 Record-5 Viva-5 Duration of Examination :1 hr</p>
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References

1. Agrios, G. N. (2005).Plant pathology (5th ed.). Elsevier Academic Press.
2. Thind, T. S. (Ed.). (2005).Disease management of fruits and vegetables: Volume 1 – Fruit crops. Kalyani Publishers.
3. Thind, T. S. (Ed.). (2006).Disease management of fruits and vegetables: Volume 2 – Vegetable crops. Kalyani Publishers.
4. Narayanasamy, P. (2011).Microbial plant pathogens and crop disease management. Oxford & IBH Publishing.
5. Rangaswami, G., & Mahadevan, A. (2010).Diseases of crop plants in India (4th ed.). Prentice-Hall of India.
6. Strange, R. N. (2003).Introduction to plant pathology. John Wiley & Sons.
7. Kohli, M. M. (Ed.). (2003).Integrated plant disease management. Researchco Book Centre.

Suggested Readings

1. Bahadur, A., & Dutta, P. (Eds.). (2024). Diseases of commercial crops and their integrated management. CRC Press.
2. Sahni, S., Thapa, G., & Prasad, B. D. (Eds.). (2024). New advances in crop disease management. Apple Academic Press.
3. Plant Disease Management Strategies for Sustainable Agriculture through Traditional and Modern Approaches (2020)
4. Singh, V. K., Akhtar, J., & Singh, K. P. (Eds.). (2024). Diseases of field crops: Diagnostics and management. Springer.



MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	ENTREPRENEURSHIP DEVELOPMENT				
Type of Course	SEC				
Course Code	MG6SECBAT300				
Course Level	300-399				
Course Summary	This course helps to understand the the students about Agri entrepreneurs and different classifications and general awareness about identification of project financing new enterprises.				
Semester	6	Credits		3	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	0	0	
Pre- requisites, if any	NIL				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Understand the concept of entrepreneurship ,project report and the the various legal entities associated with it	U	1,2,3,4,5, 6,7,9,10
2	Apply the format of project report	A	1,2,3,4,5,

	during project preparation		6,9,10
3	Analyse the format of a project report	An	1,2,3,4,5,6,9,10
4	Analyse the role of various organisation in entrepreneurship development	An	1,2,3,4,5,6,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	2	3	3	2	1	0	3	3
CO 2	3	3	2	2	2	2	0	0	3	3
CO 3	1	2	2	3	1	1	0	0	2	3
CO 4	2	2	2	3	3	2	0	0	3	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Entrepreneur and Entrepreneurship		6	
	1.1	Entrepreneur and entrepreneurship - Definition; traits and features; classification.	2	1
	1.2	Women entrepreneurs	2	1
	1.3	Role of entrepreneur in Entrepreneurs in India.	2	1
2	General awareness about identification of project financing new enterprises. Promotion		14	
	2.1	General awareness about identification of project financing new enterprises.	4	2

		Promotion of a venture; opportunity Analysis.		
	2.2	Project identification and selection; External environmental analysis economic, social, technological a competitive factor; Legal requirements for establishment of a new unit; loans; Overrun finance; Bridge finance; Venture capital; Providing finance in Approaching financing institutions for loans.	10	2
	Business Opportunities		20	
	3.1	To identify different business opportunities, Discuss opportunities in small business. Sickness in small business enterprise causes and remedies.	5	3
	3.2	Formalities for setting up of a small business enterprise.	5	3
3	3.3	Institutions supporting small business enterprise - EDII (Entrepreneurship Development Institute of India) SLDO (Small Industries Development Organization NSIC (National small Industries Corporation Ltd. (CNSIC) NIESBUD (National Institute for Entrepreneurship and small Business Development.	10	3
4		Teachers Specific		

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Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Theory E. Continuous Comprehensive Assessment (CCA) Theory Total Marks:25 Assessment Methods :Oral presentation,Written test,Assignment,In class discussion F. End Semester Evaluation (ESE) Theory Total Marks : 50 Assessment Methods :Written exam Duration of Examination :1.50 hr Pattern of examination for Theory:Non-MCQ Different parts of written examination Part A, Part B, Part C Answer Type Short answer, Short Essays,Essays Marks for part :2,5,15 Number of questions in each part :7,7,2 Number of questions to be answered :5,5,1 Marks for parts:

	<p>Part A-Short Answer-(5 out of 7)-(5*2=10)</p> <p>Part B-Short Essay-(5out of 7)-(5*5=25)</p> <p>Part C-Essay-(1 out of 2)-(1*15=15)</p>
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References

1. Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2017). *Entrepreneurship* (10th ed.). McGraw-Hill Education.
2. Kuratko, D. F. (2016). *Entrepreneurship: Theory, process, and practice* (10th ed.). Cengage Learning.
3. Taneja, S., & Gupta, S. L. (2020). *Entrepreneurship development*. Galgotia Publishing Company.
4. Desai, V. (2009). *Dynamics of entrepreneurial development and management* (5th ed.). Himalaya Publishing House.
5. Lall, M., & Sahai, S. (2008). *Entrepreneurship*. Excel Books.
6. Khanka, S. S. (2006). *Entrepreneurial development* (Reprint ed.). S. Chand Publishing.
7. Scarborough, N. M. (2016). *Essentials of entrepreneurship and small business management* (8th ed.). Pearson Education.

Suggested Readings

1. Ojha, P. K. (2025). *Entrepreneurship development in agriculture*. Content Vibes.
2. Panigrahy, S. R., & Singh, B. (2017). *Agro- Enterprenurship*. Scientific Publishers.
3. Raimi, L., Olatidoye, O. P., & Hj Said, T. F. (Eds.). (2024). *Agriprenurship and the dynamic agribusiness value chain*. Springer Singapore.
4. Sharma, M. C. (2019). *Entrepreneurship in livestock & agriculture*. CBS Publishers & Distributors.



Mahatma Gandhi University
Kottayam

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology (Honours)				
Course Name	HI TECH AGRICULTURE IoT AND DRONES				
Type of Course	VAC				
Course Code	MG6VACBAT300				
Course Level	300				
Course Summary	This course familiarise the Hi-tech agriculture and its benefits and Role of IoT and drones in modern agriculture.				
Semester	6	Credits		3	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		3	0	0	
Pre- requisites, if any	NIL				

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
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1	Understand the concept of Hi-Tech agriculture	U	1,2,3,4,5,6,7,9,10
2	Understand the concept of IoT and Drones	U	1,2,3,4,5,6,7,9,10
3	Apply the concept of IoT in modern agricultural system	A	1,2,3,4,5,6,7,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	3	3	2	3	2	2	0	3	3
CO 2	2	3	3	2	3	2	1	0	3	3
CO 3	2	3	3	2	3	2	2	0	3	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Introduction to Hi-Tech Agriculture		10	
	1.1	Overview of Hi-tech agriculture and its benefits.	3	1
	1.2	Role of IoT and drones in modern agriculture.	4	1
	1.3	Future trends and opportunities in hi-tech agriculture.	3	1
2	IoT in Agriculture		14	
	2.1	Introduction to IoT and its applications in agriculture.	3	2
	2.2	Sensors and devices used in agricultural IoT (e.g., soil moisture, temperature,	5	2

		humidity).		
	2.3	Data collection and analysis for informed decision-making.	6	2
3	Drones in Agriculture		21	
	3.1	Introduction to drones and their applications in agriculture.	5	3
	3.2	Types of drones and their uses (e.g., crop monitoring, spraying, mapping).	8	3
	3.3	Drone technology and components (e.g., cameras, sensors, GPS).	8	3
4		Teachers Specific		

Teaching and Learning Approach	<p>Classroom Procedure (Mode of transaction)</p> <p>Lecture Field visit Seminars Discussion</p>
Assessment Types	<p>MODE OF ASSESSMENT</p> <p>Theory</p>
	<p>G. Continuous Comprehensive Assessment (CCA)</p> <p>Theory</p> <p>Total Marks:25</p> <p>Assessment Methods :Oral presentation,Written test,Assignment,In class discussion</p>

H. End Semester Evaluation (ESE)

Theory

Total Marks : 50

Assessment Methods :Written exam

Duration of Examination :1.50 hr

Pattern of examination for Theory:**Non-MCQ**

Different parts of written examination Part A, Part B, Part C

Answer Type Short answer, Short Essays,Essays

Marks for part :2,5,15

Number of questions in each part :7,7,2

Number of questions to be answered :5,5,1

Marks for parts:

Part A-Short Answer-(5 out of 7)-(5*2=10)

Part B-Short Essay-(5out of 7)-(5*5=25)

Part C-Essay-(1 out of 2)-(1*15=15)

References

1. Zhang, Q. (Ed.). (2021).Smart agriculture: An approach towards better agriculture management. Springer.
2. Sharma, H. K., & Kumar, A. (Eds.). (2020).Internet of Things (IoT) in agriculture: Recent advances and future trends. CRC Press.
3. Chlingaryan, A., Sukkarieh, S., & Whelan, B. (2018).Machine learning approaches for crop yield prediction and nitrogen status estimation in precision agriculture: A review. Computers and Electronics in Agriculture, 151, 61–69.
4. Patel, K. K., Patel, D. K., & Patel, P. R. (2021).Internet of Things and data analytics handbook for agriculture. CRC Press.
5. Crane, M., & Kinane, J. (2021).Drones in agriculture: Technology, practices, and legal considerations. CABI.
6. Matese, A., & Di Gennaro, S. F. (2018).Technology in precision viticulture: A state of the art review. Sensors, 18(2), 473.

Suggested Readings

1. Subramanian, K. S. (2022). Drones in Digital Agriculture. Astral International Pvt Ltd.
2. Krishna, K. R. (2018). Agricultural Drones: A Peaceful Pursuit (1st ed.). Apple Academic Press.
3. Krishna, K. R. (2021). Push Button Agriculture: Robotics, Drones, Satellite-Guided Soil and Crop Management (1st ed.). Apple Academic Press.
4. Singh Chouhan, S., Pratap Singh, U., & Jain, S. (Eds.). (approx. 2024). Applications of Computer Vision and Drone Technology in Agriculture 4.0. Springer.



MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Course Name	Project				
Type of Course	PRJ				
Course Code	MG6PRJBAT300				
Course Summary	<p>The project work provides students with an opportunity to identify, analyze, and solve real-world problems relevant to their field of study by integrating and applying the theoretical knowledge and skills acquired throughout their academic program. It fosters independent research, critical thinking, innovation, and the practical use of methodologies, tools, and techniques to design effective solutions. Students are encouraged to work individually or in teams, enhancing their collaboration, time management, ethical responsibility, and self-directed learning. The project also develops competencies in academic writing, documentation, and technical communication. Each project is expected to culminate in a comprehensive report, a working model or prototype (where applicable), and a formal presentation followed by a viva voce examination, demonstrating the student's ability to apply knowledge creatively and professionally in a real-world context.</p>				
Semester	6	Duration	8 hours/week	Credits	4

COURSE OUTCOMES (CO)

CO	Expected Course Outcome	Learning Domains	PO No:
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No:			
	Upon the successful completion of the course, the student will be able to		
1	Identify, analyze, and define problems relevant to the field of study.	An	1,2,3
2	Apply appropriate methodologies, tools, and techniques to design and implement effective solutions.	C	2,3,10
3	Demonstrate skills in research, critical thinking, project planning, and systematic execution.	S	1,2,5,10
4	Produce well-structured academic reports and communicate project outcomes effectively.	S	4,8,10
5	Exhibit teamwork, time management, ethical responsibility, and initiative in a self-directed project environment.	S	5,8,9,10
6	Address real-world challenges with innovative and context-aware solutions.	Ap	1,2,6,10
<i>*Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)</i>			

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	1	0	0	0	0	0	0	0
CO 2	0	2	1	0	0	0	0	0	0	2
CO 3	2	1	0	0	1	0	0	0	0	2
CO 4	0	0	0	2	0	0	0	2	0	2
CO 5	0	0	0	0	2	0	0	1	2	2
CO 6	2	2	0	0	0	2	0	0	0	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

MODE OF ASSESSMENT		
A	Internal Evaluation	
	Components	Marks
	Commitment and Involvement	5

Assessment Types		Periodic progress review	10
		Quality of work/Implementation effort	10
		Report	5
		Total	30
	B	External Evaluation	
		Components	Marks
		Problem Identification and Objectives	10
		Methodology / Design / Technical Content	15
		Implementation / Analysis / Results	15
		Final Report	10
	Presentation	10	
	Viva Voce	10	
	Total	70	

MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Faculty/ Discipline	Science				
Programme	B.Voc Agriculture Technology(Honours)				
Course Name	ENTREPRENEURSHIP DEVELOPMENT				
Type of Course	MPC				
Course Code	MG6MPCBAT300				
Course Level	300-399				
Course Summary	This course helps to understand the the students about Agri entrepreneurs and different classifications and general awareness about identification of project financing new enterprises.				
Semester	6	Credits		4	
Course Details	Learning Approach	Lecture	Practical	OJT	Total Hours
		4	0	0	
Pre- requisites, if any	NIL				

Syllabus

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Understand the concept of entrepreneurship ,project report and the the various legal entities associated with it	U	1,2,3,4,5, 6,7,9,10
2	Apply the format of project report	A	1,2,3,4,5,

	during project preparation		6,9,10
3	Analyse the format of a project report	An	1,2,3,4,5,6,9,10
4	Analyse the role of various organisation in entrepreneurship development	An	1,2,3,4,5,6,9,10

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	2	3	3	2	1	0	3	3
CO 2	3	3	2	2	2	2	0	0	3	3
CO 3	1	2	2	3	1	1	0	0	2	3
CO 4	2	2	2	3	3	2	0	0	3	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1	Entrepreneur and Entrepreneurship		14	
	1.1	Entrepreneur and entrepreneurship - Definition; traits and features; classification.	4	1
	1.2	Women entrepreneurs	5	1
	1.3	Role of entrepreneur in Entrepreneurs in India.	4	1
2	General awareness about identification of project financing new enterprises. Promotion		18	
	2.1	General awareness about identification of project financing new enterprises.	8	2

		Promotion of a venture; opportunity Analysis.		
	2.2	Project identification and selection; External environmental analysis economic, social, technological a competitive factor; Legal requirements for establishment of a new unit; loans; Overrun finance; Bridge finance; Venture capital; Providing finance in Approaching financing institutions for loans.	10	2
	Business Opportunities		16	
3	3.1	To identify different business opportunities, Discuss opportunities in small business. Sickness in small business enterprise causes and remedies.	8	3
	3.2	Formalities for setting up of a small business enterprise.	8	3
	Institutions supporting small business enterprise		12	
4	4.1	Institutions supporting small business enterprise - EDII (Entrepreneurship Development Institute of India) SLDO (Small Industries Development Organization	6	4
	4.2	NSIC (National small Industries Corporation Ltd. (CNSIC) NIESBUD (National Institute for Entrepreneurship and small Business	6	4

		Development.		
5		Teachers Specific		

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Lecture Field visit Seminars Discussion
Assessment Types	MODE OF ASSESSMENT Theory I. Continuous Comprehensive Assessment (CCA) Theory Total Marks:30 Assessment Methods :Oral presentation,Written test,Assignment,In class discussion J. End Semester Evaluation (ESE) Theory Theory Total Marks :70 Assessment Methods : Written exam Duration of Examination: 2 hr. Pattern of examination for Theory: Non-MCQ Different parts of written examination :Part A, Part B, Part C Answer Type :Short answer, short essay, essay Marks for part :2,5,15 Number of questions in each part :12,6,4 Number of questions to be answered :10,4,2 Marks for parts:

	<p style="text-align: center;">Part A-Short Answer-(10 out of 12)-(10*2=20)</p> <p style="text-align: center;">Part B-Short Essay-(4 out of 6)-(4*5=20)</p> <p style="text-align: center;">Part C-Essay-(2out of 4)-(2*15=30)</p>
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References

- 1.Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2017).Entrepreneurship (10th ed.). McGraw-Hill Education.
- 2.Kuratko, D. F. (2016).Entrepreneurship: Theory, process, and practice (10th ed.). Cengage Learning.
- 3.Taneja, S., & Gupta, S. L. (2020).Entrepreneurship development. Galgotia Publishing Company.
- 4.Desai, V. (2009).Dynamics of entrepreneurial development and management (5th ed.). Himalaya Publishing House.
- 5.Lall, M., & Sahai, S. (2008).Entrepreneurship. Excel Books.
- 6.Khanka, S. S. (2006).Entrepreneurial development (Reprint ed.). S. Chand Publishing.
- 7.Scarborough, N. M. (2016).Essentials of entrepreneurship and small business management (8th ed.). Pearson Education.

Suggested Readings

1. Ojha, P. K. (2025). Entrepreneurship development in agriculture. Content Vibes.
2. Panigrahy, S. R., & Singh, B. (2017). Agro- Enterprenurship. Scientific Publishers.
- 3.Raimi, L., Olatidoye, O. P., & Hj Said, T. F. (Eds.). (2024). Agriprenurship and the dynamic agribusiness value chain. Springer Singapore.
- 4.Sharma, M. C. (2019). Entrepreneurship in livestock & agriculture. CBS Publishers & Distributors.



SEMESTER 7 & 8

MGU-B.VOC. (HONOURS)

Syllabus

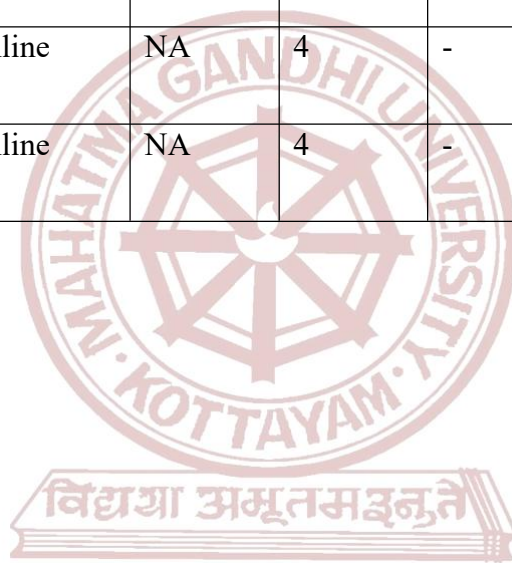
Course Code	Title of the Course	Type of the Course	Credit	Hours/ week	Hour Distribution /week		
					L	P	O
MG7APPBAT400	Apprenticeship	Apprenticeship	28	280 days	0	28	0
MG8RINBAT400	Research Internship	Internship	20	200 days	0	20	0



MGU-B.VOC. (HONOURS)

Syllabus

B.Voc Honours							
Course Code	course	Methodology	Number of days	Credits	Hour Distribution		
					L	P	O
MG7AP PBAT40 0	APP	Apprenticeship	280	28	0	0	28
NA	MPC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-



MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Course Name	Apprenticeship
Type of Course	APP
Course Code	MG7APPBAT400
Summary	<p>As an integral component of the B.Voc. Honours degree programme, students are required to complete a structured apprenticeship or work-integrated learning programme in collaboration with relevant industries, organizations, or institutions. This component, spanning a duration of 280 days, carries 28 academic credits and is compulsory in the student's designated skill domain. It is designed to enhance industry preparedness by reinforcing academic knowledge through sustained, domain-relevant practical experience.</p> <p>The apprenticeship offers students the opportunity to engage directly with real-world professional environments, enabling them to apply domain-specific competencies, gain exposure to industry-standard tools and practices, and participate meaningfully in ongoing operations and projects. This extended, immersive experience serves to bridge the gap between theoretical learning and professional expectations, thereby fostering critical skills for career development and employability.</p> <p>To ensure the effectiveness, academic relevance, and accountability of the apprenticeship:</p> <ul style="list-style-type: none"> ● Each student will be assigned an academic mentor from the parent institution and an industry supervisor from the host organization. ● Students are required to maintain a weekly activity logbook, which must be regularly reviewed and signed by the industry supervisor. ● Monthly progress reports will be submitted to and reviewed by the academic mentor in consultation with the industry supervisor. ● Mid-term and final evaluations will be conducted based on a combination of employer feedback, student outputs/deliverables, and academic performance metrics. ● The institution will conduct site visits, virtual check-ins, or regular follow-ups to ensure student engagement, address issues promptly, and uphold the quality of the apprenticeship experience. <p>This structured apprenticeship is a critical step in preparing students for the dynamic demands of the professional world, ensuring that their academic</p>

	journey culminates in a well-rounded and industry-aligned skill set.				
Semester	7&8	Duration	280 days	Credits	28

COURSE OUTCOMES (CO)

CO No:	Expected Course Outcome	Learning Domains	PO No:
	Upon the successful completion of the course, the student will be able to		
1	Gain hands-on professional experience by engaging in long-term, domain-specific apprenticeship in real-world industry environments.	S	1,3,6,10
2	Apply domain-specific theoretical knowledge to solve real-time problems, enhancing technical and problem-solving competencies.	A	1,2,3,10
3	Demonstrate professional competencies such as workplace etiquette, communication skills, and teamwork in a collaborative work culture.	S	4,5,8,9
4	Build a professional portfolio by achieving practical outcomes and establishing credible industry references and credentials.	C	5,9,10
5	Cultivate reflective thinking, adaptability, and a lifelong learning mindset through structured and mentored work experience.	Ap	1,6,8,10
6	Transition smoothly from academic study to professional practice by developing job-specific skills and industry-aligned competencies.	S	2,3,5,10
<i>Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)</i>			

CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	0	1	0	0	2	0	0	0	2
CO 2	1	2	1	0	0	0	0	0	0	2
CO 3	0	0	0	2	2	0	0	2	1	3
CO 4	0	0	0	0	3	0	0	0	0	2
CO 5	2	0	0	0	0	2	0	1	0	2
CO 6	0	2	2	0	2	0	0	0	0	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Assessment Types	MODE OF ASSESSMENT	
	A	Internal Evaluation
	Components	Marks
	Commitment, Punctuality & Professional Conduct	20
	Monthly Progress Reviews & Logbook Maintenance	25
	Skill Development & Application	25
	Intern Report	20
	Total	90
	B	External Evaluation
	Components	Marks
Feedback & Evaluation Report from Host Organization	50	
Skill Demonstration / Summary of Work Exposure	40	
Final Report / Learning Portfolio	40	
Domain Knowledge and Experience Communication (Presentation)	40	
Viva Voice	40	
Total	210	

MGU B.VOC. (HONOURS)

Syllabus

B.Voc Honours with Research							
Course Code	course	Methodology	Number of days	Credits	Hour Distribution		
					L	P	O
MG8RI NBAT40 0	RIN	Research Internship	20	20	0	0	20
NA	SDC	Online	NA	4	-	-	-
NA	SDC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-
NA	MPC	Online	NA	4	-	-	-



MGU-B.VOC. (HONOURS)

Syllabus



**Mahatma Gandhi University
Kottayam**

Course Name	Research Internship				
Type of Course	RIN				
Course Code	MG8RINBAT400				
Summary	<p>As an integral requirement of the B.Voc. Honours with Research degree programme, the Research Internship is designed to provide students with hands-on exposure to real-world research practices in their designated skill domain. This component carries 20 academic credits and extends over a duration of 200 days. The internship must be undertaken in collaboration with a research organization, industry, or university department, under the mentorship of a qualified research guide.</p> <p>The primary aim of this internship is to engage students in industry-linked research projects that allow them to apply theoretical knowledge to practical, domain-specific problems. Students are expected to work on meaningful research inquiries, contribute to data collection and analysis, develop critical thinking and problem-solving skills, and enhance their communication and documentation abilities. In addition to the research internship, students must earn 8 credits through Skill Development Courses (SDCs), specifically chosen for their research orientation, thereby reinforcing their academic and practical foundation.</p> <p>This component not only contributes significantly to the academic rigor of the Honours with Research degree but also ensures a seamless transition from classroom learning to workplace research, preparing students for advanced studies or professional roles in their respective domains.</p>				
Semester	7&8	Duration	200 days	Credits	20

COURSE OUTCOMES (CO)

CO No:	Expected Course Outcome	Learning Domains	PO No:
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	Upon the successful completion of the course, the student will be able to		
1	Demonstrate research aptitude and inquiry-based learning by actively engaging in real-time research projects.	S	1,2,10
2	Apply academic knowledge in a professional research environment to bridge the gap between theory and real-world research practices.	A	2,3,6,10
3	Strengthen domain-specific knowledge and technical competencies through systematic investigation and practical application.	S	1,2,3
4	Address real-world research problems using problem-solving, analytical, and critical thinking skills.	S	1,2,6
5	Communicate scientific ideas and findings effectively through research reports, documentation, and presentations.	S	4,8,10
6	Collaborate with researchers and peer groups to gain exposure to interdisciplinary perspectives and collaborative learning practices.	S	2,3,5,10
7	Demonstrate professional growth and readiness for higher education, entrepreneurship, or research-oriented careers.	I	5,9,10
<i>Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)</i>			

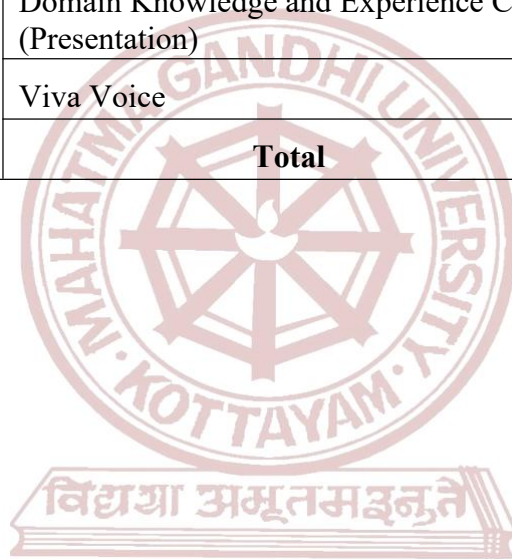
CO-PO ARTICULATION MATRIX

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	0	0	0	0	0	0	0	3
CO 2	0	2	1	0	0	2	0	0	0	2
CO 3	1	2	1	0	0	0	0	0	0	0
CO 4	0	0	0	2	0	0	0	2	0	2
CO 5	0	2	2	0	2	0	0	0	0	2
CO 6	0	0	0	0	2	0	0	0	2	3

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level)

	MODE OF ASSESSMENT									
	A	Internal Evaluation								
Assessment		<table border="1"> <thead> <tr> <th>Components</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>Commitment, Punctuality & Professional Conduct</td> <td>10</td> </tr> <tr> <td>Monthly Progress Reviews & Logbook Maintenance</td> <td>15</td> </tr> <tr> <td>Skill Development & Application</td> <td>15</td> </tr> </tbody> </table>	Components	Marks	Commitment, Punctuality & Professional Conduct	10	Monthly Progress Reviews & Logbook Maintenance	15	Skill Development & Application	15
	Components	Marks								
	Commitment, Punctuality & Professional Conduct	10								
	Monthly Progress Reviews & Logbook Maintenance	15								
Skill Development & Application	15									

Types		Interim Report	20
		Total	60
	B	External Evaluation	
		Components	Marks
		Feedback & Evaluation Report from Host Organization	40
		Skill Demonstration / Summary of Work Exposure	20
		Final Report / Learning Portfolio	25
		Domain Knowledge and Experience Communication (Presentation)	25
		Viva Voice	30
		Total	140



MGU-B.VOC. (HONOURS)

Syllabus

Syllabus Revision workshop participants

1. Ms. Nithya Krishnan

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5. Ms. Nithymol Sunny

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Syllabus