Semesterwise courses layout of B.B.A. (Agri.)

Semester- I

Course No.	Title of the Course	Credits
AGRO-111	Agro-Techniques of Principal Crops and Agro-Metereology	3=2+1
HORT- 111	Production Management of Important Fruit Crops	2=1+1
BOT-111	Principles of Plant Biotechnology	2=1+1
COMP- 111	Introduction to Computer Application	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
	Total	**16=10+6**
	Non Credit Courses*	
MATH-111 / BIO-111	Mathematics *OR* Biology	2=1+1 / 2=2+0
LANG-111	Comprehensive and Communication Skills in English	2=1+1
PEDN-111	Physical Education	1=0+1
NSS-111 / NCC-111	NSS OR NCC	1=0+1 / 1=0+1

Semester- II

Course No.	Title of the Course	Credits
AGRO-122	Farming Systems and Sustainable Agriculture	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	Entrepreneurship and Personality Development	2=2+ 0
ECON-123	Farm Business Management	2=1+1

ECON-124	Money, Banking and International Trade	2=1+1
MKT-121	Introduction to Agricultural Marketing	2=1+1
ABM-122	Agro- based Industrialization	2=2+0
	Total	**20=13+7**

Semester-III

Course No.	**Title of the Course**	**Credits**
AGRO-233	Irrigation Water Management	2=1+1
HORT-232	Production, Management of Important 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
ENGG-232	Post-Harvest Technology of Cereals, Pulses, Oilseeds and Cash Crops	2=1+1
PATH-231	Integrated Disease Management	2=1+1
EXTN-232	Communication Skills & Market-Led Extension for Business Management	2=1+1
ECON-235	Agricultural Co-operation, Institutions and Management	3=2+1
MKT-232	Marketing Institutions and Organizations	3=2+1
MKT-233	Input Marketing Management	3=2+1
ABM-233	Office Procedures for Agri-Business	1=0+1
	Total	**24= 12 + 12**

Semester – IV

Course No.	Title of the 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
EXTN-243	Consumers Psychology in Business Management	2=1+1
ECON-246	Indian Agricultural Policies	2=2+0
MKT-244	Rural Marketing and Market Infrastructure	3=2+1
MKT-245	Retail Marketing	3=2+1
ABM-244	Disaster Management in Agriculture	2=1+1
	Total	**20= 13 + 7**

Semester –V

Course No.	Title of the Course	Credits
EXTN-354	Information Technology in Agri- Business	2=1+1
ECON-357	Input-Output Measurement Techniques	2=1+1
ECON- 358	Research Methods in Social Sciences	2=1+1
MKT-356	Trading of Agricultural Commodities-I	2=1+1
MKT-357	Market and Trade Acts	2=2+0
ABM-355	Inventory and Risk Management	2=1+1
ABM-356	Agro-Tourism	2=1+1
ABM-357	Production Management, Planning and Control	2=1+1
ABM- 358	Agro-Processing Management	2 =1+1
ABM-359	Marketing Management and Policies	2=1+1
	Total	**20 = 11 +9**

Semester-VI

Course No.	Title of the Course	Credits
PATH-362	Bio-fertilizers and Mushroom Production	2=1+1
EXTN-365	Organizational Behaviour for Business Management	2=2+0
ECON-368	Planning, Formulation and Evaluation of Business Projects	3=1+2
ECON-369	Financial Management in Agri-Business	3=2+1
MKT-368	Trading of Agricultural Commodities-II	2=1+1
ABM-3610	Agri-Business Operations, HRD and Strategic Management	2=2+0
ABM-3611	Product Promotion Methods	2=1+1
ABM-3612	Managerial Accounting	2=1+1
ABM-3613	Market Survey and Price Analysis	2=0+2
	Total	**20=11+9**

Semester-VIII

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

* Credits for Non Credit courses are not included in the total.

Details of course contents (Semesterwise)

SEMESTER – I

Course No. : **AGRO-111**
Title : **Agro-Techniques of Principal Crops and Agro-Metereology**
Credit : **3=2+1**

THEORY

Agronomy: Definition, scope, basic elements of crop production and factors affecting crop production, classification of field crops, package of practices like area, production, productivity, economic importance, soil and climatic requirement, nutrient requirment, irrigation, water and weed management, seeds and sowing, plant protection measures, harvesting and yield for crops viz., sorghum, paddy, wheat, maize, pearl millet, redgram, green gram, black gram, cowpea, pea, groundnut, soybean, sesamum, sugarcane, gram, red gram, sunflower, safflower, rapeseed, mustard, linseed, castor, potato, tomato, cotton, jute etc. cropping systems.

Agricultural Meteorology: Importance in agriculture, weather and climate, weather elements and factors affecting them, Atmosphere – composition and structure, solar radiation – nature, properties, depletion, factors affecting solar radiation, solar constant and energy balance. Atmospheric temperature, factors affecting temperature, importance, horizontal and vertical distribution in temperature, global warming. Soil temperature – importance, variation with heat. Wind types, classification, and importance in agriculture, forces acting to produce wind, cyclones, anticyclones and general circulation system of earth. Atmospheric humidity – saturated and actual vapour pressure, specific and relative humidity, diurnal variation of humidity, condensation – forms like dew, fog, frost, mist, snow, rain and hail. Cloud – types, formation and classification. Precipitation – process, forms, types of rain – thunder and hail storms. Types of monsoon, agricultural seasons. Drought – classification, strategy to mitigate drought. Evaporation – importance, microclimate, weather forecasting – Basics, types and importance, Remote sensing and introduction to crop modelling.

LESSON PLAN

Lecture No.	Topic Details	Weightage
1.	CROP PRODUCTION**:** Definition, limitations and Strategies. Basic elements of crop production and factors affecting crop production.	10
2.	Food production, food security. Area, production and productivity of food grains in India	10
3.	Classification of field crops. Seeds and Sowing, inter-cultivation, etc	8
4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14	Economic importance, market value, climate, nutrient and irrigation requirement, inter-culturing practices, weed management, major pests and diseases, use of growth regulators. Cropping systems, intercropping and crop rotation. Maturity, harvesting, processing, yield packing, storage and marketing – All these production parameters for crops viz. jowar, paddy, maize, wheat, arhar, gram, greengram, blackgram, pea, cowpea,groundnut,soybean,sunflower,safflower,rapeseed,mustard,linseed, sesamum, castor, sugarcane, potato, cotton, jute etc.	26

15.	Concepts of Weather and climate: Macro and microclimate and scope of Agricultural Meteorology, its importance in agriculture	8
16	Weather and climate, weather elements and factors affecting them. Composition of atmosphere. Stratification of the atmosphere, temperature inversion. Law of radiation	8
19	Law of radiation ,solar constant, spectral distribution, nature, properties,	6
20	Factors affecting solar radiation, radiation balance, net radiation.	6
21	Soil temperature, patterns and profiles of soil temperature, measurements and its application.	4
22	Air temperature, factors affecting temperature, diurnal variation isotherms, Lapse rate, stability and instability.	6
23	Atmospheric pressure, variation with height, isobars, pressure gradients and coriolis force.	4
24	Geostrophic wind. Trade and antitrade winds, low pressure system. Monsoon depression, cyclones and anticyclones. Circulations Beaufort's scale.	6
25	Atmospheric humidity, saturated and actual vapour pressure, absolute, specific and relative humidity, psychometers, diurnal variation of humidity.	6
26	Condensation and its forms, clouds, cloud types, formation and their classification. Precipitation process, forms, types of precipitation: thunder and hailstorms.	6
27	Types of monsoon, agricultural seasons, soil moisture constants, available water, water balance, evapotranpiration, definition, actual and potential evapotranspiration, factors affecting evapotranspiration.	6
28	Climate requirement of important crops. Soil water relationship, physical properties of soil, volume mass relationship.	4
29	Agro-climatic zones of Maharashtra, draught and its classification strategy to mitigate the drought, forecasting.	6
30	Types of weather forecasting, basis and their importance.	4
31	Remote sensing and its importance in agriculture.	4
32	Crop modelling, its types and application.	4

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 layouts. 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, hygrograph, wind measurements. Measurement of rainfall by FRP rainguage, Self-recording rainguage, measurement of evaporation by open pan evaporimeter. Measurement of bright sunshine hours by Compbell Stoke's sunshine recorder. Measurement of soil temperature. Measurement of dew, measurement of pressure. Recording, tabulation and analysis of meteorological data.

Practical No.	Topic	Weightage
1,2	Identification of seed of various crops, manures and fertilizers. Calculation of fertilizer requirement of major crops.	
3.	Cost of production, GMR, B : C ratio of major crops.	
4.	Sowing methods, fertilizer application methods.	
5.	Preparation of irrigation layout.	
6.	Harvesting, threshing, processing, grading, marketing.	
7.	Agromet observatory, types, selection of site and measurement of air and soil temperatures, maximum, minimum thermometers, thermograph, dry bulb and wet bulb thermometers.	
8.	Calculation of vapour pressure and relative humidity.	
9.	Assamns psychrometer, hygrogrph, wind measurement. Measurement of rainfall by FRP rainguage .	
10.	Measurement of evaporation by open pan evaporimeter.	
11.	Measurement of bright sunshine hours by Campbell Stockers sunshine recorder.	
12.	Measurement of soil temperature.	
13.	Measurement of dew, measurement of pressure.	
14.	Recording, tabulation and analysis of meteorological data.	
15.	Practice.	

REFERENCE BOOKS

1. Vaidya, V.G., K.R. Sahasrabuddhe and V.S. Khuspe. Crop Production and Field Experimentation. Continental Prakashan, Pune.
2. Morachan, Y.B. Crop production and management. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Reddy, S.R. Principles of Agronomy. Kalyani Publishers, New Delhi.
4. Mavi, H.S. Introduction to Agro-meteorology. Oxford and IBH Publishing Co., New Delhi.
5. Singh, S. S. Crop Management under irrigated and rainfed condition. Kalyani Publishers, New Delhi

6. Singh S.S. Principles and Practices of Agronomy. Kalyani Publishers, New Delhi.
7. Moracban, Y. B. Crop Production and Management. Oxford and IBH Publisher Co. Pvt. Ltd., New Delhi
8. Reddy, S. R. Principles of Agronomy. Kalyani Publishers, New Delhi
9. Cheema S.S., D.K. Dhaliwal and T.S. Sahota. Theory and Digest Agronomy.
10. Ghadekar, S.R. Meteorology.
11. Lenka, D. Climate, weather and crops in India
12. Kakade, J.R. Agricultural climatology
13. Chhidda Singh. Modern techniques of raising field crops –
14. Rajendra Prasad. Field crops

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Course No. : HORT-111
Title : Production Management of Important Fruit Crops
Credit : 2=1+1

THEORY

Classification of fruit crops on horticultural basis. Importance, present status and future scope for fruit growing in Maharashtra and India. Area and production, export, import scenario of fruit crops and plantation crops in Maharashtra and India. Nutritive value of fruits, importance of selection of site, fencing, planting systems, high density planting, wind breaks and shelter belts in fruit production. Planning and establishment of orchard. Propagation methods and use of rootstocks, methods of training and pruning. Special horticultural practices like bahar treatment, ringing, girdling, bending, notching, etc. Nutrient management, water management, weed control, mulching, intercropping, use of growth regulators in fruit production, physiological disorders in fruit crops. Package of practices for cultivation of major fruit crops like, mango, banana, citrus, grape, papaya, sapota, guava, pomegranate, minor fruit crops like pine apple, ber, fig, anola, jamun, tamarind, jackfruit, kokum, karonda, annona, strawberry, cashewnut, coconut, arecanut, coffee, betelvine, etc. Industrial value of plantation crops (Give brief cultivation information in tabular form for minor crops).

LESSON PLAN

Lecture No.	Topic Details	Weightage
1.	Classification of fruit crops on Horticultural basis.	5
2.	Importance, present status and future scope for fruit growing in Maharashtra and India. . Area and production, export, import scenario of fruit crops and plantation crops in Maharashtra and India.	5
3.	Nutritive value of fruits, importance of selection of site, fencing, planting systems and establishment of orchard.	3
4.	High density planting, Wind breaks and shelter belts in fruit production.	5
5.	Propagation methods and use of rootstocks, methods of training and pruning.	5
6.	Special Horticultural practices like bahar treatment, ringing, girdling, bending, notching. Nutrient management, water management, weed control, mulching, intercropping.	5
7.	Use of Plant growth regulators in fruit production, physiological disorders in fruit crops.	5

* Package of practices for cultivation of major fruit crops		
8	Mango	5
9	Banana	5
10	Citrus	5
11	Grape	5
12	Papaya, Sapota	5
13	Guava, Pomegranate,	5
14&15	Minor fruit crops like pine apple, ber, fig, anola, jamun, tamarind, jackfruit, kokum, karonda, annona, strawberry, cashewnut, coconut, arecanut, coffee, betelvine, etc. Industrial value of plantation crops (Give brief cultivation information in tabular form for minor crops).	10

PRACTICALS

Study of garden tools and implements. Study of propagation media, containers, potting mixture, potting, repotting and transplanting. Nursery practices for raising seedlings. Identification of fruit and plantation crops. Plant propagation by seed, cutting, layering, budding and grafting. Practices in planning (layout) and planting systems of fruit crops. Training and pruning, manures and fertilizers application, irrigation methods. Special horticultural practices like bahar treatment, ringing, girdling, bending, notching etc. Preparation and application of growth regulators. Preparation and application of Bordeaux solution and paste. Identification of important pests and diseases of fruit crops and their control. Harvesting, post harvest treatments, grading and storage. Visit to commercial orchards. Working out the economics of important fruit crops.

Practical No.	**Topic Details**	**Weightage**
1.	Identification of fruit and plantation crops.	
2.	Study of garden tools and implements. Study of propagation media, containers, potting mixture, potting, repotting and transplanting.	
3.	Plant propagation by seed, cutting, layering, budding and grafting.	
4.	Practices in planning (layout) and planting systems of fruit crops.	
5.	Training and pruning in fruit crops	
6.	Manures and fertilizers application, irrigation methods.	
7.	Special horticultural practices like bahar treatment, ringing, girdling, bending, notching	

8.	Preparation and application of growth regulators	
9.	Preparation and application of Bordeaux solution and paste.	
10.	Identification of important pests of fruit crops and their control.	
11.	Identification of important diseases of fruit crops and their control.	
12.	Harvesting, post harvest treatments, grading and storage.	
13.	Visit to commercial orchards.	
14.	Working out the economics of important fruit crops.	

REFERENCE BOOKS

1. Hayes, W. B. Fruit Growing in India. Kitab Publishing Co., Allahabad.
2. Shanmugavelu, K. G. Production Technology of Fruit Crops, SBA Publishers, Kolkatta.
3. Singh, Ranjeet. 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-700016.
6. Baker, H. Fruits. Mitchell Meagrely Publications, London.
7. Singh, A. Fruit Production and Technology. Kalyani Publishers, New Delhi.
8. Yadav, P. K. Fruit Production Technology. International Book Distributing Co., Division, Lucknow, Inida.
9. Sharma, R. R. Fruit Production Problems and Solutions. International Book Distributing Co., Division, Lucknow, India.
10. Kumar, P. Management of Horticultural Crops. (Hort Sciene Series Vol. 11, New India Publishing Agency, NIPA).

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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.

LESSON PLAN

Lectures	Topics	Weightage

1	History of plant tissue culture and plant genetic engineering, Scope and importance in crop improvement	8
2,3	Totipotency and Morphogenesis Nutritional requirements of plant tissue culture Calculation for molar solution, normal solution, percent solution Different types of medium Role of hormones and growth regulators	8
4	Techniqyes of *in vitro* culture Types of cultures Principles of different cultures Different applications of culture	8
5	Test tube fertilization Limitations if test tube fertilization Applications of test tube fertilization Procedure of test tube fertilization Factors affecting on test tube fertilization	8
6,7	Endosperm culture Mature and immature endosperm culture Procedure of endosperm culture Applications of endosperm culture Somaclonal variation applications of Somaclonal variation Acheivements of Somaclonal variation Types of Somaclonal variation Procedure of Somaclonal variation	8

Lectures	Topics	Weightage

8	Somatic embyogenesis Somatic hybrids Synthetic seed production Application of synthetic seed	8
9	Protoplast culture Isolation (Enzymatic and mechanical method) Protoplast manipulation and fusion Production of cybrids Appliations of protoplast culture	8
10,11	Concept of genetic engineering Restriction enzymes and their uses Concept of vectors and their types for gene transfer Gene cloning Direct method of gene transfer Indirect method of gene transfer Transgenic plants and their applications	8
12	Different types of blotting techniques Southern Northern Western	5
13,14	DNA fingerprinting DNA based markers: PCR principles and concept RFLP, RAPD, SSR, DNA probesand their applications	5
15,16	Mappimg of QTL and future prospects Concepts of quantitative and qualitative trait loci Concept of GXE interaction Different types of mapping population	5

	Advantages and disadvantages of different mapping population MAS and its application in crop improvements	

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.

Practical No.	**Practical**
1	Plant tissue culture laboratory specifications and organization of equipments and their use
2	Different Sterilization techniques and aseptic manipulations
3	Preparation of tissue culture media and their composition
4	Preparation of explants (Banana/ sugarcane) establishment and maintenance of callus cultures from different explants, sub culture of callus
5	Regulation of morphogenesis from different explants, roots, stem, leaf, bud
6	Micopropagation with shoot apex culture in different plants(Banana/ sugarcane)
7	Meristem culture
8	Anther and pollen culture
9	Embryo and endosperm culture
10	Somatic embryogenesis and artificial seed production
11	Isolation and culturing of protoplast
12	Isolation genomic DNA
13	Gene transfer method: direct method
14	Gene transfer method: indirect method
15	Gel electrophoresis technique
16	Confirmation of genetic transformation.

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. Elsvier Science Publishers-B.V., Amsterdam
5. Razdan, M. K. An Introduction to Plant Tissue Culture. Oxford and IBN Publishing Co. Pvt. Ltd., New Delhi.
6. Natesh, S., V.L. Chopra, and S. Ramachandran. Biotechnology in Agriculture. Oxford and IBN Publishing Co. Pvt. Ltd., New Delhi

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Course No. : COMP-111
Title : Introduction to Computer Applications
Credits : 2=1+1

THEORY

Introduction, history, concepts of hardware, software, machine language, high level language, DOS commands, working with different Windows Operating Systems Utilities: Note pad, Word pad, Paint Brush, Control Panel, Windows explorer, etc

Working with MS WORD: Creating, saving, importing, exporting and inserting files, Formatting pages, paragraphs and sections, indents, creating lists and numbering headings, styles, fonts and font sizes. Editing texts, position and viewing texts, using tabs and tables, Tabs and dot leaders, finding and replacing texts, Inserting page breaks, page numbers, bookmarks, symbols and date, header, footer, footnotes, annotations, endnotes, working with text boxes and frames, working with columns, pictures, charts and graphs, forms, tools, working with objects – word arts, equations and worksheets, automating with macros, printing and working with master documents.

Working with MS EXCEL: Creating worksheets and workbooks, opening and saving workbooks and exiting excel, formatting numbers and texts, protecting cells, producing charts, printing operations, linking workbooks, macros, database, using tables, using files with other programs, creating graphs, performing statistical analysis of data.

Working with MS ACCESS: Understanding databases, creating table, creating queries, forms, finding information in a database, creating reports, adding graphs to reports, creating mailing labels, automating work with macros.

Working with MS Power Point: Working with built in wizards, working with texts and lists, colors and transitions, adding headers and footers, drawing tools, animation and sound, importing objects from other applications, automating presentations, hyperlinks to external resources, printing presentation, modifying and integrating presentation, distributing presentation with power point viewer.

Internet and E-mail: Internet applications, access, e-mail, internet services, web pages search tools, web utilities, Internets and Extranets.

Working with different statistical analysis software.

LESSON PLAN

Lectures	Topics	Weightage
1	**Introduction:** history, concepts of hardware, software, machine language, high level language, DOS commands.	8
2	**Working with different Windows Operating Systems Utilities:** Note pad, Word pad, Paint Brush, Control Panel, Windows explorer, etc..	8
3, 4, 5, 6	**Working with MS WORD:** Creating, saving, importing, exporting and inserting files, Formatting pages, paragraphs and sections, indents, creating lists and numbering headings, styles, fonts and font sizes. Editing texts, position and viewing texts, using tabs and tables, Tabs and dot leaders, finding and replacing texts, Inserting page breaks, page numbers, bookmarks, symbols and date, header, footer, footnotes, annotations, endnotes, working with text boxes and frames, working with columns, pictures, charts and graphs, forms, tools, working with objects – word arts, equations and worksheets, automating with macros, printing and working with master documents.	20
7,8	**Working with MS EXCEL:** Creating worksheets and workbooks, opening and saving workbooks and exiting excel, formatting numbers and texts, protecting cells, producing charts, printing operations, linking workbooks, macros, database, using tables, using files with other programs, creating graphs, performing statistical analysis of data.	10
9,10	**Working with MS ACCESS:** Understanding databases, creating table, creating queries, forms, finding information in a database, creating reports, adding graphs to reports, creating mailing labels, automating work with macros.	10
11, 12, 13	**Working with MS Power Point:** Working with built in wizards, working with texts and lists, colors and transitions, adding headers and footers, drawing tools, animation and sound, importing objects from other applications, automating presentations, hyperlinks to external resources, printing presentation, modifying and integrating presentation, distributing presentation with power point viewer.	10
14, 15	**Internet and E-mail:** Internet applications, access, e-mail, internet services, web pages search tools, web utilities, Internets and Extranets.	8
16	Working with different statistical analysis software.	5

PRACTICALS

Use of MS EXCELL for analysis of data. Preparation of reports using MS WORD, Preparation of Power Point Slides with animation effect. Use of internet, E-mail, HTML. Use of MS ACCESS. Graphs presentations, etc. Working with different statistical analysis software.

Practical No.	**Practical**
Sr. No.	**Practical**
1	Use of MS EXCELL for analysis of data.

2	Preparation of reports using MS WORD.
3	Preparation of Power Point Slides with animation effect.
4	Use of internet, E-mail, HTML.
5	Use of MS ACCESS.
6	Graphs presentations, etc.
7	Working with different statistical analysis software.

REFERENCE BOOKS

1. Rssel A. Stultz. Learn Microsoft office – 97.
2. Mansfield R (1993), Complete guide to window word and excel, BPB, Publication, New Delhi.
3. Manuals of concerned software.

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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.

LESSON PLAN

Lectures	Topics	Weightage
1	**Agricultural Economics**: Meaning, definition	5
2,3	**Basic concepts:** Goods, Services, Utility, Value, Price, Wealth, Welfare	5
4,5	**Wants**: Meaning, characteristics, classification of wants, importance	5
6,7	Scope and importance of agriculture in National economy	8

8,9,10,11	**Land:** Meaning, importance, land use classification, land ownership and distribution of land, management of land	10
11,12,13	**Agricultural Labour**: Meaning, definition, types of labour, categorisation of labour wages, Minimum Wages Act, efficiency of labour	10
14,15	**Agricultural Capital:** Meaning, importance, capital formation in Indian agriculture and present trends	10
16,17,18	**Farm Mechanization:** Types, scope for farm mechanization, effects of mechanization	10
19,20,21,22	**Agricultural technology** and its effects on Indian agriculture, green revolution, white revolution etc. Growth in agricultural output in India.	10
23	**Natural Resources** - meaning and importance of natural resources.	6
24,25	**Types of natural resou**rces- a)Renewable - Meaning and importance b)Non-renewable natural resources – Meaning and importance	6
26	Forest Development Programme in India	5
27,28,29	Surface water and ground water-their potential and utilization in Maharashtra	5
30,31,32	Importance of fishery types of fishery fishery development policies in India	5

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.

PracticaNo.	**Practical**
1	Study of land use classification.
2	Study of Crop patterns.
3	Study of distribution of ownership and operational land.
4	Study of trends in wages.

5	Study of area, production and productivity of major crops in the State.
6	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. Mamoria, 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.

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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.

LESSON PLAN

Lectures	Topics	Weightage
1,2	Place of agriculture in National economy and comparison with other countries.	8
3,4	Special characteristics of agriculture in Indian economy.	10
5, 6, 7, 8, 9, 10	Pattern of agriculture holdings, fragmentation, sub-division and consolidation of land holdings.	15
11,12,13	Agricultural productivity: Trends, causes and consequences of low productivity in India.	15
14, 15, 16, 17	Input utilization, fertilizers, pesticides etc.	10
18, 19, 20, 21	Green revolution: New strategy in development of Indian agriculture, High Yielding Varieties (HYV) programme, irrigation development and farm mechanization.	15
22, 23, 24	Five Year Plans and place of agriculture in National planning	8

25, 26, 27	Problems of food security.	10
28, 29	Demographic profile of Indian population.	10
30, 31	Review of development programmes: Programmes for weaker sections including Tribal.	8
32	Integrated Rural Development, nature and dimensions.	10

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.

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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.

LESSON PLAN

Lectures	Topics	Weightage
1, 2	**Agri-business:** Meaning, definition, history and scope of agri-business (Input, Farm Product Sectors).	5
3	Importance of agri-business in the Indian economy.	5
4	Changing dimension of agricultural business.	3
5, 6	Agri-business Management-distinctive features, nature and components, importance of good management, definition of management and management functions,	5
7	Five Years Plans and agri-business, characteristics of plans	5

8,9	Organization and operation of farm business, tools of farm business organization and operation, steps in farm business organization	5
10	Evaluation of available resources, appraisal and goals of farm business and approach to reorganization of the farm business.	5
11	Farm adjustment programme under uncertainty, job of proficient farm planner, farm accountancy.	5
12	Constraints in agri-business management infrastructure, technological, social and cultural.	5
13	Analysis of farm records; Farm inventories.	10
14, 15, 16	**Financial Management of Agri-business:** Importance of Financial Statement, Balance sheet, Income account/ Profit and Loss Statement, Efficiency measures, Partial and Complete budgeting.	10

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.

Sr. No.	Practical
1	Preparation of alternate farm plans.
2	Preparation of farm records.
3	Estimation of inventory, turnover and levels of inventory.
4	Preparation of balance sheet and income statement.
5	Farm efficiency measures and evaluation of available resources.
6	Reorganization of farm business and farm adjustment programme under uncertainty.
7	Farm accountancy.
8	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.

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Course No. : MATH-111
Title : Mathematics
Credit : 2=1+1

THEORY

Quadratic equation: Definition of quadratic equation, Roots of quadratic equation, Nature of roots, Sum and product of roots, Formation of quadratic equation, Examples based on above topics.

Logarithm: Definition, Laws of logarithm and Change of base theorem (without proofs) Examples based on laws.

Determinants: Definition of determinant (Statements), Minors of the determinant, Expansion of determinant, Properties of determinant (Statement only) Examples based on expansion of determinant.

Point, Distance between two points, section formulae: Co-ordinate axes, origin, Quadrants, Distance between two points, section formulae for internal division (without proof). Examples based on distance and section formulae.

Locus of a point, different forms of straight lines: Definition of locus, equation to a curve, equation to axes and straight lines parallel to axes, statements of equations of straight line in slope intercept form, double intercept form and two points form. General equation of straight line, Formula for angle between two straight lines (without proof), Conditions for two straight lines to be parallel and to be perpendicular.

Circle : Definition of circle, Statements of standard form, centre-radius form, General form and the most general form of equation of circle (without proof) Examples based on these forms.

Trigonometry : Fundamentals of Trigonometry, Definition of angle of elevation and angle of depression with examples.

Mensuration : Illustration of ordinates of curve and common distance between ordinates, Statement of Simpson's rule and its application for measuring areas of irregular field. Examples based on Simpson's rule.

Function, Limit : Definition of function, Domain and rage of function, independent and dependent variables Illustration of different types of functions with examples only such as Algebraic (rational, polynomial and constant), Non algebraic function (Logarithmic, Trigonometric, Inverse trigonometric and exponential).

Definition of limits, theorems and standard limits (only statements)

Examples on evaluation of finite limits of polynomial, rational, trigonometric functions.

Differential calculus, **Theorems of differentiation :** Definition of differentiation, Differential coefficient, Theorems of differentiations, Composite function and Chain Rule (without proofs, List of standard formulae for power, trigonometric, logarithmic and exponential functions. Examples based on rules

Integral calculus, Concept of indefinite Integral: Definition of Integral of a function, Integrand and process of Integration, study of integral calculus, constant of Integration, table of elementary integrals,

Theorems on integration (without proof), Examples on integration by decomposition method only, definition of definite integral and simple examples on definite integral.

LESSON PLAN

PRACTICALS

Practicals to be prepared by concerned course teacher.

REFERENCE BOOKS

1. Higher Algebra - by Hall and Knight
2. Plane Trigonometry – Part I - by S.L.Loney
3. Coordinate Geometry – Part I - by S.L.Loney
4. Mensuration – I - by Pierpoint
5. Differential Calculus - Shanti Narayan
6. Integral Calculus - Shanti Narayan

To cover fundamental topics on trigonometry, differential and integral calculus any suitable book for XI and XII standard may be referred

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Course No. : BIO-111
Title : Biology
Credit : 2 = 2 + 0

THEORY

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.

LESSON PLAN

Lectures	Topics	Weightage
1	Nature and scope of biology.	6
2,3	Cell division.	8
4	Classification of plants.	6
5	Morphology of flowering plants.	6
6	Genetic basis of inheritance.	6
7	Main features of life.	6

8,9	Structure and function of fundamental tissues	8
10	Chromosomal basis of inheritance.	6
11,12	Nutrition in man. Respiration in man.	8
13,14	Biology in human welfare	6
15,16,17	Physiology of plants. Plant water relations.	8
18,19,20	Photosynthesis. Respiration.	6
21,22	Reproduction in angiosperms.	6
23,24,25	Morphology of animals. Circulation in animals	8
26,27,28	Osmoregulation and excretion in animals.	8
29,30	Hormonal co-ordination in human.	6
31,32	Types of reproduction. Modes of asexual reproduction.	8

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.

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Course No. : LANG-111
Title : Comprehensive and Communication Skills in English
Credit : 2=1+1

THEORY

Reading Comprehension: To locate specific information for meaning of words, phrases sand sentences for understanding logical relationship between statements. Taking and making notes.

Technical Reports: Structure, Language. Press notes/ articles Precise, summary, abstracts. Paragraph writing. Job application & CV writing. Notice, agenda and minutes Personal and professional correspondence. Stress and Intonation, Group discussion. Interview (Interviewee & interviewer). Listening comprehension, Power point presentation.

LESSON PLAN

Lectures	Topics	Weightage
1, 2,	Reading Comprehension: To locate specific information for meaning of words, phrases sand sentences for understanding logical relationship	10

3, 4	between statements. Taking and making notes.	
5, 6	Technical Reports: Structure, Language. Press notes/ articles Precise, summary, abstracts.	8
7	Paragraph writing.	5
8, 9	Job application & CV writing.	5
10, 11	Notice, agenda and minutes.	5
12, 13	Personal and professional correspondence.	5
14, 15	Stress and Intonation, Group discussion. Interview (Interviewee & interviewer).	5
16	Listening comprehension, Power point presentation.	5

PRACTICALS

Reading Comprehension: Location of specific information, meaning of words, phrases. Sample analysis, writing analysis. Taking and making notes, case studies/Sample analysis, technical reports, press notes, news articles: Sample analysis and case studies, job application and CV writing, sample analysis, notice, agenda minutes writing: sample analysis and case studies, personal and professional correspondence. Sample analysis and case studies.

Stress and Intonation- Practice and Drill. Group discussion, mock interviews.

Listening Skills: Practice of listening to talks, speeches & lectures.

Power point presentation- Practice and sample analysis.

Following syllabus will not be included in the examination. But, it is decided in the meeting to cover following topics in the classroom.

Word order, Subject- Verb Agreement, Preposition, Tenses, Voices, Phrasal verbs etc. Technical reports, Handling media, Business presentation, Referencing, E-mail, FAX etc.

Sr. No.	Practical
1	***Reading Comprehension***: Location of specific information, meaning of words, phrases.
2	Taking and making notes, case studies/Sample analysis, technical reports, press notes, news articles: Sample analysis and case studies.
3	Sample analysis, writing analysis., job application and CV writing, sample analysis, notice, agenda minutes writing: sample analysis and case studies.
4	personal and professional correspondence. Sample analysis and case studies.
5	***Stress and Intonation***- Practice and Drill. Group discussion, mock interviews.
6	***Listening Skills:*** Practice of listening to talks, speeches & lectures.
7	***Power point presentation-*** Practice and sample analysis.

*	**Following syllabus will not be included in the examination. But, it is decided in the meeting to cover following topics in the classroom.**
8	***Word order, Subject***- Verb Agreement, Preposition, Tenses, Voices, Phrasal verbs etc. Technical reports, Handling media, Business presentation, Referencing, E-mail, FAX etc.

REFERENCE BOOKS

English for practical purposes by Z. N. Patil, et al: Macmillan

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SEMESTER – II

Course No. : AGRO-122
Title : Farming Systems and Sustainable Agriculture
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 alellopathy 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.

LESSON PLAN

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 Lither 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.

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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.

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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. **Fertilizer**s- 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.

LESSON PLAN

Lectures	Topics	Weightage
1	Soil as a medium for plant growth, soil fertility and productivity, methods of soil evaluation.	5
2	Essential plant nutrients, macro and micronutrients and its role.	5

	Mechanism of nutrient uptake.	
3	**Problematic soils**: Saline, saline-sodic, sodic, acid soils and calcareous soils and their reclamation.	5
4, 5, 6, 7, 8, 9	**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.	5
10, 11, 12, 13	**Fertilizer**s- NPK fertilizers, classification, properties, reaction in soils. Mixed, complex and compound fertilizers. Fertigation, slow release fertilizers, bio-fertilizers.	5
14	**Fertilizer management:** Use efficiency, handling and storage.	5
15, 16	**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.	5

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.

Sr. No.	Practical
1	Determination of soil organic carbon.
2	Determination of calcium carbonate.
3	Determination of available soil NPK.
4	Study of DTPA extractable micronutrients and fertilizer recommendation.
5	Study of Plant analysis, plant tissue testing.
6	**Analysis of organic manures:** Organic carbon.
7	Analysis of total NPK.
8	Analysis of DTPA extractable micro-nutrient.
9	Analysis of C: N ratio.
10	**Fertilizer analysis**: Urea and ammonium sulphate.

11	Analysis of potassium nitrate and murate of potash.
12	Analysis of super phosphate and rock phosphate.
13	Analysis of 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.

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Course No. : ENGG-121
Title : Farm Structures 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 CO_2 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.

LESSON PLAN

Lectures	Topics	Weightage
1,2	Introduction, location, size and management of farmstead	6
3	Septic tank, soak pit, its location, capacity, construction and maintenance	6
4	Farm fencing and their types	6
5	Animal shelter and their types	6
6	Poultry housing and their types	5
7	Building materials	4
8	Farm silos and their types	4
9,10	History, development and scope of green house technology,	8

	green house planning, layout and its construction	
11,12	Effect of temperature, pH and CO_2 with reference to micro-climate on green house crops	6
13	Role of light, ventilation, cooling, utility of green house for different crop production	5
14,15	Covering material, irrigation, fertigation and humidification inside green house. Pests and disease control in green house	8
16	Post harvest technology	5

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.

Sr. No.	**Practical**
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.
4. RadhaManohar, C. K and Igathinathane B. S. Greenhouse – Technology & Management. Publications, Hyderabad.

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Course No. : ENT-121
Title : Integrated Pest Management
Credit : 2=1+1

THEORY

Importance of pest control, status of chemical/ bio-pesticides in India. Chemical pesticides and hazards, definition of IPM, principles of of IPM and components. Parasites and predators, IPM strategies for paddy, pigeon pea, chickpea, cotton, sugarcane, grape, pomegranate, mango, citrus, okra, brinjal, tomato, potato, cabbage, cauliflower etc. Food safety standards and pesticide residue management, APEDA and its role in agricultural export.

LESSON PLAN

Lectures	Topics	Weightage
1	Concepts and importance of pest control	8
2	status of chemical/ bio-pesticides in India	5
3	Chemical pesticides and hazards	5
4, 5	Definition of IPM, principles of of IPM and components	10
6	Parasites and predators	8
7, 8, 9, 10, 11, 12	IPM strategies for paddy, pigeon pea, chickpea, cotton, sugarcane, grape, pomegranate, mango, citrus, okra, brinjal, tomato, potato, cabbage, cauliflower etc	20
13, 14	Food safety standards and pesticide residue management	5
15, 16	APEDA and its role in agricultural export	5

PRACTICALS

Studies of commonly available chemical and bio-pesticides in market, production of bio-pesticides and bio agents, visit to bio pesticide manufactures.

Practical No.	Topics
1, 2, 3, 4	Studies of commonly available chemical and bio-pesticides in market

5, 6, 7, 8, 9, 10, 11	Production of bio-pesticides and bio agents
12, 13, 14	Visit to bio pesticide manufactures

REFERENCE BOOKS

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

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Course No. : EXTN-121
Title : Entrepreneurship and Personality Development
Credit : 2=2+0

THEORY

Entrepreneur : Evolution of the concept of Entrepreneur, characteristics of an Entrepreneur, Types of Entrepreneur. Differentiate in the concept of entrepreneur and manager. **Entrepreneurship:** Concept, Growth of Entrepreneurship in India, Role of Entrepreneurship in Economic development. Factors affecting **Entrepreneurial Growth:** Economic factors, Non-Economic factors, Government actions. **Promotion of a venture:** Opportunities analysis, external environmental analysis, economic, social and technological, competitive factors, legal requirements for promotion of a venture. **Entrepreneurial Behaviour:** Innovation and Entrepreneur, Entrepreneurial Behaviour and psycho-theories, social responsibility. **Entrepreneurial motivation:** Definitions, motivation Theories, motivating factors, Achievement motivation. **Entrepreneurial mobility:** Factors influencing mobility, occupational mobility, locational mobility. **Small Enterprises:** Meaning, definition, characteristics, Relationship between small and large units. Role of small Enterprises in economic development, opportunities for an entrepreneurial career. Government schemes and incentives for promotion of entrepreneurship. Government policy on small and medium enterprises. Management: meaning, characteristics, scope, functions, management process, Difference between management and Administration. **Working capital management:** Meaning, significance, factors determining requirement of working capital, sources and management of working capital. **Human Resource Management:** Meaning, selection, Training and development, Remuneration and Benefits, job requirements. **Personality:** Meaning, definition, popular and scientific view of personality.**Factor influencing personality:** Constitutional determinants, Group membership, role, situation. **Socialization:** through role and status, social roles and personality. **Role Behaviour:** Ascribed and Achieved Status, role personality and true personality. **Formation of personality:** Physical, heredity, culture and unique experiences.

LESSON PLAN

Lectures	Topics	Weightage
1, 2	**Entrepreneur :** Evolution of the concept of Entrepreneur, characteristics of an Entrepreneur, Types of Entrepreneur. Differentiate in the concept of entrepreneur and manager.	10
3, 4	**Entrepreneurship:** Concept, Growth of Entrepreneurship in India, Role of Entrepreneurship in Economic development. Factors affecting **Entrepreneurial Growth:** Economic factors, Non-Economic factors, Government actions.	10
5, 6	. **Promotion of a venture:** Opportunities analysis, external environmental	10

	analysis, economic, social and technological, competitive factors, legal requirements for promotion of a venture.	
7, 8, 9	**Entrepreneurial Behaviour:** Innovation and Entrepreneur, Entrepreneurial Behaviour and psycho-theories, social responsibility. **Entrepreneurial motivation:** Definitions, motivation Theories, motivating factors, Achievement motivation.	12
10, 11	**Entrepreneurial mobility:** Factors influencing mobility, occupational mobility, locational	6
12, 13, 14, 15, 16, 17, 18, 19	**Small Enterprises:** Meaning, definition, characteristics, Relationship between small and large units. Role of small Enterprises in economic development, opportunities for an entrepreneurial career. Government schemes and incentives for promotion of entrepreneurship. Government policy on small and medium enterprises. Management: meaning, characteristics, scope, functions, management process, Difference between management and Administration.	20
20, 21	**Working capital management:** Meaning, significance, factors determining requirement of working capital, sources and management of working capital.	10
22, 23, 24, 25	. **Human Resource Management:** Meaning, selection, Training and development, Remuneration and Benefits, job requirements	10
26, 27, 28	. **Personality:** Meaning, definition, popular and scientific view of personality.**Factor influencing personality:** Constitutional determinants, Group membership, role, situation.	8
29, 30, 31	**Socialization:** through role and status, social roles and personality. **Role Behaviour:** Ascribed and Achieved Status, role personality and true personality.	8
32	**Formation of personality:** Physical, heredity, culture and unique experiences.	6

REFERENCE BOOKS

1. Ellis, R.S., Educational Psychology. D.N. Van No Strand Co. Inc. New York.
2. Entrepreneurship Development Institute of India (1987), Developing New Entrepreneurs, EDIT, Ahmedabad, NISIET. Library : 338-93/EDI/87/25104.
3. Khanka S.S. (2001), Entrepreneurial Development chand and company Ltd, 7361, Ramnagar, New Delhi – 110055.
4. Vasant Desai (2004), Dynamics of Entrepreneurial Development and Management.
5. Morgan, C.T. Klng, R.a. Robinson, N.M. (1979). Introduction to psychology-Tata M.Graw Hill Publishing Co., New Delhi.
6. Agarwal R.C. Fundamentals of Entrepreneurship.
7. Hans Raj Bhatia (2003). A Text book Educational Psychology. New Delhi.

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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 terms and objectives. **Basic relationships:** Factor-Product relationship, Factor- Factor relationship and Product-Product relationship, cost concepts used in farm management studies.

LESSON PLAN

Lectures	Topics	Weightage
1	**Farm Management:** Meaning and definition, objectives and scope.	5
2	**Basic economic Principles of Farm Management** 2.1Law of Diminishing Returns 2.2Principle of Factor Substitution 2.3Principle of Product Substitution 2.4Principle of Equi-Marginal Returns 2.5Opportunity Cost Principle 2.6Principle of Comparative Advantage	10
3	**Types of farming:-** 3.1 Specialized Farming 3.2 Diversified Farming 3.3 Mixed Farming 3.4 Dry Farming 3.5 Ranching	10

	Systems of Farming:- 4.1 Peasant Farming 4.2 Co-operative Farming: a) Co-operative Better farming Society, b) Co-operative Joint Farming system, c) Co-operative Tenant Farming Society, d) Co-operative Collective Farming Society. 4.3 Capitalistic Farming 4.4 Collective Farming 4.5 State Farming	
4	Cost and returns	8
5	**Farm Records**: Objectives and importance.	10
6	Types of Farm Records:- 7.1 Records maintained on an average farm 7.2 Records maintained on the corporate farms and the state farms 7.3 Records maintained on commercial dairy farms	10
7,8	**Farm inventory**:- Concepts and terms Methods of Valuation: 7.1 Net Selling Price 7.2 Cost Less Depreciation 7.3 Market Price 7.4 Cost 7.5 Replacement Cost Less Depreciation 7.6 Income Capitalization	8
9	**Depreciation.** Methods of computation:- 1. Straight Line Method 2. Diminishing Balance Method	8

	3. Sum of the Years Digits Method 4. Annual Revaluation Method	
10	**Farm Efficiency Measures:-** 9.1Physical Efficiency Measures: 1.Land 2.Labour 9.2 Financial Efficiency Measures: 1. Aggregate Measures 2. Ratio Measures	10
11,12	**A) Farm Planning :-** 1.Necessity of farm planning 2. Characteristics of good farm plan 3. Types of Farm Plans : (a) Partial (b) Complete 4. Limitations of farm planning **B) Farm Budgeting.** 1. Types of Farm Budget: (a) Farm Enterprise (b) Partial Budgeting 2. Steps in whole farm planning and budgeting:- (a) Statement of objective (b) Diagnosis of the existing organization (c) Assessment of resource endowment on the farm (d) Identification of enterprises to be included (e) Preparations of enterprise budgets (f) Identification of risks, and (g) Preparation of a plan	15
13	**Risk and uncertainty:-** a) Sources of Risk b) Measures to manage farm risk	8

14	**Production Economics:** Meaning, definition, nature and scope of agricultural production economics, Basic concepts terms and objectives.	8
15	**Basic relationships in Farm Business Management** 13.1 Factor-Product relationship. 13.2 Factor- Factor relationship. 13.3 Product-Product relationship.	8
16	Cost concepts used in farm management studies.	5

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.

Practical No.	**Practical**	**Weightage**

Practical No.	**Topics**
1.	Study of different principles of farm management. 1.1 Law of Diminishing Returns 1.2 Principle of Factor Substitution 1.3 Principle of Product Substitution 1.4 Principle of Equi-Marginal Returns 1.5 Opportunity Cost Principle 1.6 Principle of Comparative Advantage
2.	Study of relationship between total, average and marginal costs.
3.	Stages of production and relationship between average, marginal and total product.
4.	Working out optimum level of input and optimum product combination.
5.	Study of farm planning and budgeting.
6.	Study of different farm records. 6.1 Records maintained on an average farm 6.2 Records maintained on the corporate farms and the state farms

	6.3 Records maintained on commercial dairy farms

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.

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Course No. : ECON- 124
Title : Money, Banking and International Trade
Credit : 2=1+1

THEORY

Money: Meaning, importance, evolution, qualities of good money, coins and coinage, kinds of money, functions 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.

International Trade: Meaning, definition, scope, pre-export behaviour-factors to be considered, methods of entering foreign markets, importance of International markets, economic reasons for export. **International marketing:** Practices and problems, policies and economic forces and political considerations. **GATT:** Basic principles and emergence of WTO. Trade codes, application of WTO. **Import-Export Policies:** Present Agril. Export Policy of the Govt. under liberalized economic environment. IPR, TRIPS, TRIM, AoA etc.

LESSON PLAN

Lectures	Topics	Weightage
1,2,3,4	**Money:** **1.** Meaning and importance. **2.** Evolution of money. **3.** Qualities of good money. **4.** Coins and coinage. **5.** Kinds of money. **6.** Functions of money. **7.** Demand for and supply of money. **8.** Monetary standards- **(a)** Bimetalism **(b)** Monometalism	15

	(c) Paper standard.	
5,6,7,8	**Banking:** 1. Types of banks. 2. Role of banks in economic development. 3. Functions and achievements of commercial banks. 4. Central bank: (a) Banking principles of central bank. (b) Functions of central bank. (c) Measures of credit control. (d) Monetary policy. 5. Nationalization of banks and its impacts. 6. Role of credit institutions in development of agriculture.	15
9,10,11,12	**International Trade:** **1.** Meaning and definition of International trade. **2.** Scope for International Trade. **3.** Pre-export behaviour-factors to be considered. **4.** Methods of entering foreign markets. **5.** Importance of International markets. **6.** Economic reasons for export.	15
13,14,15,16.	**International marketing:** **1.** Practices and problems. **2.** Policies and economic forces and political considerations. **3. GATT:** Basic principles and emergence of WTO. **4.** Trade codes, application of WTO. **5. Import-Export Policies:** Present Agril. Export Policy of the Govt. under liberalized economic environment. **6.** IPR. **7.** TRIPS. **8.** TRIM. **9.** AoA etc.	15

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. A study of major agril. export policies. Present Agril. Export Policy.

Sr. No.	Practical
1	Study of credit instruments i.e. cheque, promissory notes, hundies etc.
2	Nature and types of securities.
3	Organization and working of RBI.

4	Organization and working of Co-operative banks.
5	Organization and working of Commercial banks.
6	Various schemes meant for weaker sections implemented by banks.
7	A study of major agril. export policies.
8	Present Agril. Export Policy.

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.
5. Acharya S.S. and N.L. Agarwal. Agricultural Marketing in India. Oxford and IBH Publishing Company Pvt. Ltd., 66, Janpath, New Delhi 110001
6. Varma M.M. and R.K. Agarwal. World Trade Management. King Books
   Educational Publishers, 1684 Nal Sarak, Delhi-110006
7. GATT: Agreement: Results of Uruguay Round, MVIRDC, World Trade Centre, Mumbai. King Books, Educational Publishers, 1684, Nal Sarak, Delhi-11006.

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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. **Problems of Agril. Marketing:** Defects in traditional agril. marketing system and suggestions for improvement. Present status and problems in various marketing functions. **Standardization:** Standards and standardization, aims of standardization, significance of standardization, demerits of standardization. Basis of standards. **Grading:** A marketing function. Importance of grading in agriculture, grading in India. **Channels 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. **Hedging:** Meaning, chief features of hedging, kinds, purpose, benefits and limitations of Hedging. **Future Trading:** Characteristics of future trading, organized trade in futures.

LESSON PLAN

Lectures	Topics	Weightage
1	**Agricultural Marketing:** Definition and concepts, scope and subject matter.	5
2,3	Market and marketing: Meaning, definition, components of a market, importance of agricultural marketing, classification, types of markets.	5
4	**Problems of Agril. Marketing:** Defects in traditional agril. marketing system and suggestions for improvement. Present status and problems in various marketing functions.	5
5	**Standardization:** Standards and standardization, aims of standardization, significance of standardization, demerits of standardization. Basis of standards.	5
6	**Grading:** A marketing function. Importance of grading in agriculture, grading in India.	5
7	**Channels of Marketing:** Meaning, definition, channels of different products, market functionaries and their role.	5
8,9	**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.	8
10	**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.	8
11,12	Functions of price mechanism, interrelationship between prices of inputs and output. Types and reasons for price movements and their effect on agriculture price stabilization and price support policies.	5
13	Nature and supply of agricultural products, marketable and marketed surplus.	5
14	**Warehousing:** State and Central Warehousing Corporations, objectives, functions, advantages, speculation, future trading and hedging.	8
15	**Hedging:** Meaning, chief features of hedging, kinds, purpose, benefits and limitations of Hedging..	6
16	**Future Trading:** Characteristics of future trading, organized trade in futures	6

PRACTICALS

Studies on estimation of marketing 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. Exercises on grade standards of various agril. Products. Exercises on practice of hedging and future trading operated in the market. A study of cases of hedging and future trading in farm products.

Sr. No.	Practical
1	Studies on estimation of marketing cost, price spread, market margins.
2	Study on standardization, grading, storage, warehousing.
3	Marketing of foodgrains, fruits, vegetable, milk and eggs.
4	Price fluctuations and relationship between arrivals and prices of commodities.
5	Study of regulated market and co-operative marketing.
6	Study of grade standards of various Agril. Products.
7	Study of practice of hedging and future trading operated in the market
8	A study of cases of hedging and future trading in 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 - 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.

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Course No. : ABM-122
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 e.g. NOGA (Nagpur Orange Growers Association), institutional arrangement, steps in setting up 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.

LESSON PLAN

Lectures	Topics	Weightage
1,2	**Agro-based Industries:** Importance and need	6
3,4,5	(a) Classification of industries (b) Role of agro-processing industries in the Indian economy.	10
6, 7, 8, 9, 10, 11	**Types of agrobased industries**-sugar mills, cotton ginning mills, dal mills, rice mills, poha mills, fruit processing industries e.g. NOGA (Nagpur Orange Growers Association)	8
12, 13	(a) Institutional arrangement (b) Steps in setting up of agro-based industries.	8
14, 15	Constraints in establishing agro-based industries.	10
16, 17, 18, 19	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.	6
20, 21, 23	Growth and modernization of these Agro based industries in different regions – Modernization of industries.	10
24, 25	Five Year Plans: Planwise development.	6
26, 27, 28	Employment and income generation from agro based industries at macro level and overall impact in the development of the region /State	6
29, 30	Potential agro-based industries- Grape wine making industries, soybean-processing industries, mango pulp processing industries.	5
31, 32	Govt. policies relating to agro-processing industries. Problems of agro-processing units. guidelines for financing of agro-processing industry in India.	5

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.

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SEMESTER – III

Course No. : AGRO-233
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 important crops, Consumptive use and evapotranspiration, different irrigation efficiencies. **Irrigation methods:** border, check basin, furrow, sprinkler and drip irrigation. **Sprinkler irrigation:** types, components, design and layout and care and maintenance. **Drip irrigation:** Types, components, design and layout and care and maintenance. Fertigation and filtration aspects of micro-irrigation. Introduction to other pressurized irrigation system, rain gun, porous pipe etc.

LESSION PLAN

Lecture No.	Topic	Weightage
2	Water resource development and utilization in India	9
1	Importance of irrigation,	8
2	Soil water plant relationship	10
1	Measurement of soil moisture, irrigation water, infiltration.	8
1	Water requirement of important crops, Consumptive use and evapotranspiration	10
1	Different irrigation efficiencies.	7
2	Irrigation methods: border, check basin, furrow, sprinkler and drip irrigation	12
2	Sprinkler irrigation: types, components, design and layout and care and maintenance	10
2	Drip irrigation: Types, components, design and layout and care and maintenance.	10
1	Fertigation and filtration aspects of micro-irrigation	8
1	Introduction to other pressurized irrigation system, rain gun, porous pipe etc	8
16	TOTAL	**100**

PRACTICALS

1. Determination of soil moisture by gravimetric method
2. Measurement of irrigation water by weirs, orifice 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. Fertigation through different devices.
7. Study of different components of sprinkler irrigation system.
8. Estimation of irrigation efficiencies.
9. Cost economics of drip/sprinkler system and other pressurized irrigation systems.
10. Care and maintenance of micro-irrigation system.
11. Study of different filtration system.
12. Visit to different pressurized irrigation system manufacturers

No. of Practical(s)	Name of the practical	Weightage
1	Determination of soil moisture by gravimetric method	8
1	Measurement of irrigation water by weirs, orifice and flumes.	8
1	Measurement of infiltration and analysis of infiltration rate	6
2	Estimation of water requirement by different methods.	10
2	Study of different components of drip irrigation system	10
1	Fertigation through different devices.	8
1	Study of different components of sprinkler irrigation system.	10
1	Estimation of irrigation efficiencies	8
2	Cost economics of drip/sprinkler system and other pressurized irrigation systems.	10
1	Care and maintenance of micro-irrigation system	6
1	Study of different filtration system	8
2	Visit to different pressurized irrigation system manufacturers	8
16	**TOTAL**	**100**

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. II, Jain Brothers, Jodhpur.
4. Shivnappan, R.K. Sprinkler Irrigation. Oxford IBM Publishing Co. Pvt.Ltd., New Delhi.
5. Shivnappan, R. K. Drip Irrigation. Keerti Publishers House, Trivandraum
6. Radhey Lal. Irrigation Hydraulics. Saroj Prakashan, Allahabad

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Course No. : HORT-232
Title : Production Management of Important Vegetable and Floriculture Crops
Credit : 2=1+1

THEORY

Vegetable: Definition, scope and importance of vegetable crops, area, production, distribution, exports and imports of vegetables from Maharashtra and India. Nutritive value, classification of vegetables, type of vegetable farming – kitchen garden, market garden, truck garden, vegetable production for processing, vegetable seed production, role of growth regulators in vegetable production. Cultivation of major vegetables like tomato, potato, chilli, brinjal, onion, garlic, peas, beans, cabbage, cauliflower, carrot, radish, watermelon, cucumber, muskmelon, bitter gourd, bottle gourd, ridge gourd, red pumpkin, sponge gourd, snake gourd and minor vegetables like methi, coriander, palak, amaranthus, lettuce, drumstick, tondali.

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.

(Give brief cultivation information in tabular form for minor vegetable and flower crops).

LESSION PLAN

Lecture No.	Topic	Weightage
1	**Vegetable:** Definition, scope and importance of vegetable crops, area, production, distribution, exports and imports of vegetables from Maharashtra and India.	12
2	Nutritive value, classification of vegetables, type of vegetable farming – kitchen garden, market garden, truck garden, vegetable production for processing, vegetable seed production	12
1	Role of growth regulators in vegetable production.	6
2	Cultivation of major vegetables like tomato, potato, chilli, brinjal, onion, garlic, peas, beans, cabbage, cauliflower	12
2	carrot, radish, watermelon, cucumber, muskmelon, bitter gourd, bottle gourd, ridge gourd, red pumpkin, sponge gourd, snake gourd	10
1	Minor vegetables like methi, coriander, palak, amaranthus, lettuce, drumstick, tondali.	6
1	**Floriculture:** Importance and scope of floriculture industry in Maharashtra and India.	12
2	Horticulture gardening. Principles of garden design (Formal and Informal garden and Land scaping),	6

1	Garden features, land scaping of homes, educational institutes, hotels, resorts, city parks and industries, road side planting.	6
2	Production technology of rose, chrysanthemum, aster, carnation, jasmine, marigold, gladiolus, tuberose, gaillardia, orchids, anthurium, gerbera and dahlia.	12
1	Brief cultivation information in tabular form for minor vegetable and flower crops	6
16	**TOTAL**	**100**

PRACTICALS

Identification of vegetable and ornamental plants. Planning and layout of kitchen garden. Raising and transplanting of vegetable seeds and seasonal flowers. Study of garden features. Seed extraction in tomato and brinjal. Planting of lawns and its maintenance. Potting, repotting and maintenance of indoor plants. Training and pruning of roses and pinching and disbudding in chrysanthemum. Planning and layout of gardens and garden designs for public and private areas. Intercultural operation in vegetable and ornamental/flower crops. Identification of important pests and diseases of vegetable and floricultural crops. Harvesting indices of different vegetables. Grading and packaging of vegetable and flowers. Flower arrangement and prolonging the vase life of cut flowers. Working out cost of cultivation of vegetable and floricultural crops (one crop each). Visit to commercial vegetable and floriculture gardens.

No. of Practical(s)	**Name of the practical**	**Weightage**
2	Identification of vegetable and ornamental plants.	14
2	Planning and layout of kitchen garden.	12
2	Raising and transplanting of vegetable seeds and seasonal flowers. Study of garden features.	10
1	Seed extraction in tomato and brinjal. Planting of lawns and its maintenance.	6
1	Potting, repotting and maintenance of indoor plants.	6
1	Training and pruning of roses and pinching and disbudding in chrysanthemum.	8
1	Planning and layout of gardens and garden designs for public and private areas.	8
1	Intercultural operation in vegetable and ornamental/flower crops.	6
1	Identification of important pests and diseases of vegetable and floricultural crops.	6
1	Harvesting indices of different vegetables. Grading and packaging of vegetable and flowers.	8
1	Flower arrangement and prolonging the vase life of cut flowers.	6
1	Working out cost of cultivation of vegetable and floricultural crops (one crop each)	6
1	Visit to commercial vegetable and floriculture gardens.	4

16	**TOTAL**	**100**

REFERENCE BOOKS

1. Bose, T. K., Som, M. C. and Kabir. Vegetable Crops. Naya Prokash, Calcutta.
2. Chaudhari, B. Vegetables. National Book Trust of India.
3. Bose, T. K. and L. P. Yadav. Commercial Flowers. Naya Prokash, Calcutta.
4. Radha, J. H. and A. Mukhopadhay. Floriculture in India. Allied Publishing Pvt. Ltd., New Delhi.
5. Prasad, S. 2005. Commercial Floriculture. Agrobios (India), Jodhpur.
6. Singh, A. K. 2006. Flower Crops: Cultivation and Management. New India Publishing Agency, NIPA.
7. Gopalkrishnan, T. R. 2007. Vegetable Crops. (Hort. Science Series Vol. 4). New India Publishing Agency, NIPA.

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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.

LESSION PLAN

Practical No.	Topic	Weightage
1	Layout, Design and requirement of soil , water and plant analysis laboratory	3
1	Determination of soil texture by feel method	3
1	Determination of Bulk Density of soil by cold and core method	4
1	Determination of moisture contain by gravimetric method	3
1	Determination of soil PH	3
1	Determination of soil E.C.	3
1	Determination of $caco_3$ of soil .	4
1	Determination of organic carbon from thr soil by soil wet oxidation	4

	method	
1	Determination of available N in the soil by alkaline per magnate method.	3
1	Determination of available P in soil by Olsen's method	3
1	Determination of available K in soil by flame photometer method	3
1	Determination of micronutrient in soil	3
1	Determination of secondary nutrient Ca, Mg, S in the soil.	3
1	Determination of exchangeable cations Na, K	3
1	Determination of cation exchange capacity	3
1	Determination of exchangeable sodium percentage	3
1	Determination of gypsum, requirement of alkali soils	3
1	Determination of lime requirement of acid soils	3
1	Determination of Critical values of nutrients in soils	3
1	Determination of computation of NPK fertilizer requirement as per fertilizer prescription equation for different crops	3
	IRRIGATION WATER ANALYSIS	
1	Determination of pH,	4
1	Determination of EC	3
1	Determination of cations and anions	3
1	Determination of SAR and RSC	3
1	Determination of criteria for irrigation water suitability, city and agro industrial effluents.	3
	PLANT ANALYSIS	
1	Determination of total N in plants	3
1	Determination of total P in plants	3
1	Determination of total K in plants	3
1	Determination of total Ca, Mg and S in plants	3
1	Determination of Fe, Mn, Zn, Cu, B and Mo in Plants.	3
1	Determination of critical values of nutrients in plants	3

1	Determination of plants nutrient diagnostic norms	3
32	**TOTAL**	**100**

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.

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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, poultry care and management of livestock and poultry i.e. calf, heifer, milking animal, dry animal, pregnant animal, draft animal and breeding bull, stress management. Housing of different livestock and poultry. Routine farm management. Preparation of animal for different purposes. Various breeds of cattle , sheep, goat, buffalo and poultry. Nutrient requirement of livestock and poultry. Maintenance of records on livestock dairy and poultry farms. Animal health cover, structure of udder and letting down of milk, clean and hygienic milk production. Reproductive systems of male and female, estrus cycle, pregnancy and parturition. Systems of breeding, artificial insemination.

LESSION PLAN

Lecture No	Topic	Weightage
1	Scope of livestock in Indian economy.	7
1	Livestock census and trend of livestock production.	5
2	Terminology used in livestock care, poultry care and management of livestock and poultry i.e. calf, heifer, milking animal, dry animal, pregnant animal, draft animal and breeding bull, stress management.	12
2	Housing of different livestock and poultry. Routine farm management.	14
1	Preparation of animal for different purposes.	5
3	Various breeds of cattle , sheep, goat, buffalo and poultry.	18
1	Nutrient requirement of livestock and poultry.	4
1	Maintenance of records on livestock dairy and poultry farms.	5

1	Animal health cover,	5
1	Structure of udder and letting down of milk, clean and hygienic milk production.	8
1	Reproductive systems of male and female, estrus cycle, pregnancy and parturition.	**8**
1	Systems of breeding,	**5**
1	Systems of artificial insemination.	**4**
17	**TOTAL**	**100**

PRACTICALS

Study of body parts of different classes of livestock, i.e. cattle, buffaloe and poultry. Handling and control of animals. Routine practices on livestock and poultry farms. Vaccination schedules of livestock and poultry. Record keeping, judging of animals for dairy and draft purpose, instruments and equipments used in AI. Layout of various dairy structures. Utilization of dairy farm wastes. Disposal of milk.

No. of Practical(s)	Name of the practical	Weightage
3	Study of body parts of different classes of livestock, i.e. cattle, buffaloe and poultry.	12
2	Handling and control of animals.	10
2	Routine practices on livestock and poultry farms.	10
1	Vaccination schedules of livestock and poultry.	10
2	Record keeping, judging of animals for dairy and draft purpose,	12
1	Instruments and equipments used in AI.	12
2	Layout of various dairy structures.	12
2	Utilization of dairy farm wastes.	12
1	Disposal of milk	10
16	**TOTAL**	**100**

REFERENCE BOOKS

1. Banerjee, G. C. Text Book of Animal Husbandry. Oxford and IBM Publishers, New Delhi.
2. Sashry, N. S. R, 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.

Singh, R. A. Poultry Production. Publishers, New Delhi.

Course No. : ENGG-232
Title : Post-Harvest Technology for Cereals, Pulses, Oilseeds and Cash crops
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, disadvantages of parboiling, oil expression and extraction. Screw and hydraulic methods. Material handling equipments (excluding design), Principles of refrigeration, and cold storage.

LESSION PLAN

Lecture No.	Topic	Weightage
1	Importance of Post harvest technology.	5
1	Problems occurring in harvesting, threshing, transport, drying, milling and marketing.	8
2	Moisture content and its measurement. Drying and its importance: Methods of drying grains.	12
1	Thin layer and deep bed drying (excluding mathematical expression).	5
2	Equilibrium moisture content (excluding mathematical expression). Grain dryers	12
2	Food grain storage structures. Bulk storage structures.	12
2	Unit operations in seed processing. Equipments for cleaning, sorting, grading and separation.	12
2	Technology of parboiling of paddy. Principles of parboiling, advantages, disadvantages of parboiling	12
2	oil expression and extraction. Screw and hydraulic methods. Material handling equipments (excluding design)	12
1	Principles of refrigeration, and cold storage.	10
16	**TOTAL**	**100**

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.

No. of Practical(s)	**Name of the practical**	**Weightage**
1	Study of different moisture measuring methods.	10
1	Study of various types of grain dryers	5
1	Study of different types of sieves and screens.	5
1	Study of cleaning equipments	10
1	Study of graders and separators	10
1	Study of belt, screw conveyers and bucket elevators (excluding design)	10
1	Study of modern rice milling machineries	5
1	Study of pulse milling (Flow charts of wet milling and dry milling of pulses)	10
1	Study of vapour compression system of refrigeration	10
1	Study of refrigerated storage / cold storage	10
1	Study of mechanical expression devices (Hydraulic press and screw press)	10
1	Economics of drying methods	5
12	**TOTAL**	**100**

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.

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Course No. : PATH – 231
Title : Integrated Disease Management
Credit : 2=1+1

THEORY

Introduction, History of Plant Pathology: History and development of Plant Pathology in different eras, contribution made by different scientists in IDM, and significant plant diseases. Definitions and objectives of Plant Pathology: Concepts of disease, Important plant pathogenic organisms: Different groups like fungi, bacteria, fastidious bacteria, viruses and phytoplasma with examples of diseases caused by them, Disease: economic importance and losses caused by plant diseases, basic procedures in the diagnosis of plant diseases. Definition of IDM, concept, advantage and importance, principle approaches to IDM: Direct action against the pathogen, genetic modification of the host to resist disease and modification of the environment. Exclusion: Legislation (Quarantines, Regulation measures), eradication, protection. Epiphytotic diseases, epidemic and diseases forecasting in IDM. Present status of fungicides / bio-agents in India, their use and restriction in plant disease control. Integrated control in a perennial crops, and annual crops. 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. Post-harvest diseases of important crops and their management.

LESSION PLAN

Lecture No	Topic	Weightage
1	Introduction, History of Plant Pathology: History and development of Plant Pathology in different eras, contribution made by different scientists in IDM, and significant plant diseases.	5
1	Definitions and objectives of Plant Pathology: Concepts of disease,	5
1	Important plant pathogenic organisms: Different groups like fungi, bacteria, fastidious bacteria, viruses and phytoplasma with examples of diseases caused by them,	5
1	Disease: economic importance and losses caused by plant diseases, basic procedures in the diagnosis of plant diseases	5
1	Definition of IDM, concept, advantage and importance,	5
1	principle approaches to IDM: Direct action against the pathogen, genetic modification of the host to resist disease and modification of the environment.	10
1	Exclusion: Legislation (Quarantines, Regulation measures), eradication, protection.	5
1	Epiphytotic diseases, epidemic and diseases forecasting in IDM.	10
1	Present status of fungicides / bio-agents in India, their use and restriction in plant disease control.	5

1	Integrated control in a perennial crops, and annual crops. Development of IDM strategy for important crops *viz.*, cotton, groundnut,	5
1	Sunflower, sorghum, bajra, rice	5
1	Wheat, sugarcane, grape	5
1	Banana, pomegranate, mango, citrus,.	5
1	Fig, guava, tomato, potato,	5
1	Chilli, okra, brinjal, cabbage and cauliflower	10
1	Post-harvest diseases of important crops and their management.	10
16	**TOTAL**	**100**

PRACTICAL

Acquaintance to Plant Pathology laboratory and equipments, Preparation of culture media for fungi and bacteria, Isolation techniques, Demonstration of Koch's postulates, Collection, preparation of mounts, and diagnosis of disease samples and their preservation. Isolation of pathogens from the collected samples and their identification. IDM components and implementation of IDM strategies. Phytosanitory measures and certification. Impact of IDM implication. Fungicides: fungicide formulations, commonly available fungicides in market and method of their application. Bio-agents: Different bioagents, their methods of application and diseases controlled. Visits to field / orchard, visit to bio agent mass multiplication laboratory.

No. of Practical(s)	Name of the practical	Weightage
1	Acquaintance to Plant Pathology laboratory and equipments	10
1	Preparation of culture media for fungi	5
1	Preparation of culture media for bacteria,	5
1	Study of Isolation techniques,	10
1	Demonstration of Koch's postulates,	10
1	Collection, preparation of mounts,	5
1	Diagnosis of disease samples and their preservation.	5
1	Isolation of pathogens from the collected samples and their identification..	5
1	IDM components and implementation of IDM strategies.	5
1	Phytosanitory measures and certification. Impact of IDM	5

	implication.	
1	Fungicides: fungicide formulations, commonly available fungicides in market and method of their application.	10
1	Bio-agents: Different bioagents, their methods of application and diseases controlled.	5
2	Visits to field / orchard,	10
2	visit to bio agent mass multiplication laboratory	10
16	**TOTAL**	**100**

REFERENCE BOOKS

1. Singh, R. S. Introduction to principles of plant pathology. Oxford and IBH Pub. Co., New Delhi.
2. Pathak, V. N. Essentials of plant pathology. Prakash Pub., Jaipur
3. Agrios, G. N. Plant pathology. 5th edition, Published by a division of Reed Elsvier India Pvt., Ltd., New Delhi (2005)
4. Kamat, M. N. Introductory Plant Pathology. Prakash Pub, Jaipur
5. Singh, R. S. Plant diseases
6. Alexopoulos, Mims and Blackwel. Introductory Mycology Introductory Plant.
   Dube, H.C. Pathology.

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Course No. : EXTN-232
Title : Communication Skills and Market-led Extension for Business Management
Credit : 2=1+1

THEORY

Communication: Meaning, Concepts and definitions, Process of Communication, Importance and Types of Communication. Barriers to effective communication, improving Communication Effectiveness, Models and Theories of Communication, Organizational Communication, feedback– problems in communication, Interpersonal Communication, Effective business communication, Presentation skills, Business writing skills, speed reading, listening skills, Nonverbal Communication and Body Language, drafting the Message, Defining the Audience Delivery Skills, Visual Aids, Designing Effective Visual Aids, Using Visual Aids Effectively, Principles and Techniques of making Presentations with impact, Using Technology wisely.

Market-led Extension: Meaning, definition and importance of market –led-extension. Areas of extension education in marketing, Marketing Network for Agricultural Products, Production of Agricultural products distributed in different pockets of the country, Food availability and its consumption in India, Transportation, Storage – Types, Costs, Returns etc Rules, regulation and their impact on implementation of marketing network , Linking of entire marketing networking system for agricultural products.

LESSION PLAN

Lecture No.	Topic	Weightage

1	**Communication**: Meaning, Concepts and definitions	8
1	Process of Communication, Importance and Types of Communication.	6
1	Barriers to effective communication, improving Communication Effectiveness	6
1	Models and Theories of Communication, Organizational Communication, feedback– problems in communication	6
1	Interpersonal Communication, Effective business communication	6
1	Presentation skills, Business writing skills, speed reading, listening skills	6
1	Nonverbal Communication and Body Language, drafting the Message, Defining the Audience Delivery Skills	6
1	Visual Aids, Designing Effective Visual Aids, Using Visual Aids Effectively	6
1	Principles and Techniques of making Presentations with impact, Using Technology wisely.	6
1	**Market-led Extension:** Meaning, definition and importance of market – led-extension. Areas of extension education in marketing	8
1	Marketing Network for Agricultural Products	6
1	Production of Agricultural products distributed in different pockets of the country	6
1	Food availability and its consumption in India	6
1	Transportation, Storage – Types, Costs, Returns etc	6
1	Rules, regulation and their impact on implementation of marketing network	6
1	Linking of entire marketing networking system for agricultural products	6
16	**TOTAL**	**100**

PRACTICAL

Participative Exercises, Lectures, Presentation Film, Visual Aids, Video Recording and Replay, Evaluations and Feedback, Assessment Questionnaires, Role Plays, Games, Exercises, Group Activities, Discussions, Writing Workshops, Brain Storming, Assignments, Training Film ,Review and Evaluations, Reading Skills practices, Speed and Comprehension checks. Study of APMC with reference to market led extension activities. Study of Case studies of Market Led Extension. Visit to Progressive farmers applying market Led Extension Strategy.

No. of Practical(s)	**Name of the practical**	**Weightage**
1	Participative Exercises, Lectures	8

1	Presentation Film, Visual Aids,	8
1	Video Recording and Replay,	8
2	Evaluations and Feedback, Assessment Questionnaires,	10
1	Role Plays,	8
1	Games, Exercises	8
1	Group Activities, Discussions,	6
2	Writing Workshops, Brain Storming, Assignments,	10
2	Training Film ,Review and Evaluations	10
1	Reading Skills practices, Speed and Comprehension checks.	6
1	Study of APMC with reference to market led extension activities.	6
1	Study of Case studies of Market Led Extension.	6
1	Visit to Progressive farmers applying market Led Extension Strategy.	6
16	**TOTAL**	**100**

REFERENCE BOOKS

1. Acharaya, S.S. and N.L. Agarwal. Agricultural Marketing in India. Oxford and IBH Publishing Co.Pvt. Ltd., New Delhi.
2. Chalapati Rao I.V. Communication and leadership, skills and strategies. Book links Corporation, Hyderabad.
3. David K. Berlo. The process of communication – An introduction to theory and practice. Holt, Rine hart and Winston, New York.
4. Eshwar Prasad, Y. Short course on Market Intelligence and IT in Agriculture. Acharya N.G. Ranga Agricultural University, Rajendranagar, Hyderabad, Andhra Pradesh
5. Legans, J.P. The Communication Process. Extension Education in Community Development, Directorate of Extension, Ministry of Food and Agriculture, Govt. of India, New Delhi.
6. Mcgrath, S .J. Basic Managerial Skills for all. Prentice Hall of India Pvt. Ltd., New Delhi.
7. Mishra Anupam. Commodity Futures – Challenges from growth. The Hindu Survey of Indian Industry.
8. Pattabhiram B.V. Art of Communication. Emesco Books, Vijayawada.
9. Ray, G.L. Extension communication and management. Naya Prakash, Calcutta.
10. Wakhul Arun. Managing from the heart. Unfolding spirit in people and organizations, Reponse books, New Delhi.
11. Wiseman Gordon and Barker Larry. Speech /interpersonal communication\chandler publishing company. New York and London.

Important web resources :

1. www.mcxindia.com
2. www.fao.org.com
3. www.commodityindia.com
4. www. agricoop. nic.in

5. www.nmce.com

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Course No. : ECON-235
Title : Agricultural Co-operation, Institutions and Management
Credit : 3=2+1

THEORY

Co-operation: Meaning, definition, principles of co-operation and its application in agriculture. Importance and role 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. 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.

LESSION PLAN

Lecture No	Topic	Weightage
1	Co-operation meaning and definitions	5
3	Principles of Co-operation	10
1	Importance of Co-operation in Indian Agriculture	5
1	Role Of Co-Operation In Rural Development	5
3	Co-operative Movement in India and in Maharashtra	5
1	Co-operation compared with Capitalism and Socialism	5
1	Co-Operative Education and Training	5
7	Agricultural Finance ,Marketing and Processing Institutions	15
1	Nationalization of Banks, Multi Agency Approach	5
4	Agricultural Refinance And Development Corporation (ARDC), National Co-operative Development Corporation (NCDC), State Bank of India and Rural Credit, Reserve Bank of India, state cooperative union.	10
2	Types of Co-operative Societies	10
4	Co-operative Management: Nature and functions of management. Co-operative Management and Professionalism	10
3	Co-operative administration and HRM. Role of Leadership in Cooperative Management	10
32	**TOTAL**	**100**

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.

No. of Practical(s)	Name of the practical	Weightage
1	Study of Primary Agricultural Cooperative Credit Society	10
1	Study of District Central Co-Operative Bank	10
1	Study of State Co-Operative Bank	10
1	Study of Maharashtra State Co-Operative Agricultural and Rural Development Bank and Procedure for Advancing Loans	10
2	Study of Co-Operative Processing / Processing Co-Operatives. Study of Co-Operative Marketing	10
2	Preparation of Loan Proposals for Obtaining Loans and Scrutiny of Proposals	10
2	Formulation of Loan Proposal for Obtaining Agricultural Finance for Crop Production	10
2	Study of Economic Feasibility Tests of Farm Credit Proposals – Three R's Of Credit Three C's Of Credit	10
1	Study of Forms of cooperatives	5
1	Study of National Cooperative Development Corporation (NCDC)	5
2	Study of processing of cereals, pulses and oilseeds managed by co-operatives	10
16	**TOTAL**	**100**

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.

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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).Coffee Board and Rubber Board.

LESSION PLAN

Lecture No.	Topic	Weightage
4	Objectives, structure and functioning of Agricultural Marketing Institutions and Organizations.	**20**
2	Agricultural Produce Market Committee,	**15**
2	Cotton Corporation of India and State Cotton Federation,	**5**
1	Food Corporation of India (FCI),	**5**
1	State Trading Corporation (STC),	**3**
1	National Co-operative Marketing Federation,	**3**
2	Agricultural Processed Products and Export Development Authority (APEDA),	**10**
2	Maharashtra State Agricultural Marketing Board (MSAMB),	**5**
2	The National Agricultural Co-operative Marketing Federation of India (NAFED),	**5**
1	Jute Corporation of India,	**3**
1	Tobacco Board,	**3**
1	Coconut Board,	**3**
1	Grape Growers Association (Mahagrape),	**2.5**
1	Mango Growers Association (Mahamango),	**2.5**
1	The Directorate of Marketing and Inspection (DMI),	**5**
2	National Dairy Development Board (NDDB).	**5**

1	Coffee Board.	**2.5**
1	Rubber Board	**2.5**
27	TOTAL	**100**

PRACTICALS

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

No. of Practical(s)	**Name of the practical**	**Weightage**
1	Study of National Dairy Development Board	7
1	Study of Tobacco Board.	6
1	Study of Food Corporation of India	7
1	Study of Cotton Corporation of India	6
1	Study of Jute Corporation of India	6
1	Study of Agriculture Processed Food Product Export Development Authority. (APEDA)	7
1	Study of National Oilseed and Vegetable Oil Development Board (NOVOD)	7
1	Study of National Agricultural Cooperative Marketing Federation of India. (NAFED)	7
1	Study of Cooperative Societies MAHAMANGO	6
1	Study of Cooperative Societies MAHAGRAPE	6
1	Study of APMC	7
1	Study of Council of State Agricultural Marketing Board (COSAMB)	7
1	Study of State Trading corporation (STC)	7
1	Study of Directorate of Marketing and Inspection (DMI)	7
1	Study of state cooperative marketing society	7
15	**TOTAL**	**100**

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.

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Course No. : MKT-233
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.

LESSION PLAN

Lecture No.	Topic	Weightage
2	Scope and importance of agricultural input marketing management.	8
5	Study of demand and supply scenario of major agro-inputs: seeds, fertilizers, agro-chemicals, farm machineries and electricity	20
3	Production organizations in seeds, fertilizes, agro-chemicals.	10
2	New product development, product introduction.	8
2	Branding and packaging for major agro-inputs.	8
1	Formulation of marketing strategy.	4
2	Marketing, planning and implementation for agro-inputs..	8
3	Market promotion – Advertising, personal selling, sales promotion and publicity.	10
2	Sales force management.	8
1	Management of distribution system for major agro-inputs.	4
1	Pricing of agro inputs.	4
1	Information system for input marketing.	4
1	Short term credit loan for procurement of inputs	4
26	**TOTAL**	**100**

PRACTICALS

1. Visit to seed organizations (MSSC, Mahabeej, NSC 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 of local market to know potentiality of different crop seeds, fertilizers, various plant protection chemicals and farm machineries.

No. of Practical(s)	Name of the practical	Weightage
2	Visit to seed organizations (MSSC, Mahabeej, NSC etc.) – Study of production, pricing, transportation and promotion of seeds.	10
1	Study of Chemical fertilizer production Units.	10
3	Public sector, Co-operative Sector, Private Sector Companies and their products range (seeds, fertilizers, agrochemicals)	30
1	Study of Demand and Supply of chemical fertilizers and gap therein.	10
1	Types of agro-chemicals used as agricultural inputs.	10
2	Visit to Agricultural Exhibition. Role of Agricultural exhibitions in marketing of Agro-inputs.	15
2	Market survey of local market to know potentiality of different crop seeds, fertilizers, various plant protection chemicals and farm machineries	15
12	**TOTAL**	**100**

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.

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Course No. : ABM-233
Title : Office procedures for Agri-business
Credit : 1=0+1

PRACTICALS

Practicals based on office documents, drafting (Letter, demi-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 offices. Study of these offices and their functioning.

LESSION PLAN

No. of	Name of the practical	Weightage

Practical(s)		
1	Study of Drafting Business Letter	5
1	Study of Drafting Enquiry Letter	5
1	Study of quotations	5
1	Study of Replies to the Enquiry Letter	5
1	Study of drafting the Order Letter	5
1	Study of drafting the Complaint Letter	5
1	Study of drafting the Sales Letter	5
1	Study of Report Writing	10
1	Study of Filing System	10
1	Study of Indexing	10
1	Study of payments, billing and preliminary requirements,	10
1	Study of publication procedure	5
2	Visits to ISO (International Standard Certificate) certificate organisations	10
2	Visit to Government and private offices. Study of these offices and their functioning.	10
16	**TOTAL**	**100**

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.

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SEMESTER – IV

Course No. : HORT-243
Title : Post-Harvest Technology of Horticultural Crops
Credit : 3=2+1

THEORY

Importance and present status of post harvest technology in horticultural crops in India and Maharashtra. Maturity, harvesting and handling in relation to extended shelf-life and storage quality of fruits, vegetables and flowers. Maturity and harvesting indices of fruits, vegetables and flowers. 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, vegetables and flowers. Importance and scope of fruits and vegetable 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.

LESSION PLAN

Lecture No.	Topic	Weightage
2	Importance and present status of post harvest technology in horticultural crops in India and Maharashtra.	7
4	Maturity, harvesting and handling in relation to extended shelf-life and storage quality of fruits, vegetables and flowers.	12
2	Maturity and harvesting indices of fruits, vegetables and flowers.	6
2	Factors responsible for maturity, ripening and deterioration of horticultural produce.	6
2	Methods used for harvesting and post-harvest treatment for delaying ripening.	6
1	Respiration and transpiration rate during packaging and storage.	6
2	Methods of pre-cooling, grading, packaging, storage and transport of fruits, vegetables and flowers.	6
2	Importance and scope of fruits and vegetable preservation.	6
2	Selection of site for fruit and vegetable preservation unit.	6
2	Principles and methods of preservation.	6
2	Preparation of jams, jellies, marmalades, squashes	6

2	Preparation of juices, syrups, preserves, crystallized fruits,	6
2	Preparation of chutney, pickle and ketchups.	6
2	Spoilage of processed products.	6
1	Post harvest management of cut flowers.	3
2	Control of post harvest diseases of important fruits and vegetables.	6
32	**TOTAL**	**100**

PRACTICALS

Studies on 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, marmalades, squashes, juices, 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.

No. of Practical(s)	**Name of the practical**	**Weightage**
1	Studies on Maturity indices, harvesting of various fruits and vegetables.	8
1	Pre-cooling, grading, packaging and storage of fruits and vegetables.	8
1	Pre-harvest and post-harvest application of chemical substances.	8
1	Harvesting, packaging, storage and marketing of cut flowers.	8
1	Identification of different equipments used in processing of fruits and vegetables.	8
1	Canning of fruits and vegetables.	8
2	Preparation of jams, jellies, marmalades.	8
2	Preparation of squashes, juices, syrups,	8
2	Preparation of preserves, ketchup, pickles, chutney, etc.	8
1	Drying of fruits and vegetables.	6
1	Working out the economics of important processed products.	8
1	Study of spoilage of different processed products.	6
1	Visits to fruits and vegetables preservation units.	8
16	**TOTAL**	**100**

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-Post, 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.
5. Shrivastva, R.D and Kumar Sanjeev. Fruits and Vegetables(Principle and Practices). 3rd Edition.

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Course No. : ASDS -242
Title : Value Addition in Animal Products
Credit : 2=1+1

THEORY

Present status of dairy, poultry, meat, wool and hide industries in WTO regime. Milk composition of different species. Production, packing, marketing of milk, meat and their products. Import, export of animal and poultry products. Utilization of animal dung, poultry manure for F.Y.M. and vermi compost, gobar gas production and its valuation, price regulation in animal products. Factors influencing price. Trends in marketing and utilization of animal products. Importance of hides and bones, quality standards and storage. Market standards and regulation of animal products.

LESSION PLAN

Lecture No	Topic	Weightage
1	Present status of dairy	7
2	Present status of poultry, meat, wool	13
1	Hide industries in WTO regime.	5
2	Milk composition of different species. Production, packing, marketing of milk, meat and their products.	15
2	Import, export of animal and poultry products.	8
3	Utilization of animal dung, poultry manure for F.Y.M. and vermi compost, gobar gas production and its valuation, price regulation in animal products.	25
1	Factors influencing price.	4
2	Trends in marketing and utilization of animal products.	8
1	Importance of hides and bones, quality standards and storage.	8
1	Market standards and regulation of animal products.	7

16	**TOTAL**	**100**

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 and poultry products.
4. Study of different marketing systems for animal and poultry products.
5. Processing and preservation of animal products for marketing.
6. Different packaging materials useful for animal and poultry products.
7. Visit to existing marketing structures of animal products, co-operatives and private organizations.
8. Different methods of slaughtering the animals, poultry and their effects on quality of products.

No. of Practical(s)	**Name of the practical**	**Weightage**
1	Organoleptic quality and evaluation of milk and milk products-	10
2	Organoleptic quality and evaluation of meat, egg, wool and chicken.	10
1	Physical properties of milk,	10
1	Physical properties of meat, egg, wool and chicken.	10
1	Chemical composition of different animal and poultry products.	10
2	Study of different marketing systems for animal and poultry products.	10
2	Processing and preservation of animal products for marketing..	10
2	Different packaging materials useful for animal and poultry products.	10
2	Visit to existing marketing structures of animal products, co-operatives and private organizations.	10
2	Different methods of slaughtering the animals, poultry and their effects on quality of products	10
16	**TOTAL**	**100**

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. Fundamentals of Dairy Chemistry. Publishers Van Nastrand Rain hold Comp. New York.
5. Ling, E.R. Text Book and Dairy Chemistry. Chapman Hall Ltd., London.

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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.

LESSION PLAN

Lecture No.	Topic	Weightage
2	Definition of statistics, meaning, scope, statistics and industry, its applications, uses and misuses of statistics in business.	6
2	Frequency distribution, raw data, the array frequency distribution, determining classes and class interval, cumulative frequency distribution. Graphic presentation of data.	6
3	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.	12
3	Dispersion, Range, Mean Deviation, Variance, Standard Deviation, Properties of SD, relative measures of dispersion for grouped and ungrouped data,	12
3	Skewness, Kurtosis and moments.	8
3	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.	12

4	Discrete probability distribution. Binomial and Poisson distribution and its parameters. Normal distribution, its properties and procedure of fitting the normal curve.	12
4	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.	12
5	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.	12
3	Time series and index number analysis.	8
32	**TOTAL**	**100**

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 indices.

No. of Practical(s)	**Name of the practical**	**Weightage**
1	Classification of data (problems on exclusive and inclusive classification).	5
1	Computation of AM, GM, HM, Median, Mode for discrete	10

	ungrouped data and grouped data.	
1	Computation of AM, GM, HM,. Median and Mode for continuous series	5
1	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.	10
1	The computation of range, MD, variance, standard deviation, standard error and CV coefficient of MD for grouped data.	5
1	Student's 't' test for one sample, paired 't' test and unpaired 't' test and 'F'-test.	10
1	Computation of χ^2 for one sample 2 x 2 and n x k contingency table.	5
1	Calculation of correlation coefficient and regression coefficient. Y = a + bx, $X = a^1 + b^1y$ and testing significance of r and b.	10
1	Computation of three variable multiple linear regression equation by using matrix inverse and testing significance of partial regression coefficient and R^2 .	5
1	Fitting of Binomial and Normal distribution.	5
1	Fitting of linear, semi-log parabolic trend equations to time series data.	5
1	Fitting of modified exponential, Gompertz, and Logistic growth curve.	5
1	Seasonal variations-By methods of simple averages and ratio to moving average method.	5
1	Seasonal variations by ratio to trend method and method of link relatives.	5
1	Measurement of cyclic and irregular variation.	5
1	Construction of Index Numbers. Procedure of base shifting, deflation of indices.	5
16	**TOTAL**	**100**

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

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Course No. :.EXTN-243
Title : Consumers Psychology in Business Management
Credit : 2=1+1

THEORY

Psychology: Concept, Meaning, definitions, scope and importance. **Perception:** Meaning, definitions, determinants of perceptions, general principles, errors in perceptions. **Attitude:** Meaning and

characteristics, formation of stereotypes and prejudices, factors in attitude change. **Consumer buying:** The decision making process. Consumer information processing, consumer learning process. **Consumer preferences:** Post-purchase processes, situational influence. Social classes and buying behaviour. **Emotion:** Concept, meaning, definition, motivation and emotion, type of emotion, theories of emotion, expressive components of emotions. **Learning:** Definition, principles, indicators theories of learning and experimental learning, factor affecting learning. **Consumer spending:** Consumer spending and savings, consumer behaviour and the marketing manager, product positioning, marketing mix development.

LESSION PLAN

Lecture No	Topic	Weightage
2	**Psychology:** Concept, Meaning, definitions, scope and importance.	12
2	**Perception:** Meaning, definitions, determinants of perceptions, general principles, errors in perceptions.	12
2	**Attitude:** Meaning and characteristics, formation of stereotypes a prejudices, factors in attitude change.	12
2	**Consumer buying:** The decision making process. Consum information processing, consumer learning process.	12
2	**Consumer preferences:** Post-purchase processes, situatio influence. Social classes and buying behaviour.	12
2	**Emotion:** Concept, meaning, definition, motivation and emotic type of emotion, theories of emotion, expressive components emotions.	14
2	**Learning:** Definition, principles, indicators theories of learning a experimental learning, factor affecting learning.	12
2	**Consumer spending:** Consumer spending and savings, consum behaviour and the marketing manager, product positionir marketing mix development.	14
16	**TOTAL**	**100**

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.

No. of Practical	Name of the practical	Weightage
1	Law of demand	8
1	Law of supply.	8
1	Engle's law of family expenditure..	8

1	Elasticity of demand	8
1	Elasticity of supply.	8
1	Law of diminishing marginal utility.	8
2	To workout the income and expenditure pattern consumers,	12
2	Household surveys for consumers preferenc programme,	20
2	market survey of commodity choices and relevant factors	20
12	**TOTAL**	**100**

REFERENCE BOOKS

1. Atwater F. Psychology for leaving, Adjustment, Growth and Behaviour Today. Prentice Hall of India, New Delhi.
2. Back C. Robert. Psychological factors at work, Recognition and control ILO, Geneva, Occupational Safety and Health Series No.56.
3. Back C. Robert. Apply Psychology Understanding People. Prentice Hall Engle woods Cliffs, New Jersey.
4. Baron, R.A. Psychology. Prentice Hall of India, New Delhi.
5. Chakraborty, Ajitha. Social stress Mental Health, A Social Psychiatric field study of Calcutta. SAGE Publication, New Delhi.
6. Chattopadhyaya, Aparna. What's your emotional IQ. Pustak Mahal, New Delhi.
7. Davar, Bhargavir and Parmeshvar Bhatt. Psychology analysis as a human science beyond fundamentalism. Sage Publication, New Delhi.
8. Morgan, C.T. Klng, R.a. Robinson, N.M. Introduction to psychology – Tata M. Graw Hill Publishing Co., New Delhi.
9. Hans Raj Bhatia. A Textbook Educational Psychology.
10. Rogers, Evertt M. Diffusion of Innovations, New York The Free Press.
11. Shiffman, L.G. and L.L. Kaunk. Consumer Behaviour. Prentice-Hall of India Pvt. Ltd., M-97, Connaught Circle, New Delhi. 110001.

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Course No. : ECON- 246
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, National Insurance 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.

LESSION PLAN

Lecture No.	Topic	Weightage
2	**Agricultural policies:** Meaning, types and importance, evolution of agricultural policy	5
2	Famine Commission Report	5
2	Royal Commission on Agriculture: Recommendations	5
2	Drought Prone Area Programme (DPAP)	5
1	Land Reform Policy	4
1	National Insurance Policy	4
2	Nature and objectives of land reforms	5
2	Tenancy reforms, Crash Scheme for Rural Development	5
3	Major agricultural input policies including seed, fertilizer, pesticides, credit and irrigation.	10
2	National Rural Employment Programme	5
1	Abolition of Bonded Labour	4
1	Jawahar Rojgar Yojana	4
2	Employment Assurance Programme and other recent Agricultural Development Programmes.	5
1	New Agricultural Export Policies for different commodities.	4
1	**National Forest Policy**	5
1	National Forest Policy of 1952	5
1	Forest Policy of 1988	4
1	Forest Development Programme	4
1	Social Forestry	3
1	Animal Husbandry	3
1	Dairy Improvement in cattle breeding	3
1	Government policy regarding Animal Husbandry and Poultry Development.	3

32	**TOTAL**	**100**

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.
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. : 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 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.

LESSION PLAN

Lecture No.	Topic	Weightage
3	Rural marketing, definition, classification, strategies.	12
4	Characteristics, changing pattern of rural market, problems in rural marketing.	12
3	Rural marketing in India – Difference between urban and rural market. Study of rural resources.	5
2	Rural marketing and research – Sources for conducting marketing research, dos and don'ts for rural marketing and rural industries.	10
3	Rural segmentation - Targeting and positioning.	10
5	Rural product and prices – Introduction, packing, pricing methods, rural branding.	12

3	Rural distribution / channels of distribution,	12
1	Functions of rural sales persons.	5
5	Rural communication – Introduction, types, factors affecting rural communication, problems.	12
3	Market infrastructure – Meaning, facilities included and its importance.	10
32	**TOTAL**	**100**

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.

No. of Practical(s)	Name of the practical	Weightage
4	Profile study of local market.	30
4	Profile study of weekly market.	30
3	Study of market yard.	20
5	Study of grading unit. Study of method of sale.	20
16	**Total**	**100**

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.

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Course No. : MKT- 245
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.

LESSION PLAN

Lecture No.	Topic	Weightage
2	**Retailing:** Concept, types of retailers	10
2	Supermarkets, factory outlets, hypermarkets. Non- store retailing.	10
3	Retailer-marketing decisions. Direct selling, one to one selling, one to many selling, direct marketing and multilevel marketing.	8
3	Major types of retail organisation, co-operative chain stores, voluntary chain, retailers and consumers cooperatives.	12
4	Retail Chain Management by Corporate Houses. Procurement decision. Price, promotion and place decision	10
4	Role of Consumer, Packaging and Market Segmentation in Retail Marketing.	12
4	**Store Management:** Retail location, merchandising, using price to stimulate market sale.	12
4	**Branding Strategy:** Manufacturer's brand	8
3	Private label, brand for a sale	8
3	Trends in retailing. Retailing strategy. Impact of retailing on economy and society	10
32	**TOTAL**	**100**

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.

No. of Practical(s)	Name of the practical	Weightage
3	Studies and surveys of different types of retailing stores (public, private and co-operative) in the jurisdiction.	20
2	Case studies of major types of retailing stores.	20
2	Studies of retailers carrying out different marketing functions.	20

1	Study of market segmentation for retail market.	20
2	Study of corporate retail-chain stores.	20
10	**TOTAL**	**100**

REFERENCE BOOKS

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

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Course No. : ABM-244
Title : Disaster Management in Agriculture
Credit : 2=1+1

THEORY

Disaster Management-Meaning, scope, and importance. Types of disasters- (i) Natural disasters-Earthquake, floods, landslides, hail storms, cyclones, fires, winter freezing, lightening, volcano, tornado, tsunamis, hurricanes, droughts etc. (ii) Man made disasters-War, bomb blasts, chemical leakage, fire etc.
Types of damage- Damage to life, property, and utility services, etc.
Assessment and reporting of damage - Damage assessment methods, damage in physical and monetary terms
Forewarning –Systems and communication measures- prospective, preventive, and protective.
Remedial and precautionary measures-Insurance, Government aid, NGOs etc. Training, education and knowledge of the disaster events for precautions.
Case studies-Different types of disasters-Drought, floods, hailstorms, heavy rainfall, winter freezing, fire, etc.
Government policies- regarding the disasters. Role of NGOs, co-operative and private institutes.

LESSION PLAN

Lecture No.	Topic	Weightage
2	**Disaster Management**-Meaning, scope, and importance.	10
5	Types of disasters- (i) Natural disasters-Earthquake, floods, landslides, hail storms, cyclones, fires, winter freezing, lightening, volcano, tornado, tsunamis, hurricanes, droughts etc. (ii) Man made disasters-War, bomb blasts, chemical leakage, fire etc.	20
2	**Types of damage-** Damage to life, property, and utility services, etc.	10
1	**Assessment and reporting of damage** - Damage assessment methods, damage in physical and monetary terms	15

1	**Forewarning** –Systems and communication measures- prospective, preventive, and protective.	10
1	**Remedial and precautionary measures**-Insurance, Government aid, NGOs etc. Training, education and knowledge of the disaster events for precautions	10
2	**Case studies**-Different types of disasters-Drought, floods, hailstorms, heavy rainfall, winter freezing, fire, etc.	15
2	**Government policies-** regarding the disasters. Role of NGOs, co-operative and private institutes.	10
16	TOTAL	**100**

PRACTICALS

Locating the areas of disaster events.

Studies of different disaster events- Droughts, heavy rainfall, floods, winter freezing, fire, bomb blasts, scorching summer, riots etc.

Study of Government policies in managing the disasters.

No. of Practical	**Name of the practical**	**Weightage**
4	Locating the areas of disaster events.	10
1	Studies of different disaster events- Droughts,	10
1	Study of heavy rainfall,	10
2	Study of floods,	10
1	Study of winter freezing	10
1	Study of fire	10
2	Study of bomb blasts,	10
1	Study of scorching summer	10
1	Study of riots	10
2	Study of Government policies in managing the disasters.	10
16	TOTAL	**100**

REFERENCE BOOKS

1. Ghosh, G. K. Disaster Management. A. P. H. Publishing Corporation.
2. Singh, R.B. Disaster Management. Rawat Publications.

3. Ayaz Ahmad. Disaster Management Through the New Millennium. Anmol Publications.
4. Narayan, B. Disaster Management. A. P. H. Publishing Corporation.
5. Bose, B.C. Modern Encyclopaedia of Disaster and Hazard Management. Rajat Publications.

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SEMESTER – V

Course No. : EXTN-354
Title : Information Technology in Agri-Business.
Credit : 2=1+1

THEORY

Information Technology: meaning, role and importance in Agri business and Agriculture marketing, Importance of Common Service Centres (CSC), Common issues of CSCs, Expert decision support system in Agriculture, Information Technology for Agriculture marketing, On line market information, online market status in India, e-commerce in Agriculture, Advantages of e-commerce over traditional marketing, electronic auction, websites on Agriculture marketing and export, role of private companies in online marketing –e-Chaupal, HLL Shakti etc Futures Trading in Agricultural Commodities, database Management.

Lect. No.	Name of the Topic	Weightage
1.	Information Technology : Meaning and its role	5
2.	Importance of IT in Agriculture – Business and Agri – marketing	5
3 & 4	Importance of common service centers (CSC) and common issues of CSC's	10
5.	Expert decision suppose system.	5
6.	Information technology for Agriculture marketing	5
7 & 8	On-line market information and online market status in India	10
9 & 10	E-commerce in Agriculture and advantages of E-commerce in Agriculture over traditional market.	15
11 & 12	Electronic auction website on Agriculture marketing and Export	15
13	Role of Private companies in online marketing e – Chaupal	10
14	HLL Shakti etc future trading in Agri kcommodities	5
15	Database Management	15

PRACTICALS

Visit to Common service centre, visit to agriculture market committee for studying on line marketing, Compilation of various case studies of online agriculture marketing, assignment on detailed study of Agriculture marketing website, presentation on use of IT in Agribusiness.

Pract. No.	Name of the Topic	Weightage
1 & 2	Visit to common service centre	20
3 & 4	Visit to Agriculture Market Committee for studying on-line agricultural marketing.	20
5 & 6	Compliation on various case studies of online agriculture marketing	20
7,8 &9	Assignment on detail study of Agril. Marketing website	20
10, 11 & 12	Presentation on use of IT in Agri-Business.	20

REFERENCE BOOKS

1. Paul McConnell. Measuring the impact of information on development . IDRC,1995
2. Ramarao, T. P., V. Venkatarao, S.C. Bhatanagarand and J. Satyanarayana. E- governance assessment frameworks (EAF version 2.0) May 2004 (http//:egov.mit.gov.in/NISG_ EAF_18-05-04.pdf)
3. Recciuti, M. Database vendors hawk wares on Internet. InfoWorld, 17-2,Jan.9, 10.
4. Melone, T, Yates, J and Benjamin, R. Electronic Markets and Hierarchies. CACM, 485
5. Hema Yadav and Satyavir Singh. Information Technology for Agricultural Marketing-Challenges and Prospects. Training Note of Media and Cyber Extension, MANAGE, Hyderabad
6. Acharya, S.S. and N.L. Agarwal. Agricultural Marketing in India. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Anonymous. Workshop on AGMARKNET: Internet based Agricultural Marketing Network to support Agricultural Marketing Extension. National Institute of Agricultural Extension Management, Rajendranagar, Hyderabad, Andhra Pradesh.
8. Eshwar Prasad, Y. Short course on Market Intelligence and IT in Agriculture. Acharya N.G. Ranga Agricultural University, Rajendranagar, Hyderabad, Andhra Pradesh.
9. Mishra Anupam. Commodity Futures–Challenges from growth. The Hindu Survey of Indian Industry.
10. Shah Jignesh. Commodity Future- Benefits start flowing in. The Hindu Survey of Indian Industry.

Important web resources:

11. www.mcxindia.com,
12. www.fao.org.com
13. www.commodityindia.com,
14. www.agricoop.nic.in
15. www.nmce.com,
16. www.agmarknet.nic.in

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Course No. : ECON- 357
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.

LESSON PLAN

Lect.No	Name of the Topic	Weightages
1.	Nature and scope of input-output relationship	08
2.	Concept of production	06
3.	Factor –Product relationship	08
4.	Forms of Production function	08
5.	Characteristics of production function	06
6.	Production Surfaces	06
7.	Isoquants,Isoclines and their economic application	08
8.	Quantitative estimation of parameters of input-output relationship and their interpretation	06
9.	Principle of choice and resource allocation	06
10.	Price and product relationship	08
11.	Resource Substitution	08
12.	Cost minimization	08
13&14	Resource combination and enterprise combination	08
15&16	Returns to scale and farm size	06

PRACTICALS

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

Pract. No.	Title of the Practical	Weightages
1&2&3	Estimation procedure of linear production function ,interpretation and economic application	20

4&5&6	Estimation procedure of quadratic production function, interpretation and economic application	20
7&8&9	Estimation procedure of Cobb-Douglas production functions by OLS method, interpretation and economic application.	20
10&11&12	Returns to scale and farm size examples.	20
13&14&15	Derivation of cost and supply functions from production function.	20

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.

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Course No : ECON- 358

Title : Research Methods in Social Sciences

Credits : 2=1+1

THEORY

Science: Definition, meaning, goals, functions, types of sciences. **Scientific Method:** Features, induction and deduction, steps involved in scientific investigation. **Research:** Definition, classification, importance of research in agricultural economics, research methods in agricultural economics, steps in agricultural economics. **Research Problem:** Definition, nature, selection, components, formulation of hypothesis characteristics and functions of hypothesis. **Sampling:** Meaning, need for sample, sampling methods with their merits and demerits. **Data:** Source, types, methods of data collection, observation, interview, questionnaire, schedule analysis, inferences and reporting of research.

LESSON PLAN

Lecture No.	Name of the topic	Weightage
1	Science: Meaning ,goals functions ,types of science	7
2	Scientific methods: Induction and deduction	8

3	Steps involved in the scientific investigation	8
4	Research: Definition, classification	7
5	Importance of research in agricultural economics	6
6	Research methods in agricultural economics ,steps in agricultural economics	6
7	Research problems: Definition, nature, selection, components	8
8	Formulation of hypothesis	7
9	Characteristics and functions of hypothesis	4
10	Sampling: Meaning, need for sample	7
11	Sampling methods with their merits and demerits	8
12	Data: Source, types, methods of data collection	7
13	Observation, interview, questionnaire	7
14	Schedule analysis	5
15	Interference and reporting of research	6
	Total	100

PRACTICALS

1. Source of information in social sciences
2. Planning of research and identifying the problem
3. Guideline for successful interviewing
4. Guideline for constructing schedule/questionnaire
5. Selection of appropriate method of sampling and selection of sample by Random Sampling Technique
6. Mechanics of Analysis and Interpretation of Data
7. Diagrammatic Representation of research results
8. Case study and its merits and demerits

Practical No.	**Name of the topic**	**Weightage**
1	Sources of information in social science	6
1.A	Primary source	4
1.B.	Secondary source	4

1.C	Tertiary source	4
2 &3	Planning of research and identifying the problems	8
4	Guideline for successful interviewing	4
5	Guideline for constructing schedule	4
6	Guideline for constructing questionnaire	4
7	To study the different methods of sampling	10
8	Selection of appropriate method of sampling	8
9	Selection of sample by Random sampling Technique	8
10	Mechanics of analysis and interpretation of data	8
11	Diagramatic representation of research result	8
11 A.	Pie diagram	6
11 B	Bar diagram	6
12	Case study and its merits and demerits	8
	Total	**100**

REFERENCE BOOKS

1. Goode, W.J and Hatt, P.K. Methods in Social Research. McGraw – Hill Book Company New Delhi
2. Eilkinson TS and Bhandarkar. Methodology and Techniques of Social Research, Mrs Meena Panday for Himalaya Publishing House, " Ramdoot DR. Bhalerao Marg, Girgaon Mumbai – 400 004.

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Course No. : MKT- 356
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, udid etc. Average cost of processing wheat into wheat flour, paddy to rice, whole pulses in to split pulses, 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.

LESSON PLAN

Lecture No.	Name of The Topic	Weightage
1	Importance of Agril commodities in Agricultural Marketing	4
2	Marketing of Cereals- Rice	8
3	Marketing of Wheat	8
4	Marketing of Jowar	8
5	Marketing of Pulses-Gram	7
6	Marketing of Mung	9
	Marketing of Tur & Udid	
7	Average cost of processing Wheat in Wheat Flour	5
8	Average cost of Processing Paddy in to Rice	5
9	Processing of Whole Pulses into Split Pulses	5
10	Comparison of different rice milling methods	5
11	Study of Price Spread of important Agrils Products & producer's shares in consumer rupee	5
12	Marketing of Fruits	8
13	Marketing of Vegetables	8
14	Improving efficiency in commodity marketing	5
15	Role of Regulated Market in Commodity Marketing	5
16	Role of Co-operative market in commodity Marketing	5
	Total	100

PRACTICALS

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

Practical No.	Name of the practical	Weightage

Practical No.	Name of The Practical	Weightage

1,2	Marketing cost, market margins, producers share in consumer rupee for rice	20
3,4	Marketing cost, market margins, producers share in consumer rupee for wheat	20
5,6	Marketing cost, market margins, producers share in consumer rupee for Jowar	15
7,8	Marketing cost, market margins, producers share in consumer rupee for Gram	15
9,10	Marketing cost, market margins, producers share in consumer rupee for Mung	10
11,12	Marketing cost, market margins, producers share in consumer rupee for Mango and citrus	10
13,14	Marketing cost, market margins, producers share in consumer rupee for vegetables	10
	Total	100

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.

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Course No. : MKT - 357
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 Marked 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-1954. 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 Warehousing Corporation Act- 1957. National Co-operative Warehousing Board Act -1956. State Warehousing Corporation Act - 1958. Weighing and Measurement Act. NAFED, FCI, Export- Import Policy- 2002-2007

LESSON PLAN

Lect. No.	Name of the topic	Weightage
1	Evolution of Market legislation	**5**
2-3	Market legislation Meaning need	**5**
4-5	Scope of Market legislation	**5**

5-6	Growth and development of regulated markets	**5**
7-8	Review of Agril. Produce Market	**3**
9-11	Regulated Markets, Organisations, Constitution of market committee, source of income.	**10**
12	Functions of Market Committee	**5**
13-14	Agril. Produce (Grading and Marking) Act,1937.	**5**
15	AGMARK	**3**
16	Cold Storage order, 1964	**3**
17	Cold Storage, 1980	**3**
18	Food Product Order, 1955.	**3**
19	Meat Food Production Order, 1977.	**3**
20-21	Prevention of Food Adulteration Act, 1954	**5**
22	All India credit survey Committee Report, 1954	**3**
23	Maharashtra Agril. produce marketing (Regulation) Act, 1963.	**3**
24-25	New Marketing model Acts	**3**
26	Consumer Protection Act, 1986.	**5**
27	Central warehousing Corporation Act, 1957.	**5**
28	National Co-operative warehousing Board Act, 1956.	**3**
29	State warehousing corporation Act, 1958. Weighing and Measurement Act.	**5**
30	NAFED, its functions	**5**
31-32	Export-Import Policy 2002-2007.	**5**

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

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Course No. **: ABM – 355**
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.

LESSON PLAN

Lecture No.	Name of The Topic	Weightage
1	Introduction of Inventory	5
2	Cycle of inventory management	8
3,4	Order Quantity , Economic Order Quantity (EOQ)	12
5	Order Point, Safety stock	10
6	Pricing of raw material and valuation stock	8
7,8	Monitoring and control of inventories	12
9	Criteria for judging inventory system	10
10	Inventory management in India	5
11,12	Storage and warehousing	10
13	Inventory record keeping and their types	5
14	Risk, meaning and importance	5
15,16	Type of risk, minimization of risk	10
	Total	100

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.

Practical No.	Name of The Practical	Weightage
1,2,3	Estimation of Economic Order Quantity	20

4,5	Estimation of cost of carrying and ordering inventories	20
6,7	Estimation of optimal level of safety stock	20
8,9	Visit to two different manufacturing companies for observing their working in inventory and stock management	20
10,11	Hypothetical examples on risk minimization	20
	Total	100

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
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.

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Course No. : ABM – 356
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.

Lecture No	**Topics in the Syllabus.**	**Weightage (%)**
1.	Agro-tourism: Introduction, importance, scope	10
2.	Forms of agro-tourism, advantages and implementations introduction to Indian culture.	6
3.	Govt. policies and legislations in respect of tourism	6
4.	Agro-tourism and environment protection laws.	5
5.	Requirements for Agro-tourism. Farm, forest, garden, fish tank/ponds, residential huts, etc.	6
6.	Constraints in operation and management of Agro-tourism activities.	8
7.	Management of resources – Human resources, Natural resources.	6
8.	Garbage management at Agro-tourism centre.	4

9.	Entrepreneurship development: Role and functions.		6
10.	Hospitability: Food and beverages and accommodation services.		6
11.	Communication skill and service.		6
12.	Capital investment, sources and capital budgeting.		5
13.	Project proposal- Preparation and feasibility tests		10
14.	Accounts and record keeping etc.		4
15.	Marketing strategies for Agro-tourism products and services.	8	
16.	Publicity of tourism- Advertisement and use of media.	4	

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.

Practical No.	Name of the practical	Weightages(%)
1- 3.	Visit to various nearby agro-tourism centres.	30
4 -6	Study of different types of Agro- tourism centres and services offered by them.	30
7-10	Report on agro-tourism project.	40

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).

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Course No. : ABM - 357
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.

LESSON PLAN

Lect.No.	Topic to be Covered	Weightages
1.	Information, meaning and role of production management in agriculture, elements of Production, design and process Planning	5
2.	Effect of technological changes on the production management, factors influencing the plant location in Agri-business activities	10
3.	Agricultural Production Planning and Control : Nature, basic functions of Production, Planning and Control its objectives, different systems of manufacture production cycle.	15
4.	Scheduling and control of production and its control procedures and devices. Total quality management,	10
5.	considerations, stages of quality control, standard and specifications, quality assurance and quality circles	10
6.	scheduling psychology, methodology and control techniques, legal aspects of quality control.	5
7.	Resource Planning and Budgeting : Importance and techniques	5
8.	Methods to study work measurement, Nature and Objectives of Production Planning and control.	10
9.	Variables subject to control. Production control for contentment's, intermittent and project system.	5
10.	Production forecasting and production Inventories, Aggregate Planning, guidelines, graphic and chart planning	10
11.	Resource Management, Management or resources, meaning, concept, source of supply of material, selection and evaluation	5
12.	Purchase management – cost reduction, store management location, storage methods and documentation of Government Policies.	10

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.

Practical No.	Name of practical	Weightages
1.	Study of production management aspects of selected agri-business units.	5
2.	Visits to selected agri-business units.	5
3.	Discussion with entrepreneurs.	5
4.	Points to be considered while preparing the reports on agri-business management	10
5.	Layout-example of large enterprise that consist of many small and medium plants.	5
6.	Scheduling a planning function and expedition control function of small firms.	5
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.	10
8.	Production planning and control: Nature, basic functions of production planning and control, its objectives, variants in different system of manufacture production cycle.	10
9.	Resource planning and budgeting – Importance and technique, work study, method of study, work measurement	5
10.	Source of supply of material-selection and evaluation	5
11.	Purchase management- Cost reduction, store management, Location, storage method and documentation	5

12.	Institutions engaged in providing service/facilities	5
13.	Government policies.	5
14.	Production control for contemns, entrepreneurs and project system.	5
15.	Production forecasting and production inventories	5
16.	Total quality management, consideration. Stages of quality control. Quality control standards, specifications, quality assurance and quality circles.	10

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.

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Course No. : ABM-358
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 products 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.

LESSON PLAN

Lecture No.	Topic / Topics in Syllabus	Topic / Topics to be covered
1	Role of agro-processing industries in the Indian economy	Importance of agro-processing industries, Definitions, advantages, Role of agro-processing in the Indian economy, Food processing – the sunrise sector
2	Status and potential of Indian agro-processing industries	Status and potential of Indian agro-processing industries (present production figures, sector-wise no. of processing units in India), Sub-sectors of food processing,
3 &4	Status of various agro-processing sectors i.e.	Status & processing (only flow-chart) of:

	foodgrains, commercial crops, fruits and vegetable processing, livestock processing, fishery products etc.	i) Foodgrains: a) rice processing industries b) wheat processing industries c) pulses processing d) oilseeds processing. ii) Fruits and vegetable processing industries iii) Livestock processing: a) meat and poultry b) milk and dairy industries iv) Fish processing
5 & 6	A policy environment of agro-processing industries-development, management structure and communication	1) Government institutes and Departments dealing with food processing: i) CFTRI- objectives ii) FPO, iii) National Horticulture Board iv) Food & Nutrition Board, v) Fruit Preservation & Canning Institute, vi) APEDA – objectives, 2) Impetus to food processing – Changing food habit of urban Indians (ready to eat / cook) 3) Indian consumer behavior as regards to buy processed food 4) Impediments to the growth of processed food industry
7	Work performance efficiency	SWOT (Strengths, Weakness, Opportunities, Threats) analysis of agro-processing industries in India
8	Public contact and public participation in agro-processing industries	Public contact and public participation in agro-processing industries
9	Decision making process& entrepreneurial efficiency	Decision making process and entrepreneurial efficiency
10, 11, 12 & 13	Government policies relating to agro-processing units	1) Government initiatives in promoting the food-processing industries 2) Various sectors under Department of Food Processing Industries 3) Policy adopted by Department of Food Processing Industries 4) Plan and Strategy to develop agro-processing industry 5) Plans of Ministry of Food Processing Industry (10^{th} & 11^{th} Plan) 6) Legal aspects relating to the food processing

		industries in India 7) Establishment of Export Processing Zones (EPZs) – infrastructure, benefits 8) National Policy and Food Processing 9) Infrastructural Development – Backward & Forward linkage
14	Interdependence of agro-processing industries	Interdependence of agro-processing industries
15	Problems of agro-processing units	Challenges before food processing industries, Problems of food wastage, Characteristics of agro-processing industries in India
16	Guideline for financing of agro-processing industries in India	Investment in the food processing sector in India, Guidelines regarding foreign investment in the food processing sector

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.

Practical No.	Title of the Practical
1	Preparation of proposal for Ginning & Pressing industries.
2.	Preparation of proposal for Spinning Mill.
3.	Preparation of Proposal for Edible Oil Mill.
4.	Preparation of proposal for Dal Mill.
5.	Preparation of proposal for Sugar factories.
6.	Preparation of proposal for Milk processing unit.
7.	Preparation of proposal for Wine making unit.
8.	Preparation of proposal for Rice Mill.
9.	Preparation of proposal for Mango processing unit.
10.	Preparation of proposal for Tomato processing unit.

11.	Determination of per unit cost of processing and net profit per unit.
12.	Estimation of net profit per annum and break Break Even Point for given processing unit.
13.	Visit or Study of ago-processing industries of different commodities – Foodgrains, Fruits and Vegetables, Milk and Milk Products.

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.

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Course No. : ABM- 359
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.

LESSON PLAN

Lect.No.	Name of the topics	Weightage (%)
1,2	Understanding marketing management.	8
3	Marketing concept.	3
4	Marketing mix.	3
5	Market segmentation and market targeting.	6
6	Building consumer satisfaction,value and retention.	8
7,8	Managing the marketing process and market planning.	6

9	Development of marketing strategies.	9
10	Positioning and differentiating the market offering through product-life-cycle.	8
11	Developing new market offerings.	9
12	Designing global market offerings.	8
13,14	Shaping the market offerings,setting the product and brand strategy.	8
15	Designing and managing services.	9
16	Developing price strategies and programme.	8
17	New economic policies for agriculture sector.	7
	Total	100

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.

Practical No.	**Name of the practical**	**Weightages**
1,2.	Study of marketing strategies of agro-based products(select any two food-grain products)	12
3,4.	Study of marketing strategies of agro-based products(select any two dairy products)	12
5,6.	Study of marketing strategies of agro-based products(select any two fruit products)	12
7,8.	Study of marketing strategies of agro-based products(select any two vegetarian products)	12
9,10.	Study of marketing strategies of agro-based products(select any two non-vegetable products)	12
11,12.	Case studies on "Managing product life cycle"(select any two company products)	14
13,14.	Study on different marketing activities carried out by different companies.	12

15,16.	Visit to advertising agencies promoting agro-based products working in the locality.	14
	Total	100

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.

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SEMESTER – VI

Course No. : PATH - 362
Title : Bio-fertilizers and Mushroom Production
Credit : 2=1+1

THEORY

Bio-fertilizers: Introduction, importance and definition. Types of bio-fertilizers. Growth characteristics of microbial agents used in preparation of biofertilizers. Methods of preserving cultures of microorganisms used in production of biofertilizers. Types of micro-organisms: Phosphate solublising micro-organisms. Nitrogen fixation by Microorganisms (*Azotobacter*, *Azospoirilium*, *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: Introduction, importance and types of mushrooms. Study of morphology and nutritive and medicinal values of mushrooms. Edible and poisonous mushrooms. Requirements for mushroom cultivation: different tools, equipments, substrates and chemicals required for commercial cultivation of mushroom.

LESSON PLAN

Lect.No	Topic to be Covered	Weightages
1	Introduction, Importance and definition	**5**
2	Types of biofertilizers	**10**
3	Growth characteristics of microbial agents used in preparation of biofertilizers. Methods of Preserving cultures of micro-organism.	**5**

4	Types of micro-organisms:- Phosphate solublising micro-organisms. Nitrogen fixation by micro-organisms (*Azatobacter, Azospoirilium, Rhizobium, Acetobacter, Blue green algae* and *Azolla* VAM (*Vesicular Arbuscular Mycorrhiza*)	**5**
5	Application of biofertilizers.	**5**
6	Efficiency of biofertilizers.	**5**
7	Role of biofertilizers in nutrient availability and soil fertility	**5**
8	Beneficial role of micro-organism	**5**
9	Harmful Micro-organism in plant growth.	**5**
10	Economics of bio-fertilizers production	**5**
11	Introduction, Importance and types of mushrooms	**10**
12	Study of morphology and nutritive and medicinal values of mushrooms	**15**
13	Edible and poisonous mushrooms	**5**
14	Requirement of mushroom cultivation	**10**
15	Different tools, Equipments, Substrates	**5**
16	Commercial Cultivation of mushrooms	**5**

PRACTICALS

Biofertilizers production:

Equipments, machinery and tools used for biofertilizer production and culture transfer technique using laminar flow cabinet. Estimation of microbial population of soil. Isolation, identification and maintenance of beneficial soil microorganisms *viz., Azotobacter, Azospirillum, Acetobacter, Rhizobium,* blue green algae, phosphate solubilizing bacteria, and cellulose decomposing microbes. Preparation of plates and slants of various laboratory nutrient media for production of biofertilizers and isolation of microorganisms. Production of different commercial formulations of biofertilizers. Quality control of biofertilizers: ISI standards specified and estimating the viable count in carrier based biofertilizers. Storage of biofertilizer packets. Visit to biofertilizer plants. Cost of production, marketing, finance/ subsidies schemes, project proposals, loans, etc. Technology transfer, farmer's cooperatives (case study), motivation, training/visits

Mushroom production:

Acquaintance with autoclaving and preparation of nutrient media required for growing cultures of different mushrooms. Techniques for isolation of mother culture of mushroom on nutrient media and methods of preservation of mushroom cultures. Demonstration of mushroom cultivation: substrate pasteurisation, spawning and bed preparation, spawn run observations, cropping management, maintenance of temperature and humidity in cropping room and harvesting. Management of diseases of mushrooms. Management of insect pests of mushrooms. Preparation of different recipes of mushroom and methods of preservation. Harvesting, packing, Cost of production, marketing, finance/ subsidies schemes, project proposals, loans, etc. Economics of mushroom cultivation. Visit to mushroom project.

Practical	**Name of Practicals**	**Weightages**

No		
1.	Equipments, machinery and tools used for biofertilizer production and culture transfer techniques using Laminar flow cabinate.	**5**
2. (A) **(B)**	Estimation of microbial population of soil by serial dilution techniques Estimation of soil micro organism by direct microscopic count.	**8**
3. (A) **(B)**	Isolation and Identification and Maintainance of *Azotobactor* from soil Isolation of *Azospirilium* .	**8**
4. (A) **(B)**	Isolation of *Acetobacter* and Isolation of *Rhizobium* from root nodules of leguminious crops.	**8**
5. (A) **(B)**	Isolation of *Blue green algae* (BGA) and Isolation of phosphate solubilizing Bacteria.	**8**
6. (A) **(B)**	Isolation of cellulose (organic matter) decomposing microorganics and study of their character Preparation of plates and slants of various laboratory nutrient media for production of biofertilizers and isolation of microorganisms	**8**
7.	Production of different commercial formulation of biofertilizers and application methods of carrier based biofertilizers.	**5**
8.(A) **(B)**	Standards of commercial biofertilizers and procedures for testing them Storage of biofertilizers packages	**5**
9.	Visit to biofertilizers plants	**5**
	Mushroom production	
10.(A) **(B)**	Materials and equipments required for commercial cultivation of mushroom Preparation of nutrients culture and techniques for isolation of mother culture of mushroom	**5**
11. (A)	Demonstration of mushroom cultivation-preparation of master and commercial spawn. Cultivation of mushroom and different methods of compost making,	**10**

(B)	spawning and bed preparation.	
12.	Casing and crop management maintenance of temperature, humidity and harvesting.	**10**
13.	Preventive and protective measures for different diseases of mushroom and management of insect pests	**2.5**
14.	Preparation of different recipes of mushroom and methods of preservation.	**2.5**
15.	Economics of mushroom cultivation and preparation of bankable project for commercial cultivation.	**5**
16.	Visit to mushroom project.	**5**

REFERENCE BOOKS

1. Dixon, R.O.D. and C.T. Wheeler. Nitrogen Fixation in plants. Blackie USA, Chapman and Hall, New York.
2. Motsara, I. M.R., P. Bhattacharyya and Beena Srivastava. Biofertilizer Technology, Marketing and Usage - A source Book -cum-glossary. FDCO, New Delhi.
3. Subba Rao, N.S. Biofertilizers in Agriculture and Forestry. Oxford and IBH Pub. Co., New Delhi P. 242.
4. Bahl, N. Handbook on Mushrooms. Oxford and IBH Pub. Co. Pvt, Ltd, New Delhi.
5. Chang, S.T. and P.G. Miles. Edible Mushrooms and Their Cultivation. CBS Pub., Delhi.
6. Nair, M.C. Mushrooms. Tech. Bull. No. 17. Kerala Agricultural University, Mannuthy, Thrissur (Kerala).
7. Singh, H. Mushrooms-the Art of Cultivation. Sterling Pub. Co., New Delhi-16.
8. Kapoor, J.N. Mushroom Cultivation. ICAR, New Delhi.
9. Kannaiyan, S. and K.A. Ramasamy. Handbook of Edible Mushrooms 1980. Today and Tomorrow. New Delhi.
10. Wani, P.V. and D.M. Sawant. Oyster- A Mushroom of Broad adaptability An Overview. J. Maharashtra agric. Univ. 23(3): 230-237.

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Course No. : EXTN-365
Title : Organizational Behaviour for Business Management
Credits : 2=2+0

THEORY

Organization and its analysis: Nature of organization, scope and significance of Organizational Behaviour, relevance of Organizational Behaviour in today's business environment. **Personality and Motivation:** Objectives, Introduction, Meaning, Personality determinants, Personality traits, Theories of Personality-Levinson's theory of adult life stages, Hall's Career Stage Model, Chris Argyris' immaturity to Maturity Continuum, Edgar Schein's Socialization process. **Motivation:** Types, Characteristics, Theories of motivation-Early theories and Contemporary theories. Motivation at different levels. How to motivate subordinates. **Team Building:** Introduction, Systematic Approach, Information stage, Reviewing in order to improve, Analyzing skills, Feedback of observations, Supportive development building on ideas, Contributions in a group, Degrees of Agreement, Aspirations.

Leadership Development: Understanding leadership, Theories of leadership-Trait theory, contingency theory, Situational leadership theory, Organizational theory, Power theory, Ethical Assessment theory,

Transactional or Transformational leadership. **Negotiation Skills:** Negotiation, simple Negotiation Model, Guidelines on negotiation, Positional bargaining, Positions and Interests.

Lect. No.	Topic to be Covered	Weightages
1.	Organisation and its analysis :- Nature of organization and its scope	3
2.	Significance of organization behaviour	3
3.	Relevance of organizational behaviour in today's Business environment	3
4.	Personality: Objectives, Introduction, and its meaning	3
5.	Personality determinants, personality traits	4
6 & 7	Theories of Personality : 1) Levinson theory of adult life 2) Hall's carrier stage model 3) Cheis algysis immaturity to maturity continuous 4) Edger schein's socialization process	3 3 3 3
8.	Motivation: Types, characteristics of motivation.	3
9.	Theories of motivation : Early theories	4
10.	Theories :- Contemporary theories.	4
11.	Motivation at different level.	4
12.	How to motivate sub-ordinates.	3
13.	Team Building :- Introduction & Systematic approach	3
14 & 15	Information stage, Reviewing in order to improve, Analysing skill, feed back of observation.	5
16, 17, & 18..	Supportive development building on ideas, contribution in group degrees of Agreement, Aspiration	5
19.	Leadership development :- Understanding leadership.	3
20.	Theories of leadership :- 1) Trait theory	3
21.	2) Contingency theory.	3
22.	3) Silvational leadership theory.	3
23.	4) Organisational theory.	3
24.	5) Power theory	3
25.	6) Ethical Assessment theory.	3

26.	Transactional or Transformational leadership.	2
27.	Negotiation skills :- Meaning of Negotiation.	4
28.	Simple Negotiation Model.	5
29.	Guidelines on Negotiation.	4
30.	Positional Bargaining and Position of interest.	5

REFERENCE BOOKS

1. Korman, Abrahim K-Organizational Behaviour.
2. Khanka, S.S.- Organizational Behaviour.
3. Singh and Chhabra-Organizational Theory and Behaviour.
4. Maslow, A.H.-Motivation and Personality.
5. Mattock, John- How to be better negotiator.

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Course No. : ECON- 368
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).

LESSON PLAN

Lect. No.	**Name of the Topic**	Weightages
1	Agricultural Project-Meaning, Types and their importance in development.	08
2	Economic and financial analysis of agricultural projects. .	08
3	Cost-benefit estimates of different types of projects.	06
4	Cash flow	06
5	Shadow price	06
6	Calculation of economic price	05
7	Comparing costs and benefits such as the Net Present Worth (NPW),the benefit –cost ratio(B:C ratio)	10
8	Pay –back period	05

9	Guidelines for building up costs and returns analysis	06
10	Project area-Characteristics and Components.	05
11	Project approach to agricultural leading enterprise.	07
12	Practical steps in project formulation.	06
13	Financial appraisal of a project.	06
14	Application of programme Evaluation and Review technique (PERT,CPM).	06
15	Sensitivity analysis.	05
16	Social cost –benefit analysis.	05

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.

Practical No.	**Name of the Practical**	Weightages
1 & 2	Project preparation for securing loan.	15
3 & 4	Estimation of measures of economic evaluation such as NPV/NPW	10
5 & 6	Estimation of measures of economic evaluation such as B:C ratio	10
7 & 8	Estimation of measures of economic evaluation such as IRR	10
9 &10	Estimation of measures of economic evaluation such as PBP	10
11	Sensitivity analysis to judge the economic viability of a project.	10
12&13	Complete project proposal	15
14	CPM-technique	10
15&16	PERT-technique	10

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.

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Course No. : ECON-369
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 creation and credit control. 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.

LESSON PLAN

Lecture No	Topics in the Syllabus	Weightage (%)
1	**Agriculture Finance:** Nature and scope, importance of agril. finance.	8
2	Agricultural finance as a part of public finance.	4
3.	Source of capitals	4
4.	Meaning and concept of agriculture credit	6
5.	Classification of credit.	6
6.	Forms of credit	4
7.	Credit as a tool of economic development.	5
8.	Cost of credit, interest rates of credit	3
9.	3 R's of credit	3
10.	5 C's of credit	5
11.	5 P's of credit	5
12.	Credit creation and credit control	3
13.	Credit rationing and planning.	3
14.	Legal aspects of credit	3
15.	Supervised credit	8
16.	Credit demand and supply, credit institution	3
17.	Credit policy and needed changes	3

18.	Preparation of proforma of income statement	4	
19.	Proforma of balance sheet and cash budget		5
20.	Portfolio management		2
21.	Financial ratio analysis	2	
22.	Break–even analysis.		5
23.	Investment analysis.		2
24.	Capital market.	2	
25.	Operations analysis.		2

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.

Practical No	Topics in the Syllabus	Weightage (%)	
1.	To study 3 R's of Agriculture credit.		10
2.	To study 5 C's of Agriculture credit.		10
3.	To study 5 P's of Agriculture credit.	10	
4.	To study Financial ratio analysis Liquidity ratio.		6
5.	To study Leverage ratios.		6
6.	To study Turnover analysis.		8
7.	To study Profitability ratios.		8
8.	To study Valuation ratios with their example	6	
9.	To study Comparative analysis.		8
10.	To study Application of financial statement analysis.	8	
11.	To study Break-even analysis.	10	
12.	To study Investment analysis.	10	

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. S. and Karam Singh. Managing Agricultural Finance - Theory and Practice. Allied Publisher Pvt. Lt., 165, J. N. Heredia Marg, Ballard Estate, Mumbai – 400 038.

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Course No. : MKT- 368
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, onion, ladies finger, brinjal. Existing levels of processing and future potential. Export and export potential.

Lecture	Name of the Topic	Weightage
1,2 &3	Marketing of commercial crops with special reference to all marketing functions and price analysis	12
4	Marketing of commercial commodities: Cotton	7
5	Marketing of commercial commodities: sugar cane ,	7
6	Marketing of Commercial commodities: Onion	6
7	Marketing of Commercial commodities: Banana	6
8	Marketing of Commercial commodities: citrus	6
9	Marketing of Commercial commodities: Mango	7
10	Marketing of Cut flowers: Roses, gerbera, gladiolus etc.	10
11	Marketing of Vegetables: Cauliflower, cabbage	9
12&13	Marketing of Vegetables: tomato, potato, onion, ladies finger, brinjal	10
14 &15	Existing level of agril. products processing and future potential	10
16	Export and export potential of agril. products	10
	Total	100

PRACTICALS

Practical exercises on performance of various marketing functions of selected commercial fruit and vegetable 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.

Practical No.	Name of the Practical	Weightage
1	Practical exercise on performance of various marketing functions of selected commercial fruit.	05
2	Performance of Marketing functions of Banana	10
3	Performance of Marketing functions of Citrus	10
4	Performance of Marketing functions of Mango	10
5	Practical exercise on performance of various marketing functions of selected vegetable crops.	10
6	Performance of Marketing functions of Cauliflower	10
7	Performance of Marketing functions of Cabbage	10
8	The estimation of marketing cost. Market margins and producer's share in consumer rupee of commercial crops	10
9	The estimation of marketing cost. Market margins and producer's share in consumer rupee of fruit crops	10
10,11,12	Visit to the various commodity markets eg. fruit market,	10

	foodgrain market, livestock market	
13,14,15	Visit to the processing units and their detail studies.	05
	TOTAL	**100**

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.

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Course No. : ABM – 3610
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.

LESSON PLAN

Lect. No.	Name of the Topic	Weightage
1& 2	Human Resources Management: Concept, Objectives, Nature and scope of the human resource	6
3 & 4	Planning: Problems in HR planning	5
5	Job Analysis, Job description & Job specification	5
6&7	Human Resource Acquisition – meaning, sources and methods.	5
8	Selection and Selection process	4
9&10	Placement, Induction, Socialization	5
11& 12	Development of Human Resources, Training: Importance, need, methods and procedures	6

13 & 14	Management Development Programmes – Purposes and Methods.	6
15	Strategic management, emergence of strategic management, need of strategic management.	4
16	Corporate strategy-concept, components and functions	4
17	Nature, components and significance of Environmental scanning	4
18 & 19	Analysing external environment, Opportunities and Threats-Economic, technological, competitive, political, social and cultural	6
20	Corporate capability analysis	3
21	Concept and significance of synergy and analyzing synergy	3
22	Core competence : concept, cosmic features	3
23 & 24	Value chain analysis and linkages.	6
25	Value system, significance in strategy making	4
26 & 27	Setting corporate objectives: concept, purpose, mission need & Process.	5
28 & 29	Forces interacting with corporate objectives, external and internal	6
30	Identifying strategic alternatives	4
31 & 32	Choice of Corporate strategies formulae, implementation &legitimacy CIT, CASCADE & PORTFOLIO models	6

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. Ellyn and Bacon, Boston.
3. Gary Dazzler. Human Resource Management.
4. Aswathappa, K. Human Resources and Personal Management.

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Course No. : ABM- 3611
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.

LESSON PLAN

Lect. No	Topic to be Covered	Weightage
1.	Product Promotion : Meaning and importance, Pricing, Promotional policies and practices. Market communication	10
2.	Planning : Planning in marketing managerial process, steps and strategic options. Product differentiation and product positioning	10
3.	Product Marketing : Market segmentation of consumer and industrial markets, selecting and promoting target markets.	10
4.	Product – Mix: meaning, classification, life cycle and components. Marketing channels- Meaning, Push and pull strategies. Promotion skills of wholesalers and retailers.	10
5.	Product Pricing: Definition, Price-mix, Pricing strategies and communicating prices. Psychology of human behaviour in product promotion-.	5
6	culture and sub-culture, value of consumer behaviour, social group. Organizational buying, message – source, structure, varieties and contents etc.	10
7.	Advertising : History, definition, classification, function and organization of advertising campaign. Elements, objectives and designing of advertising strategy and opportunities.	10
8	Measuring advertising performance. Sale promotion, planning objectives, techniques of consumer's promotion management.	5
9.	Sale force trade promotions and public relations, sales promotion effect.	10
10.	Product Selling : Personal selling, types, process and models. Managing sale force, personal selling and promotion mix, preliminary consideration in planning.	10
11.	Framework, strategies in international marketing, major players in international markets, promoting and international strategies.	10

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.

Practical No.	Name of practical	Weightage
1 & 2	To study the promotion skills of wholesalers	10
3 & 4	To study the promotion skill of Retailers	10
5 & 6 &7	To study the promotion strategies of food grains marketing company	20
8 & 9	To study the promotion strategies of fruits marketing company	15
10 & 11	To study the promotion strategies of milk & milk products marketing company	15
12 & 13	To study the promotion strategies of vegetables marketing company	15
14 & 15	To study the role of advertising in Agril. Sector.	15

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.

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Course No. : ABM- 3612
Title : Managerial Accounting
Credit : 2=1+1

THEORY

Finance- Concept, its relationship with other financial 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.

LESSON PLAN

Lect.	Name of the Topic	Weightage

No		
1.	Finance-Concept, its relationship with other financial areas	8
2.	Cash budgeting	6
3.	Proforma of income statement and balance sheet	6
4 & 5	Estimation and management of working capital	8
6	Inventory accounts	8
7 & 8	Capital budgeting, Cost of capital	10
9	Appraisal of applications for term loan	8
10& 11	Management for earning dividend determination of dividend and profit	10
12	Preparation of trial balance	6
13	Cost accounting-Relationship with financial accounting	6
14&15	Elements of cost, Preparation of cost sheet	8
16	Material cost-materials purchasing, receiving, storing, issuing including pricing of issues	6
17 & 18	Labour Cost-time keeping & time booking, idle time and labour turnover	10

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.

Practical No.	Name of practical	Weightage
1 & 2	To study balance sheet analysis	15
3 & 4	To study income statement and incremental income	15
4 & 5	To study the determination of dividend and profit.	15
6 & 7	A case study on term loan	10
8 & 9	To study inventory management	15
10 & 11	To study cost accountancy	10
12	Preparation of proforma of cost accounting	10
13 & 14	To study trial balance	10

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.
8.Dwivedi. D.N. Managerial Accounting.

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Course No. : ABM- 3613
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.

Practical No.	Name of practical	Weightage
1,2.	Study of price analysis	5
3,.	Study of importance of prices, trends, fluctuation of prices in agriculture and their impact.	5
4,5.	Study of price determination in agricultural products.	5
6.	Study of agricultural price policy in India	5
7.	Study of minimum support price	3
8.	Study of procurement price	3
9.	Study of administered price	3
10.	Study of statutory price	3
11.	Study of market price	3
12.	Study of market intervention price	3
13,14.	Study of procedure for determining MSP and trends in MSP over decade.	5

15.	Study of price parity	3
16,17.	Study of behaviour of agricultural prices, input factor prices in agriculture	5
18.	Study of vertical integration and horizontal integration	5
19,20.	Study of price discrimination	5
21.	Study of arrivals and prices of major farm products	5
22,23.	Study of trends in production.	3
24.	Study of effects of prices on area allocation in agriculture.	3
25.	Study of marketing research-definition, research objectives, process, objectives.	5
26,27.	Study of market research design	5
28.	Study of sources of data	3
29.	Study of data collection	5
30.	Study of data analysis	5
31.	Study of report and presentation	5
	Total	100

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.

Ramaswamy, V. S. and S. Namakumari. Marketing Management, Planning, Implementation and Control. MacMillan Co. 866, Third Avenue, New York – 10022