

Revised Syllabi
of
B.B.A. (Agri.)
(Bachelor of Business Administration-Agriculture)

MPKV, RAHURI

2008 - 09

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I. Departmentwise courses of B.B.M. (Agri.)

1. Department of Agricultural and Allied Sciences

AGRO-111	Agro-Techniques of Principal Crops and Agro-Meteorology	3=2 +1
AGRO-122	Sustainable Agriculture and Farming System	2=2+0
	Total	5=4+1
HORT- 111	Production Management of Fruit Crops	2= +1
HORT-232	Production Management of Vegetable and Floricultural Crops	2=1+1
HORT-243	Post Harvest Technology of Horticultural Crops	3=2+1
	Total	7=4+3
BOT-111	Principles of Plant Biotechnology	2=1+ 1
BOT-122	Environmental Science	2=1+1
	Total	4=2+2
SSAC-121	Soil Fertility, Fertilizers and Nutrient Management	2=1+1
SSAC-232	Soil, Water and Plant analysis	2=0+2
	Total	4=1+3
ASDS- 231	Animal Production Management	2=1+1
ASDS-242	Value Addition in Animal Products	2=1+1
	Total	4=2+2
IWM-231	Irrigation Water Management	2=1+1
	Total	2=1+1
ENGG-121	Farm Structures, Machinery and Green House Technology	2=1+1
ENGG-232	Post-Harvest Technology of Cereals, Pulses and Oilseeds	2=1+1
	Total	4=2+2
ENTO- 121	Integrated Pest Management	2=1+1
	Total	2=1+1
PATH-231	Integrated Disease Management	2=1+1
PATH-362	Bio-fertilizers and Mushroom production	2=1+1
	Total	4=2+2
EXTN-121	Dimensions of Agricultural Extension	2=1+1
	Total	2=1+1
STAT-241	Business Statistics	3=2+1
	Total	3=2+1
	Grand Total	41=22+19

2. Department of Agricultural Economics

ECON- 111	Agricultural Economics and Natural Resource Economics	3=2+ 1
ECON- 112	Structure and Dynamics of Indian Agriculture	2=2+ 0
ECON-123	Farm Business Management	2=1+1
ECON-124	Money and Banking	2=1+1
ECON-235	Agril. Co-operation, Institutions and Management	3=2+1
ECON- 246	Scientific Methods in Report Writing	2=1+1
ECON-357	Indian Agriculture Policies	2=2+0
ECON-358	Input-Out-put Measurement Techniques	2=1+1
ECON-369	Planning, Formulation and Evaluation of Business Projects	3=1+2
ECON-3610	Financial Management in Agri-Business	3=2+1
	Total	24=15+9

3. Department of Agricultural Marketing

MKT-121	Introduction to Agricultural Marketing	2=1+1
MKT-232	Marketing Institutions and Organizations	3=2+1
MKT-243	Input Marketing Management	3=2+1
MKT-244	Rural Marketing and Market Infrastructure	3=2+1
MKT-245	Consumer Behaviour	2=1+1
MKT-356	Retail Marketing	3=2+1
MKT-357	Trading of Agricultural Commodities-I	2=1+1
MKT-358	Market and Trade Acts	2=2+0
MKT-369	Trading of Agricultural Commodities-II	2=1+1
MKT-3610	Market Led Extension	2=1+1
	Total	24=15+9
	Compulsory Module*	
MKT-4711	Marketing of Agricultural Products	10=0+10
MKT-4712	Marketing of Agricultural Inputs	10=0+10
	Optional Module**	
MKT-4713	Agricultural Export Procedure and EXIM Policies	3=0+3
MKT-4714	Demand Forecasting, Price Analysis and Future Trading.	3=0+3
MKT-4715	Supply Chain Management (SCM)	3=0+3
MKT-4716	Retail Management of Agricultural Products	2=0+2
MKT-4717	Marketing of Aromatic, Medicinal Plants and Spices.	2=0+2
MKT-4718	Management of Kiosks	2=0+2
MKT-4719	Marketing of Organically Produced Commodities	2=0+2

4. Department of Agri-Business Management

ABM- 111	Introduction to Agri-Business Management	2=1 +1
ABM-112	Agro-based Industrialization	2=2+ 0
ABM 123	Entrepreneurship and Personality Development	2=2+ 0
ABM-234	Communication Skill for Business Management	2=1+1
ABM-245	Agri-Business Operations, HRD and Strategic Management	2=2+0
ABM-246	Information Technology in Agri- business	2=1+1
ABM-247	Office Procedures for Agri-Business	1=0+1
ABM-358	Inventory and Risk Management	2=1+1
ABM-359	Agro-tourisum	2=1+1
ABM-3510	Production Management, Planning and Control	2=1+1
ABM- 3511	Agro Processing Managements	2=1+1
ABM-3512	Marketing and Management Policies	2=1+1
ABM-3613	Product Promotion Methods	2=1+1
ABM-3614	Organizational Behaviour	2=2+0
ABM-3615	Managerial Accounting	2=1+1
ABM-3616	Market Survey and Price Analysis	2=0+2
	Total	31=18+13
	Compulsory Module*	

ABM-4717	Production and Marketing of Crops Produced under Protected Cultivation	10=0+10
ABM-4718	Commercial Production of Livestock Units	10=0+10
ABM-4719	Processing and Value Addition of Fruits and Vegetables	10=0+10
ABM-4720	Commercial Production of Seed	10=0+10
ABM-4721	Commercial Management of Nursery	10=0+10
ABM-4722	Extension Techniques for Transfer of Technology	10=0+10
ABM-4723	Study and Management of Agrotourism Centres	10=0+10
	Optional Module**	
ABM-4724	Management of Agro-Service Centres	3=0+3
ABM-4725	Agricultural Finance Proposals and Management	2=0+2
ABM-4726	Group Sale Management	2=0+2
ABM-4727	Contract Farming Management	2=0+2
ABM-4728	Natural Resources, Economics and Market Management	2=0+2
ABM-4729	Project Formulation, Evaluation and Monitoring	2=0+2
EXTN-472	Agricultural Journalism	3=0+3

* Ten credits to be completed from any one module.

** Ten credits to be completed by combing different optional courses.

II. Odd and even semesterwise layout of B.B.M. (Agri.)

1. Department of Agricultural and Allied Sciences

Semester	Course No.	Title of Course	Credits	Semester	Course No.	Title of Course	Credits
Agronomy							
I	AGRO-111	Agro-Techniques of Principal Crops and Agro-Meteorology	3=2+1	II	AGRO-122	Sustainable Agriculture and Farming System	2=2+0
Horticulture							
I	HORT-111	Production Management of Fruit Crops	2=1+1	II		NIL	
III	HORT-232	Production Management of Vegetable and Floricultural Crops	2=1+1	IV	HORT-243	Post Harvest Technology of Horticultural crops	3=2+1
Botany							
I	BOT-111	Principles of Plant Biotechnology	2=1+1	II	BOT-122	Environmental Science	2=1+1
Soil Science and Agril. Chemistry							
I		NIL		II	SSAC-121	Soil Fertility, Fertilizers and Nutrient Management	2=1+1
III	SSAC-232	Soil, Water and Plant analysis	2=0+2	IV		NIL	
Animal Science and Dairy Science							
III	ASDS-231	Animal Production Management	2=1+1	IV	ASDS-242	Value Addition in Animal Products	2=1+1

Semester	Course No.	Title of Course	Credits	Semester	Course No.	Title of Course	Credits
Irrigation Water Management							
III	IWM-231	Irrigation Water Management	2=1+1	IV		NIL	
Agril. Engineering							
I		NIL		II	ENGG-121	Farm Structures, Machinery and Green House technology	2=1+1
III	ENGG-232	Post-Harvest Technology of Cereals, Pulses and Oilseeds	2=1+1	IV		NIL	
Entomology							
I		NIL		II	ENT-121	Integrated Pest Management	2=1+1
Pathology							
III	PATH-231	Integrated Disease Management	2=1+1	IV		NIL	
V		NIL		VI	PATH-362	Bio-fertilizers and Mushroom Production	2=1+1
Agril. Extension							
I		NIL		II	EXTN-121	Dimensions of Agricultural Extension	2=1+1
Statistics							
III		NIL		IV	STAT-241	Business Statistics	3=2+1
		Total	19=09+10			Total	22=13+09

2. Department of Agricultural Economics

Semester	Course No.	Title of Course	Credits	Semester	Course No.	Title of Course	Credits
I	ECON-111	Agricultural Economics and Natural Resource Economics	3=2+1	II	ECON-123	Farm Business Management	2=1+1
	ECON-112	Structure and Dynamics of Indian Agriculture	2=2+0		ECON-124	Money and Banking	2=1+1
III	ECON-235	Agri. Co-operation, Institutions and Management	3=2+1	IV	ECON-246	Scientific Methods in Report Writing	2=1+1
V	ECON-357	Indian Agriculture Policies	2=2+0	VI	ECON-369	Planning, Formulation and Evaluation of Business Projects	3=1+2
	ECON-358	Input-Out-put Measurement Techniques	2=1+1		ECON-3610	Financial Management in Agri-Business	3=2+1
		Total	12=9+3			Total	12=6+6

3. Department of Agricultural Marketing

Semester	Course No.	Title of Course	Credits	Semester	Course No.	Title of Course	Credits
I	MKT-121	Introduction to Agricultural Marketing	2=1+1	II		NIL	
III	MKT-232	Marketing Institutions and Organizations	3=2+1	IV	MKT-243	Input Marketing Management	3=2+1
		NIL			MKT-244	Rural Marketing and Market Infrastructure	3=2+1
		NIL			MKT-245	Consumer Behaviour	2=1+1
V	MKT-356	Retail Marketing	3=2+1	VI	MKT-369	Trading of Agricultural Commodities-II	2=1+1
	MKT-357	Trading of Agricultural Commodities-I	2=1+1		MKT-3610	Market Led Extension	2=1+1
	MKT-358	Market and Trade Acts	2=2+0			NIL	
		Total	12=8+4			Total	12=7+5
Compulsory Module							
VII	MKT-4711	Marketing of Agricultural Products	10=0+10	VIII		NIL	
	MKT-4712	Marketing of Agricultural Inputs	10=0+10				
Optional Module							
	MKT-4713	Agricultural Export Procedure and EXIM Polices	3=0+3			NIL	

	MKT-4714	Demand Forecasting, Price Analysis and Future Trading.	3=0+3				
	MKT-4715	Supply Chain Management (SCM)	3=0+3				
	MKT-4716	Retail Management of Agricultural Products	2=0+2				
	MKT-4717	Marketing of Aromatic, Medicinal Plants and Spices.	2=0+2				
	MKT-4718	Management of Kiosks	2=0+2				
	MKT-4719	Marketing of Organically Produced Commodities	2=0+2				

4. Department of Agri-Business Management

Semester	Course No.	Title of Course	Credits	Semester	Course No.	Title of Course	Credits
I	ABM-	Introduction to Agri-Business	2=1+1	II	ABM123	Entrepreneurship and	2=2+0

	111	Management				Personality Development	
	ABM-112	Agro-based Industrialization	2=2+0			NIL	
III	ABM-234	Communication Skill for Business Management	2=1+1	IV	ABM-245	Agri-Business Operations, HRD and Strategic Management	2=2+0
		NIL			ABM-246	Information Communication Technology in Agri- Business	2=1+1
		NIL			ABM-247	Office Procedures for Agri-Business	1=0+1
V	ABM-358	Inventory and Risk Management	2=1+1	VI	ABM-3613	Product Promotion Methods	2=1+1
	ABM-359	Agro-tourisum	2=1+1		ABM-3614	Organizational Behaviour	2=2+0
	ABM-3510	Production Management, Planning and Control	2=1+1		ABM-3615	Managerial Accounting	2=1+1
	ABM-35111	Agro Processing Managements	2=1+1		ABM-3616	Market Survey and Price Analysis	2=0+2
	ABM-3512	Marketing and Management Policies	2=1+1			NIL	
		Total	16=09+7			Total	15=09+06

Compulsory Module							
VII	ABM-4717	Production and Marketing of Crops Produced under Protected	10=0+10	VIII		NIL	

		Cultivation					
	ABM-4718	Commercial Production of Livestock Units	10=0+10				
	ABM-4719	Processing and Value Addition of Fruits and Vegetables	10=0+10				
	ABM-4720	Commercial Production of Seed	10=0+10				
	ABM-4721	Commercial Management of Nursery	10=0+10				
	ABM-4722	Extension Techniques for Transfer of Technology	10=0+10				
	ABM-4723	Study and Management of Agrotourism Centres	10=0+10				
Optional Module							
	ABM-4724	Management of Agro-Service Centres	3=0+3			NIL	
	ABM-4725	Agricultural Finance Proposals and Management	2=0+2				
	ABM-4726	Group Sale Management	2=0+2				
	ABM-4727	Contract Farming Management	2=0+2				
	ABM-4728	Natural Resources, Economics and Market Management	2=0+2				
	ABM-4729	Project Formulation, Evaluation and Monitoring	2=0+2				
	EXTN-472	Agricultural Journalism	3=0+3				

III. Total credits and courses offered in various subjects during odd and even semesters for BBM. Agri.)

Sr. No.	Subject	Odd Semester		Even Semester		No. of total credit
		Credit	Course No.	Credit	Course No.	
1	Agronomy	3	AGRO-111	2	AGRO-122	5
2	Horticulture	4	HORT-111, 232	3	HORT-243	7
3	Botany	2	BOT-111	2	BOT-122	4
4	Soil Sci. & Agril. Chemistry.	2	SSAC-232	2	SSAC-121	4
5	Animal Sci. & Dairy Sci.	2	ASDS-231	2	ASDS-242	4
6	Irrigation Water Management	2	IWM-231		-	2
7	Agril. Engg.	2	ENGG-232	2	ENGG-121	4
8	Entomology		-	2	ENT-121	2
9	Pathology	2	PATH-231	2	PATH-362	4
10	Agril. Extension		EXTEN-472	2	EXTEN-121	2
11	Statistics		-	3	STAT-241	3
12	Agril. Economics	12	ECON-111, 112, 235, 357, 358,	12	ECON-123, 124, 246, 369, 3610.	24
13	Agril. Marketing	10	MKT-232, 356, 357, 4711 to 4719.	14	MKT-121, 243, 244, 245, 358, 369, 3610.	24
14	Agri- Business Management	16	ABM-111, 112, 234, 358, 359, 3510 to 3512, 4717 to 4729	15	ABM-123, 245, 246, 247, 3613 to 3616.	31
15	Experiential learning	20		20		40
	Total	77		83		160
16	Other Non Credits	5	MATH-111, PEDN-111, NSS-111, LANG-111			
	Grand Total	82			83	165

IV. Odd and even semesterwise distribution of theory and practical credit load for BBM. (Agri.)

Particulars	Theory	Practical	Total
Odd Semester			
I	11	5	16
III	10	10	20
V	13	8	21
VII	0	20	20
Total (A)	34	43	77
Even Semester			
II	12	8	20
IV	14	9	23
VI	10	10	20
VIII	0	20	20
Total (B)	36	47	83
Grand Total (A+B)	70	90	160

V. Semesterwise courses layout of B.B.M. (Agri.)

Semester- I

Course No.	Title of Course	Credits
AGRO-111	Agro-Techniques of Principal Crops and Agro-Metereology	3=2+1
HORT-111	Production Management of Fruit Crops	2=1+1
BOT-111	Principles of Plant Biotechnology	2=1+1
ECON-111	Agricultural Economics and Natural Resource Economics	3=2+1
ECON-112	Structure and Dynamics of Indian Agriculture	2=2+0
ABM-111	Introduction to Agri-Business Management	2=1+1
ABM-112	Agro- based Industrialization	2=2+0
	Total	16=11+5
	Non Credit Courses*	
MATH-111/ BIO-111	Mathematics / Biology	2=2+0
PEDN-111	Physical Education	1=0+1
NSS-111/ NCC-111	NSS / NCC	1=0+1
LANG-111	Structural and Spoken English	1=0+1

Semester- II

Course No.	Title of Course	Credits
AGRO-122	Sustainable Agriculture and Farming Systems	2=2+0
BOT-122	Environmental Science	2=1+1
SSAC-121	Soil Fertility, Fertilizers and Nutrient Management	2=1+1
ENGG-121	Farm Structures, Machinery and Green House Technology	2=1+1
ENT-121	Integrated Pest Management	2=1+1
EXTN-121	Dimensions of Agricultural Extension	2=1+1
ECON-123	Farm Business Management	2=1+1
ECON-124	Money and Banking	2=1+1
MKT-121	Introduction to Agricultural Marketing	2=1+1
ABM-123	Entrepreneurship and Personality Development	2=2+0
	Total	20=12+8

Semester-III

Course No.	Title of Course	Credits
HORT-232	Production Management of Vegetable and Floricultural Crops	2=1+1
SSAC-232	Soil, Water and Plant Analysis	2=0+2
ASDS- 231	Animal Production Management	2 =1+1
IWM-231	Irrigation Water Management	2=1+1
ENGG-232	Post-Harvest Technology of Cereals, Pulses and Oilseeds	2=1+1
PATH-231	Integrated Disease Management	2=1+1
ECON-235	Agricultural Co-operation, Institutions and Management	3=2+1
MKT-232	Marketing Institutions and Organizations	3=2+1
ABM-234	Communication Skill for Business Management	2=1+1
	Total	20 = 10 + 10

Semester – IV

Course No.	Title of Course	Credits
HORT-243	Post Harvest Technology of Horticultural Crops	3=2+1
ASDS-242	Value Addition in Animal Products	2=1+1
STAT-241	Business Statistics	3=2+1
ECON-246	Scientific Methods in Report Writing	2=1+1
MKT-243	Input Marketing Management	3=2+1
MKT-244	Rural Marketing and Market Infrastructure	3=2+1
MKT-245	Consumer Behaviour	2=1+1
ABM-245	Agri-Business Operations, HRD and Strategic Management	2=2+0
ABM-246	Information Technology in Agri- Business	2=1+1
ABM-247	Office Procedures for Agri-Business	1=0+1
	Total	23 = 14 + 9

Semester –V

Course No.	Title of Course	Credits
ECON-357	Indian Agriculture Policies	2=2+0
ECON-358	Input-Output Measurement Techniques	2=1+1
MKT-356	Retail Marketing	3=2+1
MKT-357	Trading of Agricultural Commodities-I	2=1+1
MKT-358	Market and Trade Acts	2=2+0
ABM-358	Inventory and Risk Management	2=1+1
ABM-359	Agro-Tourism	2=1+1
ABM-3510	Production Management, Planning and Control	2=1+ 1
ABM- 3511	Agro-Processing Management	2 =1+1
ABM-3512	Marketing Management and Policies	2=1+1
	Total	21 = 13 +8

Semester-VI

Course No.	Title of Course	Credits
PATH-362	Bio-fertilizers and Mushroom Production	2=1+1
ECON-369	Planning, Formulation and Evaluation of Business Projects	3=1+2
ECON-3610	Financial Management in Agri-Business	3=2+1
MKT-369	Trading of Agricultural Commodities-II	2=1+1
MKT-3610	Market-Led Extension	2=1+1
ABM-3613	Product Promotion Methods	2=1+1
ABM-3614	Organizational Behaviour	2=2+0
ABM-3615	Managerial Accounting	2=1+1
ABM-3616	Market Survey and Price Analysis	2=0+2
	Total	20=10+10

Semester-VII

Course No.	Activity	Credits
	Experiential Learning (A+B)	20=0+20
A	Compulsory Module	10=0+10
MKT-4711	Marketing of Agricultural Products	10=0+10
MKT-4712	OR Marketing of Agricultural Inputs	10=0+10
ABM-4717	OR Production and Marketing of Crops Produced under Protected Cultivation	10=0+10
ABM-4718	OR Commercial Production of Livestock Units	10=0+10
ABM-4719	OR Processing and Value Addition of Fruits and Vegetables	10=0+10
ABM-4720	OR Commercial Production of Seed	10=0+10
ABM-4721	OR Commercial Management of Nursery	10=0+10
ABM-4722	OR Extension Techniques for Transfer of Technology	10=0+10
ABM-4723	OR Study and Management of Agrotourism Centres	10=0+10
B	Optional Courses	10=0+10
MKT-4713	Agricultural Export Procedure and EXIM Policies	3=0+3
MKT-4714	Demand Forecasting, Price Analysis and Future Trading.	3=0+3
MKT-4715	Supply Chain Management (SCM)	3=0+3
MKT-4716	Retail Management of Agricultural Products	2=0+2
MKT-4717	Marketing of Aromatic, Medicinal Plants and Spices.	2=0+2
MKT-4718	Management of Kiosks	2=0+2
MKT-4719	Marketing of Organically Produced Commodities	2=0+2
ABM-4724	Management of Agro-Service Centres	3=0+3
ABM-4725	Agricultural Finance Proposals and Management	2=0+2
ABM-4726	Group Sale Management	2=0+2
ABM-4727	Contract Farming Management	2=0+2
ABM-4728	Natural Resources, Economics and Market Management	2=0+2
ABM-4729	Project Formulation, Evaluation and Monitoring	2=0+2
EXTN-472	Agricultural Journalism	3=0+3

Semester-VIII

No.	Activity	Credits	Weeks
	In-plant Training	20=0+20	22
1	Orientation	-	1
2	Production Unit	4=0+4	6
3	Processing Units	4=0+4	6
4	Marketing Units	7=0+7	6
5	Study Tour		
6	Report Writing and Evaluation	5=0+5	3
	Total	20=0+20	22
	Grand Total *	160=70+90	

* Credits for NC courses are not included in the total.

VI. Details of courses content (Semesterwise)

SEMESTER - I

Course No. : AGRO-111

Title : Agro-Techniques of Principal Crops and Agro-Meteorology

Credit : 3=2+1

THEORY

Crop Production: Definition, Scope, limitations and strategies. Basic elements of crop production and factors affecting crop production. Food production, food security, area, production and productivity of foodgrains in India. Classification of field crops. Seeds and sowing, intercultivation, etc., Economic importance, market value (export, import), climate, nutrient and irrigation management, interculturing practices, weed management, major pest and diseases, use of growth regulators. Cropping systems, intercropping and crop rotation. Maturity, harvesting, threshing, processing, yield packing, storage and marketing. All these production parameters for crops viz, jowar, paddy, maize, wheat, bajra, arhar, gram, green gram, black gram, pea, cowpea, groundnut, soybean, sunflower, safflower, rapeseed, mustard, linseed, sesamum, castor, sugarcane, potato, tomato, cotton, jute etc.

Concepts of Weather and Climate: Macro and microclimate and Scope of Agricultural Meteorology, its importance in agriculture, weather and climate, weather elements and factors affecting them. Composition of the atmosphere. Stratification of the atmosphere, temperature inversion. Law of radiation, solar constant, spectral distribution, nature, properties, factors affecting solar radiation, radiation balance, net radiation. Soil temperature, patterns and profiles of soil temperature, measurements and its application. Air temperature, factors affecting temperature, diurnal variation isotherms, lapse rate, stability and instability. Horizontal and vertical distribution and variation in temperature and global warming. Atmospheric pressure, variation with height, isobars, pressure gradients and coriolis force, and geostrophic wind. Trade and antitrade winds, low pressure system, monsoon depression, cyclones and anticyclones. Circulations Beaufort's scale. Atmospheric humidity, saturated and actual vapour pressure, absolute, specific and relative humidity, psychometers, diurnal variation of humidity, condensation and its forms, clouds, cloud types formation and their classification. Precipitation process, forms, types of precipitation: thunder and hailstorms. Types of monsoon, agricultural seasons. Soil moisture constants, available water, water balance, evapotranspiration, definition, actual and potential evapotranspiration, factors affecting evapotranspiration, climate requirement of important crops. Soil water relationship, physical properties of soil, volume mass relationship, classification of soil water forces acting on water movement and retention. Agro-climatic Zones of Maharashtra, drought and its classification, strategy to mitigate the

drought. Forecasting, types of weather, forecasting, basics and their importance. Remote sensing, role of remote sensing in agriculture. Crop modelling, its types and application.

PRACTICALS

Identification of seed of various crops, manures and fertilizers. Calculation of fertilizer requirement of major crops. Cost of production. GMR, NMR, B : C ratio of major crops. Sowing methods, fertilizer application methods, preparation of irrigation layout. Harvesting, threshing, processing, grading, marketing. Agromet observatory, types, selection of site and layout measurement of air and soil temperature, maximum, minimum thermometers, thermograph, dry bulb and wet bulb thermometers, calculation of vapour pressure and relative humidity. Assmanns psychrometer, hygograph, wind measurements. Measurement of rainfall by FRP rainguage, Self-recording rainguage, measurement of evaporation by open pan evaporimeter. Measurement of bright sunshine hours by Campbell Stocker's sunshine recorder. Measurement of soil temperature. Measurement of dew, measurement of pressure. Recording, tabulation and analysis of meteorological data.

Reference Books

1. Vaidya, V. G., K. R. Sahashtrabudhe and V. S Khuspe. Crop production and Field Experimentation. Continental Prakashan, Pune – 30
2. Singh, S. S. Crop Management under irrigated and rainfed condition. Kalyani Publishers, New Delhi
3. Singh, S. S. Principles and Practices of Agronomy. Kalyani Publishers, New Delhi.
4. Morachan, Y. B. Crop Production and Management. Oxford and IBH Publisher Co. Pvt. Ltd., New Delhi
5. Reddy, S. R. Principles of Agronomy. Kalyani Publishers, New Delhi.

Course No. : HORT-111

Title : Production Management of Fruit Crops

Credit : 2=1+1

THEORY

Horticultural basis for classification of tropical, sub-tropical, temperate and arid zone fruits. Importance, present status and future scope for fruit growing in Maharashtra and India. Area and production, export, import of fruit crops and plantation crops in Maharashtra and India. Nutritive value of fruits, importance of wind breaks and shelter-belts in fruit production. Nutrition and water requirement of fruit crops, climate, soil, varieties, layout, planting,

nutrient management, water management, weed control mulching, intercropping, use of growth regulators, other special horticultural practices, methods, stage of harvesting and post harvest handling of mango, banana, citrus, grape, papaya, pineapple, sapota, guava, pomegranate, ber, fig, anola, jamun, tamarind, jackfruit, kokum, karanda, phalsa, passionfruit, annona, litchi, wood apple, charoli, avocado, bael, apple, peach, pear, almond, walnut, strawberry, sweet cherry etc. cashewnut, coconut, arecanut, tea, coffee, cocoa, rubber, date palm, oil palm, betelvine etc. Industrial value of plantation crops. (Give brief cultivation information in tabular form for minor crops)

PRACTICALS

Identification of fruit and plantation crops and their varieties.

1. Special horticultural practices like bahar treatment, ringing, girdling, bending, notching, etc.
2. Practices in planning and planting systems of fruit plants.
3. Training and pruning, manures and fertilizers application, irrigation methods.
4. Study of flowering and fruiting habits.
5. Preparation and application of growth regulators.
6. Preparation and application of Bordeaux solution and paste.
7. Identification of important pests and diseases of fruit crops and their control.
8. Harvesting, post harvest treatments, grading and storage.
9. Nursery practices for raising of seedlings
10. Visit to commercial orchards.
11. Working out the economics of important fruit crops.

Reference Books

1. Hayes, W. B. Fruit Growing in India. Kitab Publishing Co., Allahabad.
2. Shammugavelu, K. G. Production Technology of Fruit Crops. SBA Publishers, Kolkatta.
3. Singh, Ranjit. Fruits. National Book Trust Ltd, New Delhi.
4. Sham Singh. Fruit Growing. Kalyani Publishers, New Delhi.
5. Bose, T. K. and S. K Mitra. Propagation of Tropical and Subtropical Horticultural Crops. Naya Udyog, 206, Bidhan Savani, Kolkatta – 700006
6. Baker, H. Fruits. Mitchell Meagrelly Publications, London.
7. Singh, A. Fruit Production and Technology. Kalyani Publications, New Delhi.

Course No. : BOT-111

Title : Principles of Plant Biotechnology

Credit : 2=1+1

THEORY

Concepts of Plant Biotechnology: History of plant tissue culture and plant genetic engineering, Scope and importance in crop improvement, Totipotency and Morphogenesis, Techniques of *in-vitro* cultures, Nutritional requirements of *in-vitro* cultures, Micropropagation, anther culture, pollen culture, ovule culture, embryo culture, test tube fertilization, endosperm culture, factors affecting *in-vitro* culture techniques, applications and achievements, Somaclonal variations, types, reasons: Somatic embryogenesis and synthetic seed production technology, somatic hybridisation and its applications in crop improvement. Genetic engineering, restriction enzymes, vectors for gene transfer– Gene cloning – Direct and indirect method of gene transfer. Transgenic plants and their applications. Blotting techniques – DNA finger printing – DNA based markers – RFLP, AFLP, RAPD, SSR and DNA Probes, Mapping QTL and future prospects. Marker Assisted Selection (MAS), and its application in crop improvement.

PRACTICALS

Requirements for plant tissue culture laboratory, techniques for plant tissue culture, media components and preparations, sterilization techniques and inoculation of various explants, aseptic manipulation of various explants, callus induction and plant regeneration, Micropropagation of important crops, anther, embryo and endosperm culture, hardening/ acclimatization of regenerated plants, somatic embryo genesis and synthetic seed production, isolation of protoplast, demonstration of culturing of protoplast, demonstration of isolation of DNA, demonstration of Gene transfer techniques, direct and indirect methods, demonstration of confirmation of Genetic transformation and gel- electrophoresis techniques.

Reference Books

1. Dixon, R.N. Plant Cell Culture: A Practical Approach. R. L. Press Oxford, Washington.
2. Gamborg, D.L. and D.C. Phillips. Plant Cell Tissue and Organ Culture. Naroso Public House, New Delhi.
3. Gupta, P.K. Elements of Biotechnology. Rastogi and Co. Meerut.
4. Bhojwani, S. S. and M. K. Razdan. Plant Tissue Culture Theory and Practice. Elsevier Science Publishers-B.V., Amsterdam
5. Razdan, M. K. An Introduction to Plant Tissue Culture. Oxford and IBN Publishing Co. Pvt. Ltd., New Delhi.

5. Natesh, S., V.L. Chopra, and S. Ramachandran. Biotechnology in Agriculture. Oxford and IBN Publishing Co. Pvt. Ltd., New Delhi

Course No. : ECON-111

Title : Agricultural Economics and Natural Resource Economics

Credit : 3=2+1

THEORY

Agricultural Economics: Meaning, definition, **Basic concepts:** Goods, Services, Utility, Value, Price, Wealth, Welfare, **Wants:** Meaning, characteristics, classification of wants, importance. Scope and importance of agriculture in National economy. **Land:** Meaning, importance, land use classification, land ownership and distribution of land, management of land . **Agricultural Labour:** Meaning, definition, types of labour, categorisation of labour wages, Minimum Wages Act, efficiency of labour. **Agricultural Capital:** Meaning, importance, capital formation in Indian agriculture and present trends. **Farm Mechanization:** Types, scope for farm mechanization, effects of mechanization. agricultural technology and its effects on Indian agriculture, green revolution, white revolution etc. Growth in agricultural output in India.

Natural Resource Economics: Natural Resources - meaning and importance of natural resources. Renewable and non-renewable natural resources - Meaning and importance. Forest Development Programme in India, surface water and ground water-their potential and utilization in Maharashtra. Importance and types of fishery, fishery development policies in India.

PRACTICALS

Exercise on land use classification, crop patterns, distribution of ownership and operational land, trends in wages, area, production and productivity of major crops in the State. Study of trends in natural resources of Maharashtra and India viz; land, forest, water and fisheries.

Reference Books

1. Agrawal, A.N. Indian Agriculture: Problems, Progress and Prospects. Vikas Publishing House Pvt. Ltd., Delhi.
2. Matoria, C.B. Agricultural Problems of India. Kitab Mahal, Allahabad
3. Owen Oliver. Natural Resource Conservation and Ecological Approach. MacMillan Co. 866, Third Avenue, New York – 10022.

Course No. : ECON- 112

Title : Structure and Dynamics of Indian Agriculture

Credit : 2=2+0

THEORY

Place of agriculture in National economy and comparison with other countries. Special characteristics of agriculture in Indian economy. Pattern of agriculture holdings, fragmentation, sub-division and consolidation of land holdings. Agricultural Productivity: Trends, causes and consequences of low productivity in India. Input utilization, fertilizers, pesticides etc. Green revolution: New strategy in development of Indian agriculture, High Yielding Varieties (HYV) programme, irrigation development and farm mechanization. Five Year Plans and place of agriculture in National planning, problems of food security. Demographic profile of Indian population. Review of development programmes: Programmes for weaker sections including Tribal, Integrated Rural Development, nature and dimensions.

Reference Books

1. Agrawal, A.N. Indian Agriculture: Problems, Progress and Prospects. Vikas Publishing House Pvt. Ltd., Delhi.
2. Mamoria, C.B. Agricultural Problems of India. Kitab Mahal, Allahabad.
3. Bansil, P.C. Agricultural Problems of India. Vikas Publishing House Pvt. Ltd., Delhi.

Course No. : ABM-111

Title : Introduction to Agri-Business Management

Credit : 2=1+1

THEORY

Agri-business: Meaning, definition, history and scope of agri-business (Input, Farm Product Sectors). Importance of agri-business in the Indian economy. Changing dimension of agricultural business. Agri-business Management-distinctive features, nature and components, importance of good management, definition of management and management functions, Five Years Plans and agri-business, characteristics of plans. Organization and operation of farm business, tools of farm business organization and operation, steps in farm business organization. Evaluation of available resources, appraisal and goals of farm business and approach to reorganization of the farm business. Farm adjustment programme under uncertainty, job of proficient farm planner, farm accountancy. Constraints in agri-business management infrastructure, technological, social and cultural. Analysis of farm records; Farm inventories. **Financial Management of Agri-business:** Importance of Financial Statement,

Balance sheet, Income account/ Profit and Loss Statement, Efficiency measures, Partial and Complete budgeting.

PRACTICALS

Preparation of alternate farm plans and farm records. Estimation of inventory, turnover and levels of inventory. Preparation of balance sheet and income statement. Farm efficiency measures and evaluation of available resources. Reorganization of farm business and farm adjustment programme under uncertainty, Farm accountancy, preparation of partial and complete budget.

Reference Books

1. Dhondyal, S.P. Farm Management: An Economic Analysis. Friends Publications, 90, Krishnapur, Meerut – 250 002.
2. Johl, S.S and T.R Kapur. Fundamentals of Farm Business Management. Kalyani Publishers, 11 Rajendar Nagar, Ludhiana – 114 008, P – 475
3. Kahlon, A.S and Karan Singh. Economics and Farm Management in India: Theory and Practice. Allied Publishers Pvt. Ltd, 15 JN Heredia Marg, Ballard Estate, Mumbai – 400 038.
4. Singh I.J. Elements of Farm Management Economics. Affiliated East West Press, Pvt Ltd, New Delhi.

Course No. : ABM-112

Title : Agro-based Industrialization

Credit : 2=2+0

THEORY

Agro-based Industries: Importance and need, classification of industries, role of agro-processing industries in the Indian economy. Types of agrobased industries-sugar mills, cotton ginning mills, dal mills, rice mills, poha mills, fruit processing industries, NOGA (Nagpur Orange Growers Association) institutional arrangement, steps in setup of agro-based industries. Constraints in establishing agro-based industries. Basis of development of agro-based industries in specific pocket e.g. sugar mills in Western Maharashtra, Ginning and processing of cotton in Vidarbha, Dal mills and Rice mills etc. Growth and Modernization of these Agro based industries in different regions – Modernization of industries, Five Year Plans: Planwise development. Employment and income generation from agro based industries at macro level and overall impact in the development of the region /State. Potential

agro-based industries- Grape wine making industries, soybean-processing industries, mango pulp processing industries. Govt. policies relating to agro-processing industries. Problems of agro-processing units. guidelines for financing of agro-processing industry in India.

Reference Books

1. Srivastava, U.K. Agro-processing Strategy for Acceleration and Exports. Oxford University Press YMCA, Library Building, Jai Singh Road, New Delhi -110001.
2. Diwase, Smita. Agri-Business Management. Everest Publishing House, Everest Lane, 536, Shaniwar Peth, Appa Balwant Chowk, Pune – 411030.

Course No. : MATH-111

Title : Mathematics

Credit : 2=2+0

THEORY

Algebra- quadratic equation, arithmetic, geometric and harmonic progressions, logarithm, Determinants and their laws. Plane Co-ordinate Geometry – point and locus of point and distance between two points, section formulae, different form of straight line. Circle, its radius and center standard form. Differential calculus – definition of function, limits, laws of limits, continuity, differentiation, theorems of differentiation, chain rule, differentiation of various types of functions. Integral Calculus – concept of indefinite integral, process of differentiation. Constant of integration, Concept of definite integral.

Reference Books

1. Warikal, P.N and J.N. Warikal. Text Book of Applied Mathematics
Vol – II. Pune Vidyarthi Griha Prakashan, Pune
2. Narayan, S. Text Book of Matrices. S. Chand and Co., Ltd.,7361, Ram Nagar, Qutab Road, New Delhi-110 055.

Course No. : LANG-111

Title : Structural and Spoken English

Credit : 1=0+1

PRACTICALS

The syntactic, semantic and graphic structures of English, form and structural meaning, word order, the basic sentences, inflections, verb patterns, group structures, adverbial group, active and passive voice, prepositions, articles, avoidance of repetition, layers of meaning, hyponymy, polysomy, antonymy, word collection associated vocabulary. The graphic substance, the paragraph, comparison, structures, spelling rules of English regulations, punctuation, public speaking, oral presentation.

Reference Books

1. Tickoo, M. L. and A. E. Subramanian. Current English for Language Skills (Lesson No. 1,2,3,4,5,7,8,9,10,11 and 13). McMillan Company India Ltd. Madras, Bombay.

Course No. : **BIO-111**

Title : **Biology**

Credit : **2 = 2 + 0**

Nature and scope of biology. Cell division. Classification of plants. Morphology of flowering plants. Genetic basis of inheritance. Main features of life. Structure and function of fundamental tissues. Chromosomal basis of Inheritance. Nutrition in man. Respiration in man. Biology in human welfare. Physiology of plants. Plant water relations. Photosynthesis. Respiration. Reproduction in angiosperms. Morphology of animals. Circulation in animals. Osmoregulation and excretion in animals. Hormonal co-ordination in human. Types of reproduction. Modes of asexual reproduction.

Reference Books

1. Bhagwat, S. D and et.al. A Text Book of Biology. Narendra Prakashan, Pune-2
2. Datta, A.C. Botany for Degree Students. Oxford University Press, New Delhi.
3. Verma, P.S. and V.K. Agarwal. Cell Biology, Genetics and Ecology. S. Chand and Co., Ltd., 7361, Ram Nagar, Qutab Road, New Delhi-110 055.
4. Bell, G.H., D.E. Smith, and C. R. Paterson. Text Book of Physiology and Biochemistry. The English language Book Society Group Limited, London.
5. Strickberger, M.W. Genetics. Prentice Hall of India Pvt. Ltd., New Delhi.
6. Bilgrami, K.S. and A.K. Pandey. Introduction to biotechnology. CBS Publications.

SEMESTER - II

Course No. : AGRO-122

Title : Sustainable Agriculture and Farming Systems

Credit : 2=2+0

THEORY

Farming System: Definition, scope, classification, components of farming system. Crops and cropping system, animal components like dairy, poultry, sheep, goat, piggery fish, duck, rabbit, trees for fuel, timber, fodder, fruits, and sericulture, apiculture, mushroom. Interactions between components, complementary and competitive factors governing choice and size of enterprises and resource allocation in farming system. Integrated farming system models for irrigated and rainfed situation. **Cropping System:** Interaction- competitive allelopathy legume effect, effect of preceding crop and associated crops. Indices for evaluation of cropping systems. Agronomic requirements in management of cropping system. Cropping scheme, calendar of operations, preparation of cropping scheme for wet garden and dry lands. **Sustainable agriculture:** Introduction, definition, goal and current concepts, sustainable yield index and sustainable value index. **Organic farming:** Definition, principles and components. Recycling of organic waste, management practices to prevent environmental deterioration, concept of sustainable agriculture. Resource management under constraint situations. Agronomic measures for management of scarce and costly inputs, delay and insufficiency of water supply, layout cost, scarcity and peak season demand, poor quality of irrigation water, soil problems, nutrient deficiency, problematic weeds, cost reduction in crop production, low cost technology and non-monetary inputs. Reclamation and development of wastelands and problematic soils, sewage farming and water farming. Rainfed farming techniques for soil and water conservation, management practices for rainfed crops, drought management, crop diversification, contingency planning for abnormal weather situation, alternate land use systems.

Reference Books

1. Chatterjee, B. N. and S. Mattie. Cropping System- Theory and Practices. Oxford and IBH Publishing Co. Pvt. Ltd., Kolkatta.
2. Reddy and Reddy. Principles of Agronomy. Kalyani Publisher, New Delhi.
3. Michael, Haines. An Introduction to Farming System. Tien Mab Lithier Printing Co. Pvt., London.

4. Palaniappan, S. P. Cropping System in Tropics-Principles and Management. Wiley Eastern Ltd., New Delhi and TNAU, Coimbatore.
5. Singh, R. P. Sustainable Development of Dryland Agriculture in India. Scientific Publishers, Jodhapur.
6. Rangaswamy, P. Dry Farming Technology in India. Agricole Publishing Academy, New Delhi.

Course No. : BOT-122

Title : Environmental Science

Credit : 2=1+1

THEORY

Scope and importance of environmental studies. Natural resources: Renewable and non-renewable resources. Forest, water, food, energy and land resources. Ecosystems: Definition, concept, structure and functions. Producers, consumers and decomposers of an ecosystem. Energy flow in the ecosystem. Types of ecosystems. Bio-diversity: Definition, classification, threats to biodiversity and its conservation. Environmental pollution: Causes, effects and control of air, water, soil, thermal, noise and marine pollution. Causes, effects and management of soil nuclear hazards and industrial wastes. Disaster management: floods, earthquakes, cyclones and land slides. Social issues and the environment, unsustainable to sustainable development. The Environment Protection Acts. Role of information technology in environment and human health.

PRACTICALS

Collection, processing and storage of effluent samples, Determination of Bio-Chemical oxygen demand (BOD) in effluent sample. Determination of chemical oxygen demand (COD) in effluent sample. Estimation of dissolved oxygen in effluent samples. Determination of sound level by using sound level meter. Estimation of respirable and non-respirable dust in the air by using portable dust sampler. Determination of total dissolved solids (TDS) in effluent sample. Estimation of species abundance of plants, Estimation of nitrate contamination in ground water. Analysis of temporary and total hardness of water sample by titration. Estimation of pesticide contamination in Agro-Ecosystem. Visit to Social Service Organisation/ Environmental Education Centre. Crop adaptation to environmental variables, soils conditions. Visit to a local polluted site, observations and remedial measures.

Reference Books

1. Dhaliwal, G.S. and D.S. Kler. Principles of Agricultural Ecology. Himalaya Publishing House, Mumbai.
2. Sharma, P. D. Ecology and Environment. Rastogi Publication, Meerut.
3. Mishra, K. C. Manual of Plant Ecology. Oxford and IBH Publishing Co., New Delhi.
4. Shukla, R.S. and P. S. Chand. Plant Ecology. S. Chand and Co., Ltd., 7361, Ram Nagar, Qutab Road, New Delhi-110 055.
5. Vasistha, P.C. A Textbook of Plant Ecology. Vishal Publications, Jalander.
6. Odum, E.P. Fundamentals of Ecology. Toppan Co. Ltd., Tokyo.

Course No. : SSAC-121

Title : Soil Fertility, Fertilizers and Nutrient Management

Credit : 2=1+1

THEORY

Soil as a medium for plant growth, soil fertility and productivity, methods of soil evaluation. Essential plant nutrients, macro and micronutrients and its role. Mechanism of nutrient uptake. **Problematic soils:** Saline, saline-sodic, sodic, acid soils and calcareous soils and their reclamation. **Organic manures:** FYM, compost, vermi compost, green manuring and its preparation, concentration, organic manure, biogas slurry, sewage and slugs, agro-industrial and urban wastes. Role of organic manures in soil fertility, organic and natural farming. **Fertilizers-** NPK fertilizers, classification, properties, reaction in soils. Mixed, complex and compound fertilizers. Fertigation, slow release fertilizers, bio-fertilizers. **Fertilizer management:** Use efficiency, handling and storage. **Integrated nutrient management:** Concepts, components, sources and utility, INM in relation to fertilizer use efficiency. Eco-friendly farming for sustainable agriculture. Soil pollution by agricultural chemicals and sewage water.

PRACTICALS

Determination of soil organic carbon, calcium carbonate, available soil NPK. DTPA extractable micronutrients and fertilizer recommendation; Plant analysis, plant tissue testing. **Analysis of organic manures:** Organic carbon, total NPK, DTPA extractable micro-nutrient and C: N ratio. **Fertilizer analysis:** Urea, ammonium sulphate, potassium nitrate, murate of potash, super phosphate, rock phosphate, mix fertilizer and compound fertilizer.

Reference Books

1. Kanwar, J. S. Soil Fertility-Theory and Practice. Published by ICAR, New Delhi.
2. Tisdale, S.L., W.L. Nelson, J.D. Beaton and J.L. Havlin. Soil Fertility and Fertilizers. Published by Prentice - Hall of India, Ltd., New Delhi.
3. Brady, N. C. and Ray R. Well. The Nature and Properties of Soils. Pearson Education (Singapore) Pvt. Ltd. Indian Branch, 482 F.I.E., New Delhi.
4. Purohit, S.S. and Dushyent Gehlot. Trends in Organic Farming in India. AGROBIOS. Agro House, Behind Nasrani Cinema, Chopasani Road, Jodhapur.
5. Acharya, C.L., P.K. Ghosh and A. Subba Rao. Indigenous Nutrient Management Practices-Wisdom alive in India – 2001. Indian Institute of Soil Science, Nabi bagh, Berasia Road, Bhopal.
6. More, S.D., K.G. Kachhave, A.S. Dhawan and V.D. Patil. Organic Farming, Issues and Strategies. Atul Book Agency, Pune.

Course No. : ENGG-121

Title : Farm Structures, Machinery and Green House Technology

Credit : 2=1+1

THEORY

Introduction, location, size and management of farmstead, septic tank, soak pit, its location, capacity, construction and maintenance, farm fencing and their types. Animal shelter and their types, poultry housing and their types, building materials, farm silos and their types. History, development and scope of green house technology, green house planning, layout and its construction. Effect of temperature, pH and CO₂ with reference to micro-climate on green house crops. Role of light, ventilation, cooling, utility of green house for different crop production, covering material, irrigation, fertigation and humidification inside green house. Pests and disease control in green house. Post harvest technology.

PRACTICALS

1. Planning and layout of farmstead.
2. Planning and layout of dairy barn.
3. Planning and layout of poultry house.
4. Study of farm fencing.
5. Study of building materials.
6. Study of silos.

7. Study of planning of green house.
8. Study of construction materials for green house.
9. Study of glazing material.
10. Study of irrigation system for green house.
11. Study of cooling system for green house.
12. Visit to various green houses.

Reference Books

1. Michael, A.M. and T.P. Ojha. Principles of Agricultural Engineering. Vol. I, Farm Power and Machinery, Farm Buildings and Post harvest technology. Jain Brothers., Jodhapur.
2. Nelson, P.V. Green House Operation and Management. Reston Pub. Co. Inc. Apprentice Hall Co. Reston, Virginia.
3. Tiwari, G.N. and R.K. Goyal. Green House Technology-Fundamentals, Design, Modelling and Application. Naroso Publishing Co., Bombay

Course No. : ENT-121

Title : Integrated Pest Management

Credit : 2=1+1

THEORY

Importance- hazards- chemical pesticides, Definition of IPM, ETL , natural control/ present-status of pesticides (chemical/ bio-pesticides) in India, components of IPM.. Integrated Pest Management strategies for paddy, pigeon pea, chickpea, cotton, sugarcane, grape, pomegranate, mango, citrus crops, okra, brinjal, tomato, potato, cabbage, cauliflower etc. Pesticide residue management, role of APEDA in relation to residues.

PRACTICALS

Pesticide manufactures, commonly available chemical and bio-pesticides in market. Visit to pesticide firms and bio control laboratory.

Reference Books

1. Dhaliwak, G. S. and R. Arora. Integrated Pest Management- Concepts and Approaches. Kalyani Publishers, New Delhi.

Course No. : EXTN-121

Title : Dimensions of Agricultural Extension

Credits : 2 =1+1

THEORY

Education - Meaning, Definition, Types – Formal, Informal and Non-formal education and their Characteristics. **Extension Education** - Meaning, definition, concepts, objectives and principles. **Agricultural Extension** - Meaning and Definition. **Rural development** - Meaning, Definition, Concepts, Objectives, Importance and Problems in rural development. **Developmental programmes of pre-independence era** - Sriniketan, Marthandam, Gurgaon Experiment and Gandhian Constructive Programme, **Development programmes of post-independence era**, Firka Development, Etawah – Pilot Project and Nilokheri Experiment. **Community Development programme** - Meaning, definition, concepts, philosophy, principles, objectives, differences between Community Development and Extension Education. **National Extension Service. Panchayat Raj system** - Meaning of democratic decentralization and Panchayat Raj, three tiers of Panchayat Raj system, powers, functions and organizational set up. **Agricultural Development programmes** with reference to objectives and salient features – Intensive Agricultural District Programme (IADP), High Yielding Varieties Programme (HYVP), Institution Village Linkage Programme (IVLP), Watershed Development Programme (WDP), National Agricultural Technology Project (NATP), ATMA, ATIC, NHM, NAIP. **Social Justice and Poverty Alleviation Programmes** - Integrated Tribal Development Programme (ITDP), Integrated Rural Development Programme (IRDP), Swarna Jayanthi Gram Swarojgar Yojana (SGSY), Prime Minister Employment Yojana (PMEY). **New trends in extension, privatisation. Women Development Programmes** - Development of Women and Children in Rural Areas (DWCRA), Integrated Child Development Scheme (ICDS) and Mahila Samridhi Yojana (MSY), Mahila Arthik Vikas Mahamandal (MAVIM). **Reorganized extension system (T & V System)** – Salient features, Fort- nightly Meeting, Monthly workshops, Linkages, Merits and Demerits, Single Window System of Extension in Maharashtra. **Broad Based Extension (BBE)** - Meaning and genesis.

PRACTICALS

1. Visit to a Village and Krishi Vidnyan Mandal to study the ongoing development programmes.
2. Visit to study the functioning of Gram Panchayat

3. Visit to Watershed Development Project.
4. Visit to a village for study of the Self Help Groups (SHGs).
5. Organizing PRA techniques in a village for identifying the agricultural problems.

Reference Books

1. Dahama, O.P. and O.P. Bhatnagar. Education and Communication for Development. Oxford and IBH Publishing Co., New Delhi.
2. Directorate of Extension: Extension Education in Community Development. Govt. of India. Delhi.
3. Ray, G.L. Extension Communication and Management. Naya Prakash, Kolkatta.
4. Sandhu, A. S. Text Book on Agricultural Communication Process and Methods. Oxford and IBH Publishing Pvt. Ltd., New Delhi.
5. Supe, S.V. An introduction to Extension Education. Oxford and IBH Publishing Pvt. Ltd., New Delhi. (Revised Edition)
6. Singh, Katar. Rural Development – Principle, Policy and Management. Sage Publication, New Delhi.
7. Swanson B.I. (Ed.) (1997). Agricultural Extension – A Reference Manual. FAO, Rome.
8. Thyagrajan, M. (1982). Project Management through Network Techniques (PERT, CPM) Indian Institute of Public Administration, New Delhi.

Course No. : ECON-123

Title : Farm Business Management

Credit : 2=1+1

THEORY

Farm Management: Meaning and definition, objectives and scope. Basic economic Principles of Farm Management, types and systems of farming, cost and returns, farm planning and budgeting, risk and uncertainty, **Farm Records:** Objectives, types and importance, farm inventory and depreciation, farm efficiency measures. **Production Economics:** Meaning, definition, nature and scope of agricultural production economics, basic concepts and terms, objectives. **Basic relationships:** Factor-Product relationships, Factor-Factor relationships and Product-Product relationships, cost concepts used in farm management studies.

PRACTICALS

Exercises on principles of farm management. Stages of production and relationship between average, marginal and total product, Working out optimum level of input and optimum product combination. Study of relationship between total, average and marginal costs. Exercises on farm planning, budgeting and farm records.

Reference Books

1. Dhondyal, S. P. Farm Management: An Economic Analysis. Friends Publications, 90, Krisnapur, Meerut – 250 002.
2. Johl, S.S and T.R Kapur. Fundamentals of Farm Business Management. Usha Raj Jumar for Kalyani Publishers, 11 Rajendar Nagar, Ludhiana – 114 008,
3. Singh, I.J. Elements of Farm Management Economics. Affiliated East West Press (Pvt.) Ltd., New Delhi.
4. Kahlon, A.S and Karam Singh. Economics of Farm Management in India: Theory and Practice. Allied Publishers (Pvt) Ltd, 15 J.N. Heredia Marg, Ballard Estate, Mumbai-400 038.

Course No. : ECON- 124

Title : Money and Banking

Credit : 2=1+1

THEORY

Money: Meaning, importance, evolution, qualities of good money material, coins and coinage, kinds of money, function of money, demand for and supply of money, monetary standards, bimetalism, monometalism and paper standard.

Banking: Types of banks, role in economic development, functions and achievements of commercial banks. Central bank – banking principles and functions of central bank, measures of credit control, monetary policy. Nationalization of banks and its impacts, role of credit institutions in development of agriculture.

PRACTICALS

Study of credit instruments i.e. cheque, promissory notes, hundies etc. Nature and types of securities. Organization and working of RBI, co-operative and commercial banks. Various schemes meant for weaker sections implemented by banks.

Reference Books

1. Dewett, K.K, G.C. Singh and J.D. Varma. Elementary Economic Theory. S. Chand and Co., Ltd.,7361, Ram Nagar, Qutab Road, New Delhi-110 055.
2. Dewett, K.K. Modern Economic Theory. Shyam Lal Charitable Trust, Ravindra Mansion Ramnagar, New Delhi –110 055.
3. Vaish, M.C. Monetary Theory. Ratan Prakashan, Educational and University Publishers, 21 Dayanand Marg, Darya Ganj, New Delhi – 110 002
4. Datta, Ruddar and K.P.M. Sundaram. Money, Banking and Trade. S. Chand and Co., Ltd.,7361, Ram Nagar, Qutab Road, New Delhi-110 055.

Course No. : MKT-121

Title : Introduction to Agricultural Marketing

Credit : 2=1+1

THEORY

Agricultural Marketing: Definition and concepts, scope and subject matter. Market and marketing: Meaning, definition, components of a market, importance of agricultural marketing, classification, types of markets, **Channel of Marketing:** Meaning, definition, channels of different products, market functionaries and their role. **Marketing Efficiency:** Meaning, definition, marketing costs, margin, price spread, factors affecting the cost of marketing, reasons for higher marketing costs of farm commodities, ways of reducing marketing cost. **Study of Market Intelligence and Market Integration:** Meaning, definition, types of market integration, market function, AGMARK, price trends, market information. co-operative agricultural marketing and public agencies involved in agricultural marketing, viz. FCI, NAFED, STC, etc. Functions of price mechanism, interrelationship between prices of inputs and output. Nature and supply of agricultural products, marketable and marketed surplus. Types and reasons for price movements and their effect on agriculture price stabilization and price support policies, **Warehousing:** State and Central Warehousing Corporations, objectives, functions, advantages, speculation, future trading and hedging.

PRACTICALS

Studies on estimation of market cost, price spread, market margins. Study on standardization, grading, storage, warehousing. Marketing of foodgrains, fruits, vegetable, milk and eggs. Study of regulated market and co-operative marketing. Price fluctuations and relationship between arrivals and prices of commodities.

Reference Books

1. Acharya, S. S. and N. L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Company Pvt. Ltd., 66 Janpath, New Delhi - 110001.
2. Gupta, A. P. Marketing of Agricultural Produce in India. Vora and Company Publishers Pvt, Ltd., 3, Round Building, Kalbadevi, Mumbai – 400 002
3. Mamoria, C. B. and R. L. Joshi. Principles and Practice of Marketing in India. Kitab Mahal, 15, Thorn hill Road, Allahabad.

Course No. : ABM-123

Title : Entrepreneurship and Personality Development

Credit : 2=2+0

THEORY

Entrepreneurship: Concept, importance, role of entrepreneurs in Agri-business development, advances and training need, etc. **Personality:** Meaning, typology of personality, classification and development of personality. **Motivation:** Meaning, function and importance of motivation in consumerism. **Motive and Drive:** Meaning of motives and drive, their influence on consumer's psychology. **Psychology:** Meaning and importance of psychology with particular reference to consumers. Basic concepts of consumers' behaviour, receptor connector effect. **Learning Process:** Meaning, elements and factors affecting learning situation, adult consumers' learning. **Intelligence:** Meaning and measurement of consumers' intelligence, factors affecting consumers' intelligence.

Reference Books

1. Ellis, R.S. Educational Psychology. D. N. Van No strand Co. Inc., New York.
2. Skinner, C.E. Educational Psychology. Prentice Hall of India Pvt. Ltd, New Delhi.
3. Dahama, O.P. and O.P. Bhatnagar. Education and Communication for Development. Oxford and IBH Publishing Co., New Delhi.
4. Supe S. V. An Introduction to Extension Education. Oxford and IBH; Publishing Co., New Delhi.

SEMESTER - III

Course No. : HORT-232

Title : Production Management of Vegetable and Floriculture Crops

Credit : 2=1+1

THEORY

Vegetable: Scope and importance of vegetable crops, area, production, distribution, exports and imports of vegetable from Maharashtra and India. Nutritive value, classification of vegetables, types of vegetable farming - kitchen garden, market garden, truck garden, vegetable production for processing, seed production, etc. Nutrition, production of vegetables, role of growth regulators in vegetable production. Cultivation of solanaceous crops, cucurbits, peas, beans, cole crops, root crops, bulb crops, tuber crops, okra, leafy vegetables, salad crops, perennial vegetable etc.

Floriculture: Importance and scope of floriculture industry in Maharashtra and India. Horticulture gardening. Principles of garden design. (Formal and Informal Garden and Land Scaping), garden features, land scaping of homes, educational institutes, hotels, resorts, city parks and industries, road side planting. Production technology of rose, chrysanthemum, aster, carnation, jasmine, marigold, gladiolus, tuberose, gaillardia, orchids, anthurium, gerbera and dahlia.

PRACTICALS

1. Identification of vegetable and floriculture and their varieties.
2. Layout of vegetable and floriculture Garden.
3. Harvesting and Post harvest handling of vegetable and floricultural crops.
4. Working out cost of cultivation of vegetable and floricultural crops.
5. Visit to commercial vegetable and floriculture gardens.
6. Identification of important pest and diseases of vegetable and floricultural crops.
7. Study of area, production, productivity, export - import of vegetables and floriculture of Maharashtra and India.

Reference Books

1. Bose, T.K., Som, M.C. and J. Kabir. Vegetable Crops. Naya Prakash, Calcutta.
2. Chaudhari, B. Vegetables. National Book Trust of India.
3. Bose, T. K. and L.P. Yadav. Commercial Flowers. Naya Prakash, Calcutta.
4. Randha, J. H. and A. Mukhopadhyay. Floriculture in India. Allied Publishing Pvt. Ltd., New Delhi.

Course No. : SSAC-232

Title : Soil, Water and Plant Analysis

Credit : 2=0+2

PRACTICALS

Layout, design and requirement of soil, water and plant analysis laboratory. Soil sampling, processing of soil samples, soil physical and chemical properties, texture, bulk density, water retention, soil reaction, conductivity, calcium carbonate, organic carbon, available NPK, Fe, Mn, Zn, Cu, B and Mo in soil, secondary nutrients Ca, Mg, S in soil, exchangeable cations Na, K, cation exchange capacity, base saturation, exchangeable sodium percentage, gypsum, requirement of alkali soils, lime requirement of acid soils. Critical values of nutrients in soils, computation of NPK fertilizer requirement as per fertilizer prescription equation for different crops. **Irrigation water analysis:** Sampling, pH, EC, cations and anions, SAR and RSC, criteria for irrigation water suitability, city and agro industrial effluents. **Plant analysis:** Sampling, processing, total N, P, K, Ca, Mg, S, Fe, Mn, Zn, Cu, B and Mo, in plants, critical values of nutrients in plants, plants nutrient diagnostic norms.

Reference Books

1. Jackson, M.L. Soil Chemical Analysis. Prentice Hall of India Pvt. New Delhi
2. Klute, A. Methods of Soil Analysis. Soil Sci. Soc. Am. Inc. Madison, Wisconsin, USA.
3. Page, A.L., Millar, R. H. and R. D. Keeney. Methods of Soil Analysis. Soil Sci. Soc. Am. Inc. Madison, Wisconsin, USA.
4. Piper, C. S. Soil and Plant Analysis. Academic press., New York.
5. Westerman, R. L. Soil Testing and Plant Analysis. No. 3, Soil Sci. Soc. Am. Inc. Madison, Wisconsin, USA.

Course No. : ASDS-231

Title : Animal Production Management

Credit : 2=1+1

THEORY

Scope of livestock in Indian economy. Livestock census and trend of livestock production. Terminology used in livestock care and management of livestock, i.e. calf, heifer, milking animal, dry animal, pregnant animal, draft animal and breeding bull. Housing of different livestock. Routine practices on livestock farm. Preparation of animal for different purposes.

Maintenance of records on livestock and dairy farms. Animal health cover, study of different diseases of livestock, viz. HS, BQ, RP, FMD, anthrax, enterotoxaemia, thiliariasis, milk fever, mastitis, ranikhet, coccidiosis mareks, CRD, fowl pox and Gumboro: their symptoms, preventive measures and treatments, structure of udder and secretion of milk, clean milk production. Reproductive systems of male and female, estrus cycle, pregnancy and parturition. Systems of breeding, artificial insemination. Summer management of buffaloes. Principles of livestock management, i.e. breeding, feeding management, feeding, housing and health cover of chicks, pullets, layers and broilers. Grading and marketing of eggs.

PRACTICALS

Study of body parts of different classes of livestock, i.e. cattle, buffalo and poultry. Handling and control of animals. Study of daily routine practices on livestock farms of different species. Vaccination schedules of livestock and poultry. Record keeping, judging of animals for dairy and draft purpose, study for breeding efficiency, study of instruments used in AI. Layout of various dairy structures. Utilization of dairy farm wastes. Routine management practices of raising broilers and layers.

Reference Books

1. Banerjee, G. C. Text Book of Animal Husbandry. Oxford and IBH Publishers, New Delhi.
2. Sashry, C.K. Thomas and R. A. Singh. Farm Animal Management and Poultry Production. NSR, Vikas Publishing House Pvt. Ltd., Delhi.
3. Hand book of Animal Husbandry, ICAR, New Delhi.
4. Panda, B. and et al. Feeding of Poultry. ICAR, Publication, New Delhi.
5. Singh, R.A. Poultry Production. Publishers, New Delhi.

Course No. : IWM-231

Title : Irrigation Water Management

Credit : 2=1+1

THEORY

Water resource development and utilization in India, Importance of irrigation, soil water plant relationship, measurement of soil moisture, irrigation water, infiltration, water requirement of crops, consumptive use and evapotranspiration, Irrigation efficiencies. **Irrigation methods:** border, check basin, furrow, sprinkler and drip irrigation. **Sprinkler irrigation:** System, types, planning, layout, components, care and maintenance. **Drip irrigation:** Types, components, planning layout, care and maintenance.

PRACTICALS

1. Determination of soil moisture by gravimetric method.
2. Measurement of irrigation water by weirs, notches and flumes.
3. Measurement of infiltration and analysis of infiltration rate.
4. Estimation of water requirement by different methods.
5. Study of different components of drip irrigation system.
6. Study of different components of sprinkler irrigation system.
7. Estimation of irrigation efficiencies.
8. Cost economics of drip/sprinkler system.
9. Care and maintenance of micro-irrigation system.

Reference Books

1. Michael, A.M. Irrigation: Theory and Practice. Vikas Publishing House Pvt. Ltd., Delhi.
2. Murthy, V. V. N. Land and Water Management. Kalyani Publishers, Ludhiana.
3. Michael, A.M. and T.P. Ojha. Principles of Agricultural Engineering. Vol. I, Farm Power and Machinery, Farm Buildings and Post harvest technology. Jain Brothers., Jodhapur.
4. Shivnappan, R.K. Drip Irrigation. Keerti Publishers House, Trivandrum
5. Radhey Lal. Irrigation Hydraulics. Saroj Prakashan, Allahabad

Course No. : ENGG-232

Title : Post-Harvest Technology for Cereals, Pulses and Oilseeds

Credit : 2=1+1

THEORY

Importance of Post harvest technology. Problems occurring in harvesting, threshing, transport, drying, milling and marketing. Moisture content and its measurement. Drying and its importance: Methods of drying grains. Thin layer and deep bed drying (excluding mathematical expression). Equilibrium moisture content (excluding mathematical expression). Grain dryers. Food grain storage structures. Bulk storage structures. Unit operations in seed processing. Equipments for cleaning, sorting, grading and separation. Technology of parboiling of paddy. Principles of parboiling, Advantages of parboiling oil expression and extraction. (Storages structure). Material handling equipments (excluding design), Principles of refrigeration, etc.

PRACTICALS

1. Study of different moisture measuring methods.
2. Study of various types of grain dryers.
3. Study of different types of sieves and screens.
4. Study of cleaning equipments.
5. Study of graders and separators.
6. Study of belt, screw conveyers and bucket elevators (excluding design).
7. Study of modern rice milling machineries.
8. Study of pulse milling (Flow charts of wet milling and dry milling of pulses).
9. Study of vapour compression system of refrigeration.
10. Study of refrigerated storage / cold storage.
11. Study of mechanical expression devices (Hydraulic press and screw press).
12. Economics of drying methods.

Reference Books

1. Sahay, K.M. and K. K. Singh. Unit Operations of Agricultural Processing. Vikas Publishing House Pvt. Ltd., New Delhi.
2. Chakravarty, A. Post Harvest Technology of Cereals, Pulses and Oilseeds. Oxford and IBH, Publishing Com. Pvt. Ltd., New Delhi.
3. Michael A.M. and T.P. Ojha. Principles of Agricultural Engineering. Vol. I, Farm Power and Machinery, Farm Buildings and Post harvest technology. Jain Brothers., Jodhapur
4. Henderson, G.A. and R.C. Perry. Agricultural Processing Engineering. AVI Publishing Co. West-Port, Connecticut, USA.
5. Hall, C.W. Drying. Farm Crops. Mohan Makhijani at Rekha Printers, New Delhi.

Course No. : PATH – 231

Title : Integrated Disease Management

Credit : 2=1+1

THEORY

Disease, concept of disease, economic importance of diseases, losses, epiphytotic diseases. Definition of IDM, IDM concept, advantage and importance, components of IDM, development of IDM strategy for important crops viz, Cotton, Groundnut, Sunflower, Sorghum, Bajra, Rice, Wheat, Sugarcane, Grape, Banana, Pomegranate, Mango, Citrus, Fig,

Guava, Tomato, Potato, Chilli, Okra, Brinjal, Cabbage and Cauliflower. Present status of fungicides/bio-agents in India. Fungicides and bio-agents in use. Post-harvest diseases of important crops and their management.

PRACTICALS

Collection and identification of disease samples and their preservation. IDM components and implementation of IDM strategies. Phytosanitary measures and certification. Impact of IDM implication. Fungicides, fungicide formulations, commonly available fungicides in market. Bio-agents, methods of application of bio- agents. Visits to field/ orchard, visit to bio agent mass multiplication laboratory.

Reference Books

1. Singh, R. S. Introduction to Principles of Plant Pathology. Oxford and IBH Co., New Delhi
2. Agrios, G. N. Plant Pathology. Published by a division of Reed Elsevier India Pvt., Ltd., New Delhi

Course No. : ECON-235

Title : **Agricultural Co-operation, Institutions and Management**

Credit : 3=2+1

THEORY

Co-operation: Principles of co-operation and its application in Agriculture. Importance of co-operation in agriculture and rural development. Co-operation compared with capitalism, socialism, communism, and co-operative movement in India. **Co-operative marketing and processing Institutions:** Institutional, non – institutional and multi-agency approach, Forms of co-operatives, Role of co-operation in rural development. Co-operative Education and Training. State Co-operative Union and NCDC, Co-operative administration and HRM, Co-operative Management: Nature and Functions, Professional Management of Co-operatives, Role of leadership in Co-operative management.

PRACTICALS

To study working of Primary Agricultural Co-operative Credit Society, District Central Co-operative Bank, State Co-operative Bank, M.S. Co-operative Bank for Agricultural and Rural Development. Forms of Co-operatives. Procedure for obtaining loans. Formulation of loan proposals. Economic feasibility of a farm credit proposal. Study of Co-operative Marketing,

Study of processing of cereals, pulses and oilseeds managed by co-operatives, Study of NCDC.

Reference Books

1. Bedi, R.D. History and Practice of Co-operation Theory. R. Lal book Depot near Govt. Inter College, Meerut (UP). 250 002.
2. Mamoria, C.B. and R. D. Saxena. Co-operation in India, Kitab Mahal, 15-Thorn Hill Road, Allahabad.
3. Joshi, S.S. and Charles V. Moore. Essentials of Farm Financial Management. Today and Tomorrow's Printed and Publishers – 22 B-5, Original Road, Karol Baugh, New Delhi – 110 005.
4. Hajela, T. N. Co-operation Management in India.

Course No. : MKT-232

Title : Marketing Institutions and Organizations

Credit : 3=2+1

THEORY

Objectives, structure and functioning of Agricultural Marketing. Institutions and Organizations. Agricultural Produce Market Committee, Cotton Corporation of India and State Cotton Federation, Food Corporation of India (FCI), State Trading Corporation (STC), National Co-operative Marketing Federation, Agricultural Processed Products and Export Development Authority (APEDA), Maharashtra State Agricultural Marketing Board (MSAMB), The National Agricultural Co-operative Marketing Federation of India (NAFED), Jute Corporation of India, Tobacco Board, Coconut Board, Grape Growers Association (Mahagrape), Mango Growers Association (Mahamango), The Directorate of Marketing and Inspection (DMI), National Dairy Development Board (NDDB).

PRACTICALS

Visit to different marketing institutions/organizations (located in the local district). To study the organization, function and achievements in marketing of farm products.

Reference Books

1. Acharya, S.S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH publishing company Pvt. Ltd. 66, Janpath, New Delhi – 1.
2. Memoria, C.B. and R.L. Joshi. Principles and Practice of Marketing in India. Kitab Mahal, 15, Thorn hill Road, Allahabad.

Course No. : ABM – 234

Title : Communication Skill for Business Management

Credit : 2=1+1

THEORY

Communication: Meaning and SMCRE communication model. **Communication and diffusion:** Meaning and elements of diffusion, relation between communication and diffusion. **Characteristics of innovations:** Relative advantages, computability, complexity, trial ability, absorbability. **Innovation:** Decision process; meaning, stages in innovation decision process. Knowledge, persuasion, decision, implementation and confirmation. Innovativeness and adopter categories: Meaning of adopter categories, rate of adoption. **Extension teaching methods and aids:** Selection of methods in teaching, various teaching aids, their applications, etc. Social change and consequences of innovations: Meaning of social change, consequences, equality in the consequences of innovation. **Opining leaders and change agents:** Meaning and their role in agricultural development.

PRACTICALS

Preparation and use of extension teaching methods, result demonstration, method demonstration, group discussion, farm tours, news stories, leaflets, circular, letters, radio talk, and T.V. script writing. Visit to nearby AIR and T.V. kendras. Practices in handling and use of audio aids. Practices in handling and use of audio visual aids: Movie projector, film strip and slide projector, over head projector, tape recorder, cameras, etc.

Reference Books

1. Dahama, O.P. Extension and Rural Welfare, Ramprasad and Sons, Agra.
2. Dahama, O.P. and O.P. Bhatnagar. Education and Communication for Development. Oxford and IBH publishing Co., New Delhi.
3. Director of Extension. Extension Education in Community Development. Government of India, Delhi (1961).
4. Haze, Kenneth, P. and Paeker, Harry, G. Preparation and Use of Audio Visual Aids. Prentice Hall of India Pvt. Ltd. Publication
5. Supe, S.V. An introduction to Extension Education. Oxford and IBH Publishing Co., New Delhi.
6. Supe, S.V. Project-Book Extension Teaching Methods. Department of Agricultural Extension, PDKV, Akola.

SEMESTER - IV

Course No. : HORT-243

Title : Post-Harvest Technology of Horticultural Crops

Credit : 3=2+1

THEORY

Maturity, harvesting and handling in relation to extended shelf- life and storage quality of fruits and vegetables. Maturity and harvesting indices. Factors responsible for maturity, ripening and deterioration of horticultural produce. Methods used for harvesting and post-harvest treatment for delaying ripening. Respiration and transpiration rate during packaging and storage. Methods of pre-cooling, grading, packaging, storage and transport of fruits and vegetables. Importance and scope of fruits and vegetables preservation. Selection of site for fruit and vegetable preservation unit. Principles and methods of preservation. Preparation of jams, jellies, marmalades, squashes, juices, syrups, preserves, crystallized fruits, chutney, pickle and ketchups. Spoilage of processed products. Post harvest management of cut flowers. Control of post harvest diseases of important fruits and vegetables.

PRACTICALS

Maturity indices, harvesting of various fruits and vegetables. Pre-cooling, grading, packaging and storage of fruits and vegetables. Pre-harvest and post-harvest application of chemical substances. Harvesting, packaging, storage and marketing of cut flowers. Identification of different equipments used in processing of fruits and vegetables. Canning of fruits and vegetables. Preparation of jams, jellies, marmalade, squashes, syrups, preserves, ketchup, pickles, chutney etc. Drying of fruits and vegetables. Working out the economics of important processed products. Study of spoilage of different processed products. Visits to fruits and vegetables preservation units.

Reference Books

1. Pantastico, E. R, B. Post Harvest Technology, Handling, Utilization of Tropical and Sub-tropical Fruits and Vegetables. The AVI publishing Co. West-Port, Connecticut, USA.
2. Salunke, D.K. and Desai, B.B. Post Harvest Biotechnology of Vegetables. II CRC press, Boca Raton, Florida.
3. Kader, A.A. Post Harvest Technology of Horticultural Crops. Publication Co. 3311, University of California, Division of Agricultural and Natural Resources, California.
4. Varma, L.R. and V.K. Joshi. Post Harvest Technology of Fruits and Vegetables, Vol. II. Indus Publishing Company, New Delhi – 110 027.

Course No. : ASDS -242

Title : Value Addition in Animal Products

Credit : 2=1+1

THEORY

Present status of different industries like dairy, poultry, meat, wool and hide industries in WTO regime. Composition of milk from different species. Marketing of indigenous value added milk products viz., Butter, Ice-cream, Ghee, Pedha, Rasgoola etc. Packaging of milk, meat, egg and their products and export. Production and marketing of eggs, broilers and layers. Utilization of animal dung, poultry manure for F.Y.M. and gobar gas production and its value. Marketing of animal products and price regulation in animal products. Factors influencing price. Trends in marketing and utilization of animal products. Importance of hides and bones, export and import of animal products. Buffalo meat production, quality standards, storage and packages. Market standards and regulation of animal products.

PRACTICALS

1. Organoleptic quality and evaluation of milk and milk products- meat, egg, wool and chicken.
2. Physical properties of milk, meat, egg, wool and chicken.
3. Chemical composition of different animal products.
4. Study of different marketing systems for animal products.
5. Processing and preservation of animal products for marketing.
6. Different packaging materials useful for animal products.
7. Visit to existing marketing structures of animal products, co-operatives and private organizations.
8. Different methods of slaughtering the animals and their effects on quality of products.

Reference Books

1. Singh, R.A. Poultry Production. Kalyani Publishers, New Delhi.
2. Maske, O Norton. Commercial Chicken Production. Manuel AVI Publishers, INC West Port.
3. Devendra, C. and G. B. McElroy. Goat and Sheep Production in Tropics – Long man Group Ltd., London.
4. Wong, et al. Fundamental of Dairy Chemistry. Publishers Van Nostrand Rein hold Comp. New York.
5. Ling, E.R. Text Book and Dairy Chemistry. Chapman Hall Ltd., London.

Course No. :STAT-241

Title :Business Statistics

Credit : 3=2+1

THEORY

Definition of statistics, meaning, scope, statistics and industry, its applications, uses and misuses of statistics in business. Frequency distribution, raw data, the array frequency distribution, determining classes and class interval, cumulative frequency distribution. Graphic presentation of data. Measures of central tendency, AM, Median, Mode, GM, HM for grouped and ungrouped data. Characteristics of mean, mode and median, weighted mean, their uses and applications. Dispersion, Range, Mean Deviation, Variance, Standard Deviation, Properties of SD, relative measures of dispersion for grouped and ungrouped data, Skewness, Kurtosis and moments. Probability and probability distribution. Definition of probability, mathematical probability. Empirical probability and axiomatic approach. Events, sample space, probability of independent and dependent events. Generalization and extensions of the law of probability formula. Discrete probability distribution. Binomial and Poisson distribution and its parameters. Normal distribution, its properties and procedure of fitting the normal curve. Tests of hypothesis-two-sided test, one sided test, confidence limit. Critical region, power of a statistical test. Study of student's 't' distribution. One sample, two sample 't' test. 'F'-test, χ^2 test, uses and applications. Study of simple correlation and regression. Scatter diagram. The least-square criteria for fitting simple regression. Tests of hypothesis for slope and correlation coefficient. The standard errors of estimates. Multiple and partial correlation, multiple regression up to three variables. The normal equation with least squares estimates. The matrix theory approach in solving the normal equations and testing the significance of partial regression coefficients. Coefficient of multiple determination and its significance. Time series and index number analysis.

PRACTICALS

1. Classification of data (problems on exclusive and inclusive classification).
2. Computation of AM, GM, HM, Median, Mode for discrete ungrouped data and grouped data.
3. Computation of AM, GM, HM, Median and Mode for continuous series.
4. The estimation of measures of dispersion, range, mean deviation from averages, variance, standard deviation, standard error and relative measures such as CV, coefficient of MD.

5. The computation of range, MD, variance, standard deviation, standard error and CV coefficient of MD for grouped data.
6. Student's 't' test for one sample, paired 't' test and unpaired 't' test and 'F'-test.
7. Computation of χ^2 for one sample 2 x 2 and n x k contingency table.
8. Calculation of correlation coefficient and regression coefficient. $Y = a + bx$, $X = a^1 + b^1y$ and testing significance of r and b.
9. Computation of three variable multiple linear regression equation by using matrix inverse and testing significance of partial regression coefficient and R^2 .
10. Fitting of Binomial and Normal distribution.
11. Fitting of linear, semi-log parabolic trend equations to time series data.
12. Fitting of modified exponential, Gompertz, and Logistic growth curve.
13. Seasonal variations-By methods of simple averages and ratio to moving average method.
14. Seasonal variations by ratio to trend method and method of link relatives.
15. Measurement of cyclic and irregular variation.
16. Construction of Index Numbers.
17. Procedure of base shifting, deflation of dices.

Reference Books

1. Croxton, F. E., D.J. Cowden and Ben, W. Bolch. Practical Business Statistics. Prentice Hall of India Pvt. Ltd. Publication.
2. Gupta, S.C. Fundamentals of Statistics. Himalaya Publishing House.
3. Gupta, S.C and V.K. Kapoor. Fundamentals of Mathematical Statistics. Sultan Chand and Sons, New Delhi- 110 002

Course No. : ECON-246

Title : Scientific Methods in Report Writing

Credit : 2=1+1

THEORY

Scientific methods: Meaning, modern concept of scientific method. Inductive and deductive process. **Research problem:** Definition, nature, selection of problem. Components and formulation of hypothesis, types of hypotheses, characteristics and functions of hypotheses, testing of hypothesis. **Sampling:** Meaning, need for sampling, types of sampling with their merits and demerits. **Data:** Sources, types, methods of data collection, observations, interviews, questionnaire, schedule analysis, inferences and reporting of research. **Case**

studies: Meaning, selection, analysis and interpretation. Economical and statistical analysis of large sample, use of various tools and tests.

PRACTICALS

1. A study of scientific steps in social science.
2. Study of classification of data.
3. A study of research process in flow chart.
4. A study of parts of table and types of tabulation.
5. Testing of hypothesis (Adaptation and extension to economic studies). Test of significance based on 't', 'Z', 'X²' and 'F' distribution.
6. Study of elements and types of economic analysis (Types only).
7. Principal forms of presenting analysis, i.e. tabular form, graphic form, line graphs, bar graphs, pie or circular graph, map etc.
8. Study of different steps in reporting of research.

Reference Books

1. Goode, W.J. and Hyatt. P. K. Methods in Social Science. McGraw Hill Book, New York.
2. Kothari, C. R. Research Methodology: Methods and Techniques. Willey, Eastern Mini, New Delhi.
3. Dhondyal, S. P. Reserch Methodology in Social Science and Essential of Thesis writing.
4. Wilkinson, T.S. and Bhandarkar. Methodology and Techniques of Social Research.
5. Reddy, C. R. Research Methodology in Social Science.

Course No. : MKT-243

Title : Input Marketing Management

Credit : 3=2+1

THEORY

Scope and importance of agricultural input marketing management. Study of demand and supply scenario of major agro-inputs: seeds, fertilizers, agro-chemicals, farm machineries and electricity. Production organizations in seeds, fertilizes, agro-chemicals. New product development, product introduction. Branding and packaging for major agro-inputs. Formulation of marketing strategy. Marketing, planning and implementation for agro-inputs. Market promotion – Advertising, personal selling, sales promotion and publicity. Sales force management. Management of distribution system for major agro-inputs. Pricing of agro inputs. Information system for input marketing. Short term credit loan for procurement of inputs.

PRACTICALS

1. Visit to seed organizations (MSSC, Mahabeej etc.) – Study of production, pricing, transportation and promotion of seeds.
2. Study of Chemical fertilizer production Units.
3. Public sector, Co-operative Sector, Private Sector Companies and their products range.
4. Study of Demand and Supply of chemical fertilizers and gap therein.
5. Types of agro-chemicals used as agricultural inputs.
6. Visit to Agricultural Exhibition. Role of Agricultural exhibitions in marketing of Agro-inputs.
7. Market survey to know potentiality of different crop seeds, fertilizers, various plant protection chemicals and farm machineries of local market.

Reference Books

1. Acharya, S.S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Company Pvt. Ltd., 66, Janpath, New Delhi – 1.
2. Memoria, C.B. and R.L. Joshi. Principles and Practice of Marketing in India. Kitab Mahal, 15, Thorn hill Road, Allahabad.

Course No. : MKT-244

Title : Rural Marketing and Market Infrastructure

Credit : 3=2+1

THEORY

Profile of rural marketing, definition, classification, strategies, characteristics, changing pattern of rural market, problems in rural marketing. Rural marketing in India – Difference between urban and rural market, study of rural resources, rural poverty. Rural marketing and research – Sources for conducting marketing research, dos and don'ts for rural marketing and rural industries. Rural segmentation - Targeting and positioning. Rural product and prices – Introduction, packing, pricing methods, rural branding. Rural distribution / channels of distribution, functions of rural sales persons.

Rural communication – Introduction, types, factors affecting rural communication, problems. Market infrastructure – Meaning, facilities included and its importance.

PRACTICALS

Visits to various rural markets including daily, weekly bazaars etc and their complete profile studies. Studies of market infrastructure such as market yard, grading and methods of sale.

Reference Books

1. Acharya, S.S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH publishing company Pvt. Ltd. 66, Janpath, New Delhi – 1.
2. Memoria, C.B. and R.L. Joshi. Principles and Practice of Marketing in India”. Kitab Mahal, 15, Thorn hill Road, Allahabad.
3. Ramtishen, Y. Rural and Agricultural Marketing. VES College of Arts, Science and Commerce, Mumbai. Jacob Publishing House.

Course No. : MKT-245

Title : Consumer Behaviour

Credit : 2=1+1

THEORY

Consumer buying: The decision making process. Consumer information processing, consumer learning process. Consumer’s belief, attitudes and behaviour, consumer preferences, post-purchase processes, situational influence. Social classes and buying behaviour. The economics of consumption. The law of demand, factors influencing demand, opportunity cost, decreasing marginal utility and price elasticity. The economic cycle and consumer behaviour. Consumers spending and savings. Consumer behaviour and the marketing manager. Product positioning, marketing mix development.

PRACTICALS

Law of demand and supply. Engle’s law of family expenditure. Elasticity of demand and supply. Law of diminishing marginal utility. To workout the income and expenditure pattern of consumers, Household surveys for consumers preferences, programme, Market survey of commodity choices and relevant factors.

Reference Books

1. Shiffman, L.G. and L.L. Kanuk. Consumer Behaviour. Prentice-Hall of India Pvt. Ltd., M-97, Connaught Circle, New Delhi – 110 001

Course No. : ABM – 245

Title : Agri-Business Operations, HRD and Strategic Management

Credit : 2=2+0

THEORY

Human Resources Management: Concept, objectives, nature and scope of the human resource. **Planning:** Problems in HR planning. Job Analysis. Job description and job specification. **Human Resource Acquisition:** Meaning, sources, methods, selection and

selection process, placement, induction, socialization. **Development of Human Resources:** Training – importance, need, methods and procedures. Management Development Programmes-Purposes and methods. Strategic Management- Emergence of strategic management, need of strategic management. Corporate strategy – Concept, components and functions. Nature, components and significance of Environmental Scanning. Analysing external environment opportunities and threats – Economic, technological, competitive, political, social and cultural. Corporate Capability Analysis. Concept and significance of synergy and analysing synergy. **Core competence:** Concept, cosmic features. **Value Chain Analysis** – Concept, types, analysis and linkages. Value system, significance in strategy making. **Setting corporate objectives:** Concept, purpose, mission need and process. **Forces interacting with corporate objectives** – External and internal. Identifying strategic alternatives. Choice of corporate strategies (CIT, CASCADE and PORTFOLIO Models), formulate implementation and legitimacy.

Reference Books

1. Siva Rama, K., K. Ramesh and M. Gangadhar. Human Resource Management in Agriculture. Discovery publication, New Delhi.
2. Wayne, Monday R and Robert M, Noël. Personnel: The Management of Human Resource. Allyn and Bacon, Boston.
3. Gary Dazzler. Human Resource Management.
4. Aswathappa, K. Human Resources and Personal Management.

Course No. : ABM-246

Title : Information Technology in Agri-Business

Credit : 2=1+1

THEORY

History of computers, hardware and software of computers, MS Office (MS word, MS power point, MS Excel)- Scope, uses and its application. **Information Technology:** Meaning, role and importance in agri-business and agricultural marketing, Applications of information technology. Networking: Definition, uses, types of network (LAN, MAN, WAN) INTRANET, EXTRANET. **Internet:** Definition, history, scope, applications e-mail, architecture of e-mail, adding Internet connection, sharing Internet connections. **Multimedia:** Definition, uses, application in agri-business and agricultural marketing, types of media

(study of various HTML Tag). **Database:** Meaning, uses of database, how to store organizational data in a systematic form, functions, formulae used in database, printing of database. **E-Commerce:** Meaning, definition, applications in agri-business and agricultural marketing, Advantages over traditional marketing.

PRACTICALS

1. At least 10 Practicals based on Web design using HTML editor.
2. At least 5 database Practicals using ACCESS/ Fox-Pro (Programmes)
3. Visits to C-DAC, Government and private organisations engaged in e-commerce.

Reference Books

Latest books available on computers and software and their applications.

Course No. : ABM-247

Title : Office procedures for Agri-business

Credit : 1=0+1

PRACTICALS

Practicals based on office documents, drafting (Letter, semi-official, purchase, enquiry, quotations, purchase orders, queries and replies), payments, billing and preliminary requirements, files, filing system and indexing, report and publication procedure, visits to ISO (International Standard Certificate) certificate organisations, Government and private. Study of these offices and their functioning.

Reference Books

1. Civil Service Rules, Government of Maharashtra.
2. Maharashtra Agricultural Universities Account Code.
3. Accounts books prescribed for post-recruitment examination of State Government.
4. Bhalla, V.K. Invest Management (Security and portfolio Management). S. Chand and Co., Ltd., 7361, Ram Nagar, Qutab Road, New Delhi-110 055.
5. Pillai, R.S.N. and Bagavati. Office Management. S. Chand and Co., Ltd., 7361, Ram Nagar, Qutab Road, New Delhi-110 055.

SEMESTER - V

Course No. : ECON- 357

Title : Indian Agricultural Policies

Credit : 2=2+0

THEORY

Agricultural policies: Meaning, types and importance, evolution of agricultural policy
Famine Commission Report, Royal Commission on Agriculture: Recommendations, Drought
Prone Area Programme (DPAP), Land Reform Policy, Nature and objectives of land reforms,
Tenancy reforms, Crash Scheme for Rural Development, Major Agricultural input policies
including seed, fertilizer, pesticides, credit and irrigation. National Rural Employment
Programme, Abolition of Bonded Labour, Jawahar Rojgar Yojana, Employment Assurance
Programme and other recent Agricultural Development Programmes. New Agricultural
Export Policies for different commodities.

National Forest Policy: National Forest Policy of 1952, Forest Policy of 1988, Forest
Development Programme, Social Forestry, Animal Husbandry, Dairy Improvement in cattle
breeding, Government policy regarding Animal Husbandry and Poultry Development.

Reference Books

1. Jain, S.C. Agricultural Policy in India. Allied Publishers Pvt. Ltd. Mumbai, Kolkatta, New Delhi.
2. James, P.G. Agricultural Policy in Wealthy Countries. Ague and Robertson Publishers, Sydney.
3. Karla, O.P. Agricultural Policy in India. Bombay Popular Prakashan, Mumbai.
4. Datta, K.K. and K.P.M. Sundaram. Indian Economy. Latest Edition, S. Chand and Co., Ltd.,7361, Ram Nagar, Qutab Road, New Delhi-110 055. and Co. New Delhi
5. Banerjee, G. C. Text Book of Animal Husbandry. Oxford and IBH Publishers, New Delhi.
6. Mahanta, K.C. Animal Husbandry in India.

Course No. : ECON- 358

Title : Input-Output Measurement Techniques

Credit : 2=1+1

THEORY

Nature and scope of input-output relationship, production concept, factor-product relationship, forms of production functions and their characteristics, production surfaces, isoquants, isoclines and their economic applications. Quantitative estimation of parameters of input-output relationship, and their interpretation, principle of choice and resource allocation, price and product relationship, resource substitution, cost minimization, resource combination and enterprise combination, returns to scale and farm size.

PRACTICALS

Estimation procedure, interpretation and economic application of linear, Quadratic and Cobb-Douglas production functions by OLS method. Returns to scale and farm size- examples. Derivation of cost and supply functions from production function.

Reference Books

1. Raju, V.T. and V.S. Rao. Economics of Farm Production and Management. Oxford and IBH Publishing Co. Pvt., Ltd., New Delhi.
2. Dhondyal, S.P. Farm Management: An Economic Analysis. Friends Publications, 90 Krisharpan, Meerut- 250 002
3. Johl, S.S. and T.R. Kapur. Fundamental of Farm Business Management. Kalyani Publishers, 11, Rajendranagar, Ludhiana- 114 008
4. Singh, I.J. Elements of Farm Management Economics. Affiliated East-West Press Pvt. Ltd., New Delhi
5. Heady, E.O. Economics of Agriculture Production and Resource Use. Prentice Hall of India Pvt. Ltd., New Delhi- 110 001
6. Heady, E.O. and J.I. Dillon. Agricultural Production Functions. Kalyani Publishers, 11, Rajendranagar, Ludhiana- 114 008.

Course No. : MKT- 356

Title : Retail Marketing

Credit : 3=2+1

THEORY

Retailing: Concept, types of retailers, supermarkets, factory outlets, hypermarkets. Non-store retailing. Retailer-marketing decisions. Direct selling, one to one selling, one to many selling, direct marketing and multilevel marketing. Major types of retail organisation, co-operative chain stores, voluntary chain, retailers and consumers cooperatives. Retail Chain Management by Corporate Houses. Procurement decision. Price, promotion and place decision. Role of Consumer, Packaging and Market Segmentation in Retail Marketing. **Store Management :** Retail location, merchandising, using price to stimulate market sale. **Branding Strategy:** Manufacturer's brand, private label, brand for a sale. Trends in retailing. Retailing strategy. Impact of retailing on economy and society.

PRACTICALS

Studies and surveys of different types of retailing stores (public, private and co-operative) in the jurisdiction. Case studies of major types of retailing stores. Studies of retailers carrying out different marketing functions. Study of market segmentation for retail market. Study of corporate retail-chain stores.

Reference Books

1. Philip Kotler. Marketing Management. Pearson Education Publishers, New Delhi.
2. Swapnapradhan. Retail Management. Gibson and Redamani.
3. Panvar, J.S. Beyond Consumer Marketing. Response Books, Sage Publications, New Delhi.
4. Pandey, Mukesh and Deepak Tiwari. Rural and Agricultural Marketing. International Book Distribution Co., New Delhi.

Course No. : MKT- 357

Title : Trading of Agricultural Commodity-I

Credit : 2=1+1

THEORY

Importance of agricultural commodities in agricultural marketing. Marketing of cereals- rice, wheat and jowar. Marketing of pulses-mung, tur, gram, urid etc. Average cost of processing wheat into wheat flour, paddy to rice, comparison of different rice milling methods. Study on

price spread of important crops and producer's share in consumer's rupee. Marketing of mango, citrus and grapes. Marketing of vegetables. Improving efficiency in commodity marketing. Role of co-operative and regulated market in commodity marketing.

PRACTICALS

Practical exercises on marketing costs, market margins and producer's share in consumer's rupee for important cereals, pulses, fruits and vegetables.

Reference Books

1. Acharya, S.S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing company Pvt. Ltd., 66, Janpath, New Delhi 110001.
2. Mamoria, C.B. and R.L. Joshi. Principles and Practice of Marketing in India. Kitab Mahal, 15, Thorn hill Road, Allahbad.

Course No. : MKT - 358

Title : Market and Trade Acts

Credit : 2=2+0

THEORY

Evolution of market legislation. Procedures, need and scope for market legislation. Regulation of market. Growth and development of regulated markets. Review of Agricultural Produce Market Acts in Maharashtra and India. Regulated Market Act, 1937, Organization of regulated markets, constitution of market committee, finance of the market committee, functions of market committee. Agriculture Produce (Grading and Marketing) Act- 1937. AGMARK Cold Storage Order- 1964, Cold Storage- 1980. Fruit Product Order-1955. Meat Food Production Order-1977, Prevention of Food /Adulteration Act-1912. All India Rural Credit Survey Committee Reports - 1954, Maharashtra Agricultural Produce Marketing (Regulation) Act -1963 and New Marketing Model Acts, Consumer Protection Act-1986. Central Ware Housing Corporation Act- 1957. National Co-operative Ware Housing Board Act -1956. State Warehousing Corporation Act - 1958. Weighing and Measurement Act. NAFED, FCI, Export- Import Policy- 1992-97.

Reference Books

1. Acharya, S. S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Co. Ltd. 66 Janpath, New Delhi. 110 001.
2. Mamoria, C.B. and R.L. Joshi. Principles and Practices of Marketing in India. Kitab Mahal, 15, Thorn Hill Road, Allahabad.

3. Panvar, J.S. Beyond Consumer Marketing. Response Books Sage Publications, New Delhi

Course No. : ABM – 358

Title : Inventory and Risk Management

Credit : 2=1+1

THEORY

Introduction to Inventory – Definition, types and its need. Cycle of inventory management. Order Quantity – Economic Order Quantity (EOQ) Model. Safety stock. Pricing of raw material and valuation of stock. Monitoring and control of Inventories – ABC Analysis, Just-in-time inventory control. Criteria for judging inventory system. Inventory management in India. Storage and Warehousing. Inventory record keeping and their types. Risk-Meaning, importance and types, minimization of risks.

PRACTICALS

Estimation of Economic Order Quantity (EOQ). Estimation of cost of carrying and ordering inventories. Estimation of optimal level of safety stock. Visits to private companies for observing their working in inventory and stock management etc. Hypothetical examples on risk minimisation.

Reference Books

1. Pandey, Mukesh and Deepak Tiwari. Rural and Agricultural Marketing. International Book Distribution Co., New Delhi.
2. Samuel Elison. Elements of Productions Planning and Control, S.A. Shroff, Navneet Prakashan Ltd. Kalbadevi Road, Mumbai 400 002 By arrangement with M/s Universal Publishing Corporation.
3. Acharya, S. S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Co. Ltd., 66, Janpath, New Delhi- 110 001.
4. Prasana Chandra. Financial Management. McGraw Hill Book, New York.

Course No. : ABM – 359

Title : Agro-Tourism

Credit : 2=1+1

THEORY

Agro-tourism: Introduction, importance, scope, forms of agro-tourism, advantages and implementations, introduction to Indian culture. Govt. policies and legislations in respect of tourism and agro-tourism and environment protection laws. Requirements for Agro-tourism. Farm, forest, garden, fish tank/ponds, residential huts, etc. Constraints in operation and management of Agro-tourism activities. Management of resources – Human resources, Natural resources and Garbage management at Agro-tourism centre.

Entrepreneurship development: Role and functions, **Hospitability:** Food and beverages and accommodation services.

Communication skill and service; Capital investment, sources and capital budgeting.

Project proposal- Preparation and feasibility tests, Accounts and record keeping etc. Marketing strategies for Agro-tourism products and services. Publicity of tourism- Advertisement and use of media.

PRACTICALS

Visit to various near by agro-tourism centres.

Study of different types of Agro- tourism centres and services offered by them etc.

Report on agro-tourism project.

Reference Books

Available recent literature and publications, Government policies on Agro-tourism

1. Talwar, Prakash. Travel and Tourism Management. Gyan Books Pvt., Ltd., Main Ansari Road, Darya Ganj, New Delhi- 110 002.
2. Bagri, S. C. Trends in Tourism Promotion 2003. International Books Distributors, 9/3, Rajpur Road, Dehradun-248 001 Uttarakhand (India).

Course No. : ABM - 3510

Title : Production Management, Planning and Control

Credit : 2=1+1

THEORY

Introduction, meaning and role of production management in agriculture. Elements of production, design and process planning. Effect of technological changes on the production management. Factors influencing the plant location in Agri-business activities.

Agricultural Production Planning and Control: Nature, basic functions of production planning and control, its objective, different system of manufacture production cycle, scheduling and control of production and its control procedures and devices. Total quality management, considerations, stage of quality control, standard and specifications, quality assurance and quality circles. Scheduling psychology, methodology and control techniques. Legal aspects of quality control.

Resource Planning and Budgeting: Importance and techniques, methods to study work measurement. Nature and objectives of production planning and control. Variables subject to control. Production control for contentment's, intermittent and project system. Production forecasting and production inventories. Aggregate planning, guidelines, graphic and chart planning.

Resource Management: Management of resources: Meaning, concept, source of supply of material, selection and evaluation, purchase management-Cost reduction. Store Management-location, storage methods and documentation of Government policies.

PRACTICALS

1. Study of production management aspects of selected agri-business units.
2. Visit to selected agri-business units
3. Discussion with entrepreneurs.
4. Points to be considered while preparing the reports on agri-business management.
5. Layout - example of large enterprise that consist of many small and medium plants.
6. Scheduling a planning function and expedition control function of small firms.
7. Preparation of memorandum, explaining merits of COS and outline how the changeover is going to take place and define the responsibility of each section in the new organization.
8. Production planning and control: Nature, basic function of production planning and control, its objective, variants in different system of manufacture production cycle.

9. Resource planning and budgeting – Importance and technique, work study, method of study, work measurement.
10. Source of supply of material – selection and evaluation.
11. Purchase management – Cost reduction, stores management, location storage method and documentation.
12. Institutions engaged in providing service/ facilities.
13. Government polices.
14. Production control for contemns, entrepreneurs and project system.
15. Production forecasting and production inventories
16. Total quality management, considerations. Stages of quality control. Quality control standards, specifications, quality assurance and quality circles.

Reference Books

1. Samuel Elison. Elements of Productions Planning and Control, S.A. Shroff, Navneet Prakashan Ltd. Kalbadevi Road, Mumbai 400 002.
2. Gupta, S. P. Statistical Methods, S. Chard and Sons, New Delhi.

Course No. : ABM-3511

Title : Agro-Processing Management

Credit : 2=1+1

THEORY

Role of agro-processing industries in the Indian economy. Status and potential of Indian Agro-processing industries. Foodgrains, commercial crops, fruits and vegetable processing, livestock processing, fishery product etc. A policy environment of agro-processing industries- Development, management structure and communication. Work performance efficiency, public contact and public participation in agro-processing industries. Decision making process and entrepreneurial efficiency. Government policies relating to agro-processing unit. Interdependence of agro-processing industries, Problem of agro-processing units. Guideline for financing of agro-processing industries in India.

PRACTICALS

Preparation and follow-up of proposals of processing units like Ginning and Pressing, Spinning mills, Oil mills, Dal Mills, Sugar factories, Milk processing units, Wine making units etc. Exercises on economics of processing of agricultural commodities. Study of agro-

processing industries of different commodities - Foodgrains, Fruits, Vegetables, Milk and Milk products etc.

Reference Books

1. Srivastava, U.K. Vathsala. Agro-processing Strategy for Acceleration and Exports. Oxford University Press YMCA, Library Building, Jai Singh Road, New Delhi -110001.
2. Rajagopal. Organizing Rural Business Policy Planning and Management. Sage Publication, New Delhi.
3. Pandey, Mukesh and Deepak Tiwari. Rural and Agricultural Marketing. International Book Distribution Co. New Delhi.
4. Diwase, Smita. Agri-Business Management. Everest Publishing House, Everest Lane, 536, Shaniwar Peth, Appa Balwant Chowk, Pune – 411030.

Course No. : ABM- 3512

Title : Marketing Management and Policies

Credit : 2=1+1

THEORY

Understanding Marketing Management, Marketing concept, Marketing mix, Market segmentation and Market targeting. Building consumers satisfaction, value and retention. Managing the marketing process and market planning. **Development of marketing strategies:** Positioning and differentiating the market offering through the product life cycle. Developing new market offerings. Designing global market offerings. **Shaping the market offerings:** Setting the product and brand strategy. Designing and Managing Services. Developing price strategies and programme. New economic policies for agriculture sector.

PRACTICALS

Case Studies on marketing strategies of different agro-based products. Case Studies on “Managing the Product Life Cycle”. Study on different marketing activities carried out by different Companies. Visit to advertising agencies promoting agro-based product etc.

Reference Books

1. Ramaswamy, V. S. and S. Namakumari. Marketing Management – Planning, Implementation and Control. MacMillan Co. 866, Third Avenue, New York – 10022.
2. Kotler, Philip. Marketing Management. Pearson Education, Delhi. The laws State College Press, Ames, Iowa, USA
3. Kahlon, A. S. and M.V. George. Agriculture Marketing and Price Policies. Allied Publishers Pvt. Ltd., 13/14, Asaf Ali Road, New Delhi-110002.
4. Singh, L.S. Agriculture Price Policy and Stabilization Measures in India Delhi.

5. Acharya, S. S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Co. Ltd., 66, Janpath, New Delhi- 110 001.

SEMESTER - VI

Course No. : PATH - 362

Title : Bio-fertilizers and Mushroom Production

Credit : 2=1+1

THEORY

Bio-fertilizers: Meaning, definition and importance. Types of bio-fertilizers. Types of micro-organisms. Phosphate solubilising micro-organisms. Nitrogen fixation by Microorganisms (Azotobacter, Azospirillum, Rhizobium, Acetobacter, Blue green algae and Azolla,), VAM (*Vesicular Arbuscular Mycorrhiza*), Application of bio-fertilizers. Efficiency of bio-fertilizers, Role of bio-fertilizer in nutrient availability and soil fertility. Beneficial role of microorganism. Harmful microorganism in plant growth. Economics of bio-fertilizer production.

Mushroom production: Introduction, types of mushroom. Study of morphology and nutritional importance of mushroom. Material and equipment required for commercial cultivation of mushroom. Harvesting, packing, marketing and preservation of mushroom. Different recipes of mushroom. Economics of mushroom cultivation.

PRACTICALS

1. Preparation of vermi composting unit.
2. Preparation of culture media.
3. Preparation of master and commercial spawn of *Agaricus sp.*, *Pleurotus sp.* and *Volvariella sp.*
4. Cultivation of Oyster mushroom, button and paddy straw mushroom
5. Economics of mushroom cultivation

Reference Books

1. Bahal, Nita. Handbook on Mushroom. Oxford IBH Publication Company. New Delhi.
2. Chang, S.T. and C.S. Mites. Edible Mushroom and their Cultivation. CBS Publications, Delhi.
3. Kapoor, J.N. Mushroom Cultivation. IARI, New Delhi.

4. Somani, L.L. and Subha Rao. Bio-fertilizers. Scientific Publisher, Jodhapur

Course No. : ECON- 369

Title : Planning, Formulation and Evaluation of Business Projects

Credit : 3=1+2

THEORY

Agriculture Project: Meaning, types and their importance in development. Economic and financial analysis of agricultural projects. Cost-benefit estimates of different types of projects, Cash-flow, Shadow price, calculation of economic prices, comparing costs and benefits such as the Net Present Worth (NPW or NPV), the Benefit Cost ratio (BCR), Internal Rate of Returns (IRR), Cash flow, Pay Back Period (PBP). Guidelines for building up cost and return analysis, project area, characterization and components, financial and economic analysis. Project approach to agricultural leading enterprises practical steps in project formulation. Financial appraisal of a project. Application of Programme Evaluation and Review Technique (PERT,CPM), Sensitivity analysis, Social Cost Benefit Analysis (SCBA).

PRACTICALS

Practical exercises on project preparation for securing loan. Estimation of measures of economic evaluation such as NPV, BC ratio, Internal Rate of Returns (IRR), Pay Back Period (PBP). Sensitivity analysis to judge the economic viability of a project. Complete project proposal. Exercises on CPM and PERT techniques.

Reference Books

1. Prasana Chandra. Project Planning Analysis, Selection, Implementation and Review. Tata Mac Graw Hill Publication Co., New Delhi
2. Barde, S. D. and K. G. Karmkar. Agricultural Project Management for Banks. Popular Prakashan, Pandit Madan Mohan Malviya Marg, Mumbai – 400 038.
3. Johl, S. S. and Charles. V. Moore. Essentials of Farm Financial Management. Today and Tomorrow's Printer and Publishers – 22 B-5, Original Road, Karol Baugh, New Delhi – 110 005.
4. Kahlon, A. A. and Karam Singh. Managing Agricultural Finance - Theory and Practice. Allied Publisher Pvt. Lt., 165, J. N. Heredia Marg Ballard Estate, Mumbai – 400 038.

5. Machiraju, H R. Project Finance, Vikas Publishing House Pvt. Ltd., Delhi.

Course No. : ECON-3610

Title : Financial Management in Agri-Business

Credit : 3=2+1

THEORY

Agriculture Finance: Nature and scope, importance of agriculture finance. Agricultural finance as a part of public finance. Source of capitals: Meaning and concept of agriculture credit, classification and forms of credit. Credit as a tool of economic development. Cost of credit, interest rates of credit, 3 R's, 5 C's and 5 P's of credit. Credit rationing and planning. Legal aspects of credit, supervised credit. credit demand and supply, credit institution, credit policy and needed changes. Preparation of proforma of income statement, proforma of balance sheet and cash budget. Portfolio management, financial ratio analysis, Break-even analysis. Investment analysis. Capital market. Operations analysis.

PRACTICALS

3 R's, 5 C's and 5 P's of Agriculture credit. Financial ratio analysis: Liquidity ratio, Leverage ratios, Turnover analysis, Profitability ratios, Valuation ratios with their example, Comparative analysis. Application of financial statement analysis, Break-even analysis, Investment analysis.

Reference Books

1. Patnkar, S.V. Financial Management. Everest Publishing House Everest, Pashuram Apartment, 12, Sankalp Society, Paud Phata Road, Opp. Jog Hospital, Pune- 411 038.
2. Jain, S.C. Management in Agriculture Finance. Vora and Company. Publishers Pvt. Ltd., 3 Round Building, Kalbadevi, Mumbai – 400 002.
3. Prasana Chandra. Financial Management. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
4. Kahlon, A. A. and Karam Singh. Managing Agricultural Finance - Theory and Practice. Allied Publisher Pvt. Lt., 165, J. N. Heredia Marg, Ballard Estate, Mumbai – 400 038.

Course No. : MKT- 369

Title : Trading of Agricultural Commodities-II

Credit : 2=1+1

THEORY

Marketing of commercial crops with special reference to all marketing functions and price analysis. Commercial commodities - cotton, sugarcane, onion, grapes, banana, citrus, mango, cut flowers –roses, gerbera, gladiolus, etc. vegetables – cauliflower, cabbage, tomato, potato, ladies finger, brinjal. Existing levels of processing and future potential. Export and export potential.

PRACTICALS

Practical exercises on performance of various marketing functions of selected commercial crops. The estimation of marketing cost, market margins and producer's share in these commodities. Visits to various commodity markets, processing units and their detail studies.

Reference Books

1. Acharya, S. S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Co. Ltd., 66, Janpath, New Delhi. 110 001.
2. Mamoria, C.B. and R.L. Joshi. Principles and Practices of Marketing in India. Kitab Mahal, 15, Thorn Hill Road, Allahabad.
3. Panvar, J.S. Beyond Consumer Marketing. Response Books Sage Publications, New Delhi.

Course No. : MKT- 3610

Title : Market-Led Extension

Credit : 2=1+1

THEORY

Meaning, definition and importance of market-led extension. Areas of extension education in marketing. Extension education methods. Privatisation of extension services. Factors affecting efficiency of extension. Phases of agricultural extension in India. Stages in promoting marketing extension. Limitations of traditional extension method. Cyber extension and its important tools. Role of world wide web in extension activities.

PRACTICALS

Study of APMC with reference to market led extension activities.

Assessment of training needs of the farmers with reference to marketing of farm produce.

Study of various private extension approaches.

Reference Books

1. Acharya, S. S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Co. Ltd. 66 Janpath, New Delhi. 110 001.
2. Pandey, Mukesh and Deepak Tiwari. Rural and Agricultural Marketing. International Book Distribution Co., New Delhi.

Course No. : ABM- 3613

Title : Product Promotion Methods

Credit : 2=1+1

THEORY

Product Promotion: Meaning and importance, pricing, promotional policies and practices. Market communication. **Planning:** Planning in marketing managerial process, steps and strategic options. Product differentiation and product positioning. **Product Marketing:** Market segmentation of consumer and industrial markets, selecting and promoting target markets. **Product-mix:** meaning, classification, life cycle and components. Marketing channels- Meaning, push and pull strategies. Promotion skills of wholesalers and retailers. **Product Pricing:** Definition, price-mix, pricing strategies and communicating prices. Psychology of human behaviour in product promotion - culture and sub-culture, values of consumer behaviour, social groups. Organizational buying, message-source, structure, varieties and contents etc. **Advertising:** History, definition, classification, function and organization of advertising campaign. Elements, objectives and designing of advertising strategy and opportunities. Measuring advertising performance. Sales promotion, planning, objectives, techniques of consumers' promotion management. Sale force trade promotions and public relations, sales promotion effect.

Product Selling: Personal selling, types, process and models. Managing sales force, personal selling and promotion mix, preliminary considerations in planning. Framework, strategies in international marketing, major players in international markets, promoting and international strategies.

PRACTICALS

Study the promotion skills of wholesalers and retailers. Study the promotion strategies implemented by various agri-based companies for different agricultural commodities and their products (Foodgrains, fruits, milk and milk products, etc.). Study the role of advertising in Agriculture sector.

Reference Books

1. Samuel, Elison. Elements of Productions Planning and Control, Navneet Prakashan Ltd. Kalbadevi Road, Mumbai 400 002, By arrangement with M/s Universal Publishing Corporation.
2. Burnett, John J. Promotion Management. Virender Kumar Arya for A.I.T.B.S Publisher and Distributor (Regd.) J-5/6 Krishan Nagar, Delhi – 110 051.
3. Kotler, Phillip and Gary Armstrong. Principles of Marketing. Prentice- Hall of India Pvt. Ltd, New Delhi – 110 001.
4. Acharya, S.S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Company Pvt. Ltd. 66, Janpath, New Delhi – 110001.
5. Diwase, Smita. Agri-Business Management. Everest Publishing House, Everest Lane, 536, Shaniwar Peth, Appa Balwant Chowk, Pune – 411030.

Course No. : ABM- 3614

Title : Organizational Behaviour

Credit : 2=2+0

THEORY

Organization and its analysis: Nature of organization, scope and significance of organization behaviour, relevance of Organizational Behaviour (OB) in today's business environment.

Individual Dimensions of Organizational Behaviour: Nature of human behaviour, perception, learning and behaviour modification. Personality, attitudes, motivation, socio-cultural factors and behaviour dynamics of groups.

Interactive Dimension of Organizational Behaviour: International behaviour, group dynamics and behaviour, power, authority, and politics, leadership, communication, organizational conflicts, organizational climate.

Structural Dimensions of Organizational Behaviour: Organization theory. Determinants of organization structure, designing of organization structure, forms of organization structure, bureaucratic organization.

Organizational Effectiveness and change: Organizational effectiveness, organizational change and development. Major forces of change, types of change, reaction to change, developing support for change.

Reference Books

1. Korman, Abhraham K - Organizational Behaviour
2. Singh and Chhabra - Organization Theory and Behaviour
3. Khanka ,S. S. Organizational Behaviour

4. Maslow, A. H. Motivation and Personality
5. Stephen, P. Robbins. Organizational Behaviour

Course No. : ABM- 3615
Title : Managerial Accounting
Credit : 2=1+1

THEORY

Finance- Concept, its relationship with other functional areas. Cash budgeting. Proforma of income statement and balance sheet, estimation and management of working capital, inventory accounts. Capital budgeting, cost of capital, appraisal of applications for term loans, management for earning dividend. Determination of dividend and profit. Preparation of trial balance. Cost Accounting - Relationship with financial accounting. Elements of cost - preparation of cost sheet. Materials cost- Materials purchasing, receiving, storing, issuing including pricing of issues. Labour Cost - time keeping and time booking, idle time, and labour turnover.

PRACTICALS

Balance sheet analysis, income statement and incremental income. Examples on dividend and profit determination. Case studies on term loans. Exercise on inventory management (Role and Function). Exercise on cost accounting. Exercise on trial balance etc.

Reference Books

1. Horngreen and Sundlem. Introduction to Management Accounting.
2. Man Mohan and Goyal. Principles of Management Accounting.
3. Inamdar, S.M. Cost and Management Accounting.
- 4 Kulkarni, Mahesh. Management Accounting.
5. Grewal, T.S. Double Entry Book Keeping.
6. Khan and Jain. Cost Accounting.
7. Khan and Jain. Theory and Problems in Management and Cost Accounting.

Course No. : ABM- 3616
Title : Market Survey and Price Analysis
Credit : 2=0+2

PRACTICALS

Price analysis, importance of prices, trends and fluctuations of prices in agriculture and their impact. Price determination in Agricultural Products. Agricultural Price policy in India.

Minimum support price, procurement price, administered price, statutory price, market price, market intervention price. Procedure for determining MSP and trends in MSP over decade. Price parity. Behaviour of agricultural prices, input factor prices in agriculture. Vertical integration and horizontal integration. Price discrimination. Study of arrivals and prices of major farm products. Trends in production. Effects of prices on area allocation in agriculture. **Marketing Research:** Process, problem, definition, research objectives, research design. Sources of data, data collection, data analysis, report and presentation.

Reference Books

1. Ramaswamy, V. S. and S. Namakumari. Marketing Management, Planning, Implementation and Control. MacMillan Co. 866, Third Avenue, New York – 10022.
2. Acharya, S.S. and N.L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Company Pvt. Ltd. 66, Janpath, New Delhi – 110001.

SEMESTER - VII

Experiential Learning

(A batch of 4 to 5 students will work in one group)

A. Compulsory Module (Any one)

Course No. : MKT-4711

Title : Marketing of Agricultural Products

Credit : 10=0+10

Objectives

1. To study the various agencies involved in the marketing of agricultural products.
2. To examine the various functions carried out by these agencies in the marketing of the agricultural products.
3. To estimate the cost of marketing and price spread for selected agricultural products.
4. To study the problems in the marketing of various agricultural products

Programme: To identify the agricultural products which have marketable and marketed surplus in the locality. Select one or two agricultural products for, detailed study of marketing with appropriate (10-30) sample cultivators. Analyse the information as per the objectives. Report writing .

Analytical tools (to be used): Standard techniques to be used in estimation of marketing cost and price spread.

Financial provision: Provision of financial aid for visiting the cultivators and markets will be made by the concerned institute.

Information proforma: To be provided by the institute.

Course No. : MKT-4712

Title : Marketing of Agricultural Inputs

Credit : 10=0+10

Objectives

1. To enlist the various agricultural inputs required in agricultural production.
2. To study the channels in procurement and distribution of major agricultural inputs.
3. To study the trends of supply, demand and prices of selected agricultural inputs (one or two).
4. To examine the various Govt. policies pertaining to use of various agricultural inputs.

Programme: Students will study the various agricultural production systems and the major inputs used in their production. By visiting the various suppliers of agricultural inputs, students will trace their channels. They have to visit the various Govt. agencies, markets for getting acquainted with the Government policies in respect of various inputs.

Analytical tool: Not required

Financial provision: Financial provision will have to be made for the visit by the concerned institute.

Information proforma: Not required.

Course No. : ABM-4717

Title : Production and Marketing of Crops Produced under Protected Cultivation

Credit : 10=0+10

Objectives

1. To obtain the information on types of protected cultivation units in the study area and the crops grown therein.
2. To work out the cost of erection of selected protected cultivation units and its management.
3. To estimate the cost of production of crops grown in the Unit.
4. To study the marketing of crops grown and their profitability.
5. To study the problems in management of production and marketing of crops.

Programme: The student will select the specific protected cultivation unit from among the list of the surveys made. All the information pertaining to erection of protected cultivation unit from the manager/owner will be collected along with management practices carried out

by the farm unit in raising and marketing of the crops. The report indicating the management functions, cost estimates and profitability of the crop/unit will be prepared.

Analytical tools (to be used): For estimation of cost of production, amortization technique will have to be used by the students. Students have to use the financial feasibility indicators like B: C ratio, IRR, PBP, etc.

Financial requirement: Provision for visiting the protected cultivation units and back for the period will have to be made by the concerned institute/ college.

Information proforma: The specific proforma will be provided to the students.

Course No. : ABM-4718

Title : Commercial Production of Livestock Units

Credit : 10=0+10

Objective

1. Survey of dairy units, goat and sheep rearing units and poultry units in selected region.
2. Study of specific units with regards to size, number of animals/birds reared, their managements etc.
3. To estimate the cost of production, details of marketing and profitability of unit.
4. To examine the physical and economic efficiency of livestock production units.
5. To study the problems in production and marketing and suggest solutions.

Programme: After complete survey of commercial production unit in selected area, students in a batch will be asked to choose the unit of their liking under the guidance of concerned course teacher. Then students will visit these units throughout the semester for collection of data pertaining to production, cost and marketing of livestock products. He will workout all the costs, efficiency parameters etc. at the end of semester under the guidance of concern specialist. The report fulfilling all the objectives of experiential learning programme will be submitted at end of semester.

Analytical tools (to be used): (1) Financial feasibility analysis-profitability, B: C ratio, break- even point, etc. (2) Market efficiency estimation methods.

Financial requirements: Financial provision for frequent visits to livestock units will have to be provided by the College.

Information Proforma: The specific information, proforma will be supplied to the students.

Course No. : ABM-4719

Title	: Processing and Value Addition of Fruits and Vegetables
Credit	: 10=0+10

Objectives

1. Acquaintance with the processing units (fruits/vegetables).
2. Study the backward channels in supply of raw materials and other inputs required for the firm.
3. To examine the processing method, packing, grading and storage etc. undertaken by the firm.
4. To study the details of marketing of processed products.
5. To estimate the cost of production, price spread and value addition for the products under study.
6. To examine problems and constraints in value addition for the firm and suggest the solutions.

Programme: The students in a predetermined batch will visit the processing firm regularly during the semester. They will collect the information pertaining to the processing of the product by the firm right from collection of raw materials or inputs required in the processing till the processed products are sold or distributed to the users or consumers. At the end, they will finalize the report taking into consideration the objectives of the experiential learning programme.

Analytical tools (to be used): 1) Use of standard cost concepts (2) Market margin and price spread analysis, and (3) Financial feasibility indicators like B: C ratio, pay back period, IRR and break-even point analysis.

Financial requirement: Students should be provided the financial help to visit the firm frequently. If possible, vehicle arrangement be made to take the students to the factory area and back.

Information proforma: The specific information proforma will be supplied to the students.

Course No.	: ABM-4720
Title	: Commercial Production of Seed
Credit	: 10=0+10

Objectives

1. To understand the procedure required for undertaking production of selected seed.

2. To study the management and resource use in commercial seed production.
3. To estimate the cost of production and profitability.
4. To examine the details of marketing and study the problems if any in production and marketing.

Programme: A batch of students will be assigned to choose the commercial seed production units (may be two or three) in the identified areas for single crop. They will collect all the information in the prescribed proforma. The data will be analysed for fulfilling the specified objectives and the descriptive/ subjective test will be conducted under the guidance of the concerned course teacher. The report fulfilling all the objectives with special reference to Agri-business Management will be submitted.

Analytical tools (to be used): 1) The standard cost concept for estimating the cost of production to be used, and 2) Profitability along with B:C ratio, efficiency parameters (for human resource, material resource) will have to be estimated.

Financial requirements: Nil

Information proforma: The specific information proforma will be supplied to the students.

Course No. : ABM-4721

Title : Commercial Management of Nursery

Credit : 10=0+10

Objectives

1. To examine the location of the nursery and factors responsible there of.
2. To study the resource needs and assets required for establishment of the nursery.
3. To study the backward and forward linkages in supply, production and distribution of nursery products.
4. To estimate the cost of production, management and profitability of major seedlings unit as a whole.
5. To study the constraints involved in the management of nursery.

Programme: The students will undertake the survey of various nurseries in the given jurisdiction. Selection of nursery in consultation with the course teacher will be carried out. They will collect the information frequently and throughout the semester on production, management and marketing management of major seedlings in the unit. Similarly, they will

seek the information on backward and forward linkages pertaining to that nursery from the manager/owner, and will prepare the final report.

Analytical tools (to be used): Cost and return analysis to be carried out with the help of standard cost concept.

Financial requirement: Provision for visiting the nursery will have to be made by the institute, either through vehicle or by giving T. A. to students.

Information Proforma: The students will be provided required proforma for collection of data.

Course No. : ABM-4722

Title : Extension Techniques for Transfer of Technology

Credit : 10=0+10

Objectives

1. To study the various extension techniques in transfer of agricultural technologies.
2. Identification of proper extension techniques for appropriate technologies.
3. Application of selected technologies to target group.
4. To examine the problems in transfer of technologies to target groups.

Programme: The students will visit the University Extension Department, Department of Agriculture (MS), Agricultural Extension wing and some private agricultural firms/companies/NGOs, etc. to get acquainted with various agricultural extension techniques being used in transfer of technologies. They will select one of the extension techniques and follow its application in consultation with the course advisor. At the end of the semester, they will submit the report.

Analytical tools (to be used): Not required

Financial requirements: Provision of material for use of selected extension techniques and provision of transport facilities upto target rout destination, will have to made.

Information proforma: Concerned Course Adviser of the college will develop the appropriate proforma be used by the students.

Course No. : ABM-4723

Title : Study and Management of Agrotourism Centres

Credit : 10=0+10

Objective

1. To enlist the various types of Agrotourism centers in the jurisdiction through survey alongwith facilities there in.
2. To examine the various resources required for management and running of an agrotourism center.
3. To estimate the cost of management of Agrotourism center and determine the returns from the business.
4. To analysis the perceptions of tourists towards the center.

Programme: The students will select specific group of Agrotourism centers from among the surveys they have made. They will collect the data throughout course of the study regarding number and type of tourists arriving, their demands, peak period, their interaction, resources available at center etc. For this, he may take help of Government Tourism Corporation for understanding some of concepts of Agrotourism. At end, he will prepare the report of the project by highlighting all the aspect specified in the project objectives.

Financial requirement: The provision for visit to various Agrotourism centers will have to be made by the institution or providing travelling allowance to students.

Analytical tools (to be used): Standard project cost concepts, financial feasibility parameters like, B: C ratio, IRR and PBP etc.

Information Proforma: The specific information proforma will be supplied to the students.

B: Optional Courses

Course No. : MKT-4713

Title : Agricultural Export Procedures and Exim Policies

Credit : 3=0+3

Agricultural export procedure: Selection of proper commodities for export. Backward linkages in production areas for achieving desired exportable produce.

Mode of export: Individual, through group, through private exporters, through corporations or through Govt. agencies.

Export documentation: Licensing, primary documents required for exports from different agencies. Export Promotion Councils and their role.

EXIM policies: Past and present Exim policies, canalisation, quota permit system, tariffs, trade barriers etc.

Reference Books

1. Publication and Report of Maratha Chamber of Commerce, Industries and Agriculture, Pune.
2. Central and State Government Resolutions and Circulars issue from time to time.

Course No. : MKT-4714

Title : Demand Forecasting, Price Analysis and Future Trading

Credit : 3=0+3

Demand: Graphical, tabular and functional presentation. Linear form of demand function. Parameter estimation of demand function. Projection/forecasting based on demand function.

Price analysis: Component of time series analysis. Trend, seasonal, cyclical and irregular fluctuations. Different methods for analysis of time series price, data, index numbers and moving average, etc. Future Trading: Importance, working and relevance in the present context.

Reference Books

1. Shephard, G. S. and G.A. Fuetrelal. Marketing Farm Products-Economic Analysis. The Iowa State College Press, Ames, Iowa, U.S.A.
2. Acharya, S. S. and N. L. Agrawal. Agricultural Marketing in India. Oxford and IBH Publishing Company Pvt. Ltd., 66, Janpath, New Delhi - 110001.
3. Visit to the commodity Exchange Market in the jurisdiction.

Course No. : MKT-4715

Title : Supply Chain Management (SCM)

Credit : 3=0+3

Meaning, importance. Models of Supply Chain Management (SCM.). Buying plans. Issues in distribution, location of depot, transport, routine inventory management. Use of IT (Information Technology) in SCM. Case studies of selected Agri-business firms.

Reference Books

1. Chopra, Sunil. Supply Chain Management Strategy, Planning and Operation. Prentice Hall, H.O. 482, FIE, Pratapganj, Delhi-92
2. Hasty, Ron and James Rearda. Retail Management. McGraw Hill Co., New Delhi.
3. Frazzle, Edward H. Supply Chain Strategy. Tata McGraw Hill Publisher, New Delhi.

Course No. : MKT-4716

Title : Retail Management of Agricultural Products

Credit : 2=0+2

Retailing concept. Types of retailers- Departmental stores, Super markets, Factory outlets, etc. Non-store retailing. Marketing decisions. Retail organizations-Cooperative chain stores,

voluntary chains, co-operatives, franchises etc. Studies of existing retailing stores in the locality.

Reference Books

1. Philip Kotler. Marketing Management. Pearson Education Publishers, New Delhi.
2. Swapnapradhan. Retail Management. Gibson and Redamani.
3. Panvar, J.S. Beyond Consumer Marketing. Response Books, Sage Publications, New Delhi.
4. Pandey, Mukesh and Deepak Tiwari. Rural and Agricultural Marketing. International Book Distribution Co., New Delhi.

Course No. : MKT-4717

Title : Marketing of Aromatic ,Medicinal Plants and Spices

Credit : 2=0+2

Recent entry of aromatic and medicinal plants in the marketing system. Traditional marketing of agricultural produce verses marketing of aromatic and medicinal plants, spices. Role of contract farming and pre-harvest contractors in the marketing of aromatic and medicinal plants and spices. Survey of cultivators, merchants, middlemen, processors involved in the trade of aromatic and medicinal plants, spices. Detailed study of marketing of selected aromatic and medicinal plants and spices.

Reference Books

1. Philip Kotler. Marketing Management. Pearson Education Publishers, New Delhi.
2. Swapnapradhan. Retail Management. Gibson and Redamani.
3. Panvar, J.S. Beyond Consumer Marketing. Response Books, Sage Publications, New Delhi.
4. Pandey, Mukesh and Deepak Tiwari. Rural and Agricultural Marketing. International Book Distribution Co., New Delhi.

Course No. : MKT-4718

Title : Management of Kiosks

Credit : 2=0+2

Kiosks- Meaning. Importance of Kiosks in agricultural sector. Working and functioning of Kiosks. Application of Kiosks in agricultural sector, e.g. Supply of prices, arrivals, demand and production and weather data. Study of selected Kiosks in the region.

Reference Books

Recent research articles related to e-commerce and information technology books.

Course No. : MKT-4719

Title : Marketing of Organically Produced Commodities

Credit : 2=0+2

Importance of organically produced commodities in recent years. Marketing of organically produced agricultural products. Supervision, registration, certification of organic products/farms. Institutions/Agencies involved in the marketing of organic products. Detail studies of marketing of selected/ few organic products in the region.

Reference Books

1. Panvar, J.S. Beyond Consumer Marketing. Response Books, Sage Publications, New Delhi.
2. Pandey, Mukesh and Deepak Tiwari. Rural and Agricultural Marketing. International Book Distribution Co., New Delhi.

Course No. : ABM-4724

Title : Management of Agro service Centers

Credit : 3=0+3

Concept of agro service centres. Location, selection of agro-service centres. Services to be rendered including input supply, consultancy services etc. Backward linkages in procurement of agricultural inputs, technical know-how etc.

Reference Books

1. Diwase, Smita. Agri-Business Management. Everest Publishing House, Everest Lane, 536, Shaniwar Peth, Appa Balwant Chowk, Pune – 411030.
2. Broadway, A. C., Arif A. Broadway. A Text Book of Agri-Business Management. Kalyani Publishers, New Delhi.

Course No. : ABM-4725

Title : Agricultural Finance Proposals and Management

Credit : 2=0+2

Types of agricultural finance institutes- co-operatives, commercial, Government etc. Types of agricultural credits (Short, medium and long terms) and other types (based on purpose, mortgage, etc.) loans. Different types of agricultural finance proposals: Crop loans, Livestock/Dairy development loans, Purchase of agricultural machineries etc. Study of documents required for various agricultural finance proposals. Examination of various loan proposals sanctioned by various financing institutions etc. Study of monitoring and supervision of these credit/loans sanctioned by the institutions.

Reference Books

1. Patnkar, S.V. Financial Management. Everest Publishing House Everest, Pashuram Apartment, 12, Sankalp Society, Paud Phata Road, Opp. Jog Hospital, Pune- 411 038.
2. Jain, S.C. Management of Agriculture Finance. Vora and Company. Publishers Pvt. Ltd., 3, Round Building, Kalbadevi, Mumbai – 400 002.
3. Prasana Chandra. Financial Management. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
4. Kahlon, A. A. and Karam Singh. Managing Agricultural Finance - Theory and Practice. Allied Publisher Pvt. Lt., 165, J. N. Heredia Marg, Ballard Estate, Mumbai – 400 038.

Course No. : ABM-4726

Title : Group Sale Management

Credit : 2=0+2

Concept of ‘Group sales’ and comparison with cooperative marketing societies. Advantages and disadvantages of Group sales. Agricultural produce sold through group sale e.g. grapes, banana, pomegranate, vegetables etc. Study of functioning of selected samples of Group sales. Problems, feedbacks of these groups with regard to their activities etc.

Reference Books

Recent research articles related to Group Sale Management.

Kapoor, D. C. Marketing and Sale Management. S. Chand and Co., Ltd.,7361, Ram Nagar, Qutab Road, New Delhi-110 055.

Bhattacharyya, S. K. Logistics Management. S. Chand and Co., Ltd.,7361, Ram Nagar, Qutab Road, New Delhi-110 055.

Course No. : ABM-4727

Title : Contract Farming Management

Credit : 2=0+2

Contract farming (CF): Meaning, relevance to agricultural marketing. Provisions of Contract Farming in New Market Act, 2007. Crops (fruits/vegetables/aromatics and medicinal plants etc.) covered under CF. Types of contract farming. Advantages and disadvantages of CF. Survey of contract farming undertaken for various crops in the locality. Case study of selected CF. in the locality.

Reference Books

1. Sharma, Premjit. Contract Farming. Gene- Tech Books 4762-63/23, Ansari Road, Darya Ganj, New Delhi-110 002
2. Singh, Sukhpal. Contract Farming and the State: Experiences of Thailand and India. Kalpaz Pub, Delhi.

Course No. : ABM-4728

Title : Natural Resources, Economics and Market Management

Credit : 3=0+3

Natural resources and their use in agriculture. Development and conservation of natural resources. Management of various natural resources e.g. water management, land management, forest preservation etc. Study of natural resources and ecological balance.

Reference Books

1. Agrawal, A.N. Indian Agriculture: Problems, Progress and Prospects. Vikas Publishing House Pvt. Ltd., Delhi.
2. Matoria, C.B. Agricultural Problems of India. Kitab Mahal, Allahabad.
3. Owen Oliver. Natural Resource Conservation and Ecological Approach. MacMillan Co. 866, Third Avenue, New York – 10022.

Course No. : ABM-4729

Title : Project Formulation, Evaluation and Monitoring

Credit : 2=0+2

Identification of proper agricultural projects e.g. Polyhouse for cut- flowers, sericulture, poultry, dairy, oil extraction, rice or dal mills, fruit processing unit for case study. Preparation of project plan. Cost components and their estimation. Technical and financial evaluation of project through various parameters/indicators, viz; B: C ratio, pay-back period, IRR etc. Methods followed in monitoring of the project. Case studies of selected agricultural projects with reference to economic indicators.

Reference Books

1. Prasana Chandra. Project Planning, Analysis, Selection, Implementation and Review. Tata McGraw Hill Publication Co., New Delhi
2. Barde, S. D. and K. G. Karmkar. Agricultural Project Management for Banks. Popular Prakashan, Pandit Madan Mohan Malviya Marg, Mumbai – 400 038.
3. Johl, S. S. and Charles. V. Moore. Essentials of Farm Financial Management. Today and Tomorrow's Printer and Publishers – 22 B-5, Original Road, Karol Baugh, New Delhi – 110 005.
4. Kahlon, A. S. and Karam Singh. Managing Agricultural Finance - Theory and Practice. Allied Publisher Pvt. Lt., 165, J. N. Heredia Marg Ballard Estate, Mumbai – 400 038.
5. Reddy, S. Subha and P. Raghu Ram. Agricultural Finance Management. Oxford and IBH, New Delhi.
6. Gittenger, J.P. Economic Analysis of Agricultural Projects. John Hopkins, University Press, London.

Course No. : EXTN-472

Title : Agricultural Journalism

Credit : 3=0+3

Journalism- Concepts, types, agriculture journalism. Acquaintance of news papers, magazines, weekly in agriculture. Methods of writing the agricultural literature for publication. Preparation of news for publication in various daily's, news letters. Role of electronic media in agricultural journalism.

Reference Books

1. Spencer, Crump. Fundamentals of Journalism. McGraw Hill Co., New Delhi.
2. Astor, J.J. Art of Modern Journalism. Akashdeep Publisher House, Delhi.
