SECOND YEAR

Semester - III

Sr. No.	Course Name	Course No.	Credit	L	P	T
1	**Engineering Properties of Biological Materials and Food Quality**	**PFE - 201**	**3 (2 + 1)**	**2**	**1**	**0**

Course content :
Importance of engineering properties of biological materials, Study of different physical and thermal characteristics of important biological materials like shape, size, volume, density, roundness, sphericity, surface area, specific heat, thermal conductivity, thermal diffusivity, etc. measurement of colour, flavour, consistency, viscosity, texture and their relationship with food quality and composition. Rheological characteristics like stress, strain time effects, rheological models and their equations. Aerodynamic characteristics and frictional properties. Application of engineering properties in handling processing machines and storage structures. Concept, objectives and need of quality, quality control, methods of quality control, sampling; purpose, sampling techniques, requirements and sampling procedures for liquid, powdered and granular materials, sensory quality control, panel selection methods, interpretation of sensory results in statistical quality control, TQM and TQC, consumer preferences and acceptance, Food Laws and Regulations in India. Food grades and standards BIS, AGMARK, PFA, FPO, CAC (Codex Alimantarious Commission), sanitation in food industry , GMP, HACCP (Hazard analysis and critical control point) and ISO 9000 Series.

S.No.	Topics to be covered in Lecture	Proposed No. of Lecturess
	Planning of lectures	
1	Importance of engineering properties of biological materials.	2
2	Study of different physical and thermal characteristics of important biological materials like shape, size, volume, density, roundness, sphericity, surface area, specific heat, thermal conductivity, thermal diffusivity, etc.	4
3	Rheological characteristics like stress, strain time effects, rheological models and their equations.	3
4	Aerodynamic characteristics and frictional properties.	2
5	Application of engineering properties in handling processing machines and storage structures.	3
6	Concept, objectives and need of quality, quality control.	2
7	Measurement of colour, flavour, consistency, viscosity, texture and their relationship with food quality and composition.	3
8	Methods of quality control, sampling; purpose, sampling techniques, requirements and sampling procedures for liquid, powdered and granular materials.	3
9	Sensory quality control, panel selection methods, interpretation of sensory results in statistical quality control.	4
10	TQM and TQC, consumer preferences and acceptance.	3
11	Food Laws and Regulations in India. Food grades and standards BIS, AGMARK, PFA, FPO,	2

12	CAC (Codex Alimentations Commission). GMP, HACCP (Hazard analysis and critical control point) and ISO 9000 Series.	2
13	Sanitation in food industry.	1
	Total	**34**

Practicals		
S.No.	Topic	No. of Practicals
1	To find the shape and size of grains and fruits and vegetables.	1
2	To determine bulk density and angle of repose of grains	1
3	To determine the particle density/true density and porosity of solid grains.	1
4	To find out the co-efficient of external and internal friction of different crops.	1
5	To study the separating behaviour of a grain sample in a vertical wind tunner (Aspirator column).	1
6	To find the thermal conductivity of different grains	1
7	To determine specific heat of some food grains	1
8	To determine cooking quality of rice	1
9	To determine impurities and invisible stress cracks in grains	1
10	Preparation of a ready re-ckoner of change in unit weight of food grains as affected by change in its moisture content (w.b.) (5% - 25%).	1
11	Milling quality of paddy;	1
12	Determination of hardness of food material.	1
13	Detection of adulteration in food products viz. milk, ghee, honey etc.	1
	Total	**13**

Reference Books
- Physical properties of plant and animal materials. , By: Mohsenin, N. N.
- Physical properties of food, By: Hallstrom , B., Meffert, H. F. Th., Speiss, W. E.L. and G. Vos.
- Physical properties of foods -2, By: Jowitt, R. Escher, F., Kent, M., Mckenna, B. and M. Roqueas.
- Engineering properties of foods , By: Rao M. A. and SH Rizvi
- Mechanics of agricultural materials. , By: Sitkej. G.
- Physical Properties of foods and food processing systems, By: Lewis, M.J.
- Thermal Properties of Food and Agricultural Materials., By: Mohenin, Nuri N. (1980).

Sr. No.	Course Name	Course No.	Credit	L	P	T
2	Soil Mechanics	SWE-201	3 (2+1)	2	1	0

Course content :

Introduction of soil mechanics, field of soil mechanics, phase diagram physical and index properties of soil classification of soils, general classification based on particles size, textural classification and I.S. soil classification system stress condition in soils, effective and neutral stress, elementary concept of Bousinesque and Wester guards analysis, newmark influence chart. Shear strength mohr stress circle, theoretical relationship between principle stress circle, theoretical relationship between principal stress mohr-coulomb failure theory, effective stress principle. Determination of shear perameters by direct shear to be circle, theoretical test. Numerical exercise based on various types of tests. Compaction composition of soils standard and modified protector test, abbot compaction and Jodhpur mini compaction text field compaction method and control. Consolidation of soil: Consolidation of soils, one dimensional consolidation spring analogy, Terzaghi' s theory Laboratory consolidation text, calculation of void ratio and coefficient of volume change, Taylor' s and Casagrand' s method, determination of coefficient of consolidation. Earth pressure: Plastic equilibrium in soils, active and passive states, Rankine' s theory of earth pressure active and passive earth pressure for cohesive soils, simple numerical exercise. Stability of slopes: Introduction to stability analysis of infinite and finite slopes friction circles method Taylor' s stability number.

	Planning of lectures	
S.No.	Topics to be covered in Lecture	Proposed No. of Lectures
1	Introduction of soil mechanics, field of soil mechanics.	1
2	Phase diagram physical and index properties of soil.	2
3	Classification of soils, general classification based on particles size, textural classification and I. S. Soil classification system.	3
4	Stress condition in soils, effective and neutral stress.	2
5	Elementary concept of Bousinesque and Wester guards analysis, Newmark influence chart.	2
6	Shear strength Mohr stress circle, theoretical relationship between principle stress circle, theoretical relationship between principal stress	3
7	Mohr-coulomb failure theory, effective stress principle.	2
8	Determination of shear parameters by direct shear to the circle, theoretical test, numerical exercise based on various types of tests.	3
9	Compaction composition of soils standard and modified protector test Abbot Compaction and Jodhpur mini compaction text field compaction method and control.	3
10	Consolidation of soil Consolidation of soils, one dimensional consolidation spring analogy.	2
11	Terzaghi's theory Laboratory consolidation test, calculation of void ratio and coefficient of volume change,	2
12	Taylor's and Casagrande's method, determination of coefficient of consolidation.	2
13	Earth pressure Plastic equilibrium in soils, active and passive states, Rankine's theory of earth pressure active and passive earth pressure for cohesive soils, simple numerical exercise.	4

14	Stability of slopes Introduction to stability analysis of infinite and finite slopes friction circles method Taylor's stability number.	3
	Total	**34**

	Practicals	
S.No.	Topic	No. of Practicals
1	Determination of water content of soil. (Various methods)	2
2	Determination of specific gravity of soil.	1
3	Determination of field density of soil by core cutter method.	1
4	Determination of field density by sand replacement method.	1
5	Grain size analysis by sieving (Dry sieve analysis)	1
6	Grain size analysis by hydrometer method.	1
7	Determination of liquid limit by Casagrande's method.	1
8	Determination of liquid limit by cone penetrometer and plastic limit.	1
9	Determination of shrinkage limit.	1
10	Determination of permeability by constant head method.	1
11	Determination of permeability by variable head method.	1
12	Determination of compaction properties by standard proctor test.	1
13	Determination of shear parameters by direct shear test.	1
14	Determination of unconfined compressive strength of soil.	1
15	Determination of shear parameters by Tri-axial test.	1
16	Determination of consolidation properties of soils.	1
	Total	**17**

Reference Books
- Soil Mechanics and Foundation Engineering , By: B. C. Punmia,
- Soil Mechanics and Foundation Engineering , By: K.R. Arora,
- Soil Mechanics and Foundation Engineering , By: V. N. S. Murthy

Sr. No.	Course Name	Course No.	Credit	L	P	T
3	**Fluid Mechanics**	**SWE - 203**	**3 (2 + 1)**	**2**	**1**	**0**

Course content :
Properties of fluids Ideal and real fluid. Pressure and its measurement, Pascal's law, pressure forces on plane and curved surfaces, centre of pressure, buoyancy, metacentre and metacentric height, condition of floatation and stability of submerged and floating bodies; Kinematics of fluid flow Lagrangian and Eulerian description of fluid motion, continuity equation, path lines, streak lines and stream lines, stream function, velocity potential and flow net. Types of fluid flow, translation, rotation, circulation and vorticity, Vortex motion; Dynamics of fluid flow, Bernoulli's theorem, venturimeter, orifice-meter and nozzle, siphon; Laminar flow Stress-strain relationships, flow between infinite parallel plates - both plates fixed, one plate moving, discharge, average velocity, shear stress and pressure gradient; Laminar and turbulent flow in pipes, general equation for head loss-Darcy equation, Moody's diagram, Minor and major hydraulic losses through pipes and fittings, flow through network of pipes, hydraulic gradient and energy gradient, power transmission through pipe; Dimensional analysis and similitude Raleigh's method and Buckingham's Pi theorem, types of similarities, dimensional analysis, dimensionless numbers. Introduction to fluid machinery.

	Planning of lectures	
S.No.	Topics to be covered in Lecture	Proposed No. of Lectures
1	Properties of fluids.	3
2	Ideal and real fluid	1
3	Pressure and its measurement	3
4	Pascal's law	1
5	Pressure forces on plane and curved surfaces	2
6	Centre of pressure	1
7	Buoyancy, Metacentre and Metacentric height, Condition of floatation and stability of submerged and floating bodies	2
8	Kinematics of fluid flow Lagrangian and Eulerian description of fluid motion, continuity equation, path lines, streak lines and stream lines, stream function, Velocity potential and flow net,	3
9	Types of fluid flow	1
10	Translation, rotation	1
11	Circulation and vorticity, Vortex motion	1
12	Dynamics of fluid flow, Bernoulli's theorem,	2
13	Venturimeter, orifice-meter and nozzle, siphon	1
14	Laminar flow Stress-strain relationships, flow between infinite parallel plates - both plates fixed, one plate moving, Discharge, average velocity, Shear stress and pressure gradient	2
15	Laminar and turbulent flow in pipes	2
16	General equation for head loss-Darcy Equation	1
17	Moody's diagram	1
18	Minor and major hydraulic losses through pipes and fittings	1
19	Flow through network of pipes	1

20	Hydraulic gradient and energy gradient, power transmission through pipe	1
21	Dimensional analysis and similitude Rayleigh's method and Buckingham's 'Pi' theorem, Types of similarities, dimensional analysis, dimensionless numbers	2
22	Introduction to fluid machinery.	1
	Total	**34**

Practicals		
S.No.	Topic	No. of Practicals
1	Study of manometers and pressure gauges.	1
2	Verification of Bernoulli's theorem.	1
3	Determination of coefficient of discharge of venturi meter	1
4	Determination of coefficient of discharge of orifice meter	1
5	Determination of coefficient of friction in pipeline.	1
6	Determination of coefficient of discharge for rectangular notch.	1
7	Determination of coefficient of discharge for triangular notch.	1
8	Determination of coefficient of discharge, coefficient of velocity and coefficient of contraction for flow through orifice.	1
9	Determination of coefficient of discharge for mouth piece	1
10	Measurement of force exerted by water-jets on flat and hemispherical vanes	1
11	Determination of meta centric height	1
12	Determination of efficiency of hydraulic ram	1
13	Performance evaluation of Pelton turbine	1
14	Performance evaluation of Francis turbine	1
15	Study of current meter velocity distribution in open channels	1
16	Determination of Manning's coefficient of rugosity	1
	Total	**17**

Reference Books
- Hydraulics and Fluid Mechanics , By: Modi & Sheth,
- Fluid Mechanics , By: V. L. Streeter
- Engineering Fluid Mechanics , By: D. S. Kumar,
- Fluid Mechanics and Hydraulic Machines , By: Dr. R K. Bansal,
- Hydraulics and Fluid Mechanics, By: Dr Jagdishlal,
- Engineering Fluid Mechanics , By: K. L. Kumar,
- Hydraulics and Fluid Mechanics, By: S Khurmi ,

Sr. No.	Course Name	Course No.	Credit	L	P	T
4	**Farm Machinery and Equipment - I**	**FMP - 201**	**3 (2 + 1)**	**2**	**1**	**0**

Course content:
Objectives of farm mechanization. Classification of farm machines. Materials of construction & heat treatment. Principles of operation and selection of machines used for production of crops. Field capacities & economics. Tillage; primary and secondary tillage equipment. Forces acting on tillage tools. Hitching systems and controls. Draft measurement of tillage equipment   Earth moving equipment - their construction & working principles viz Bulldozer, Trencher, Elevators etc.; sowing, planting & transplanting equipment - their calibration and adjustments. Fertilizer application equipment. Weed control and Plant protection equipment - sprayers and dusters, their calibration, selection, constructional features of different components and adjustments.

Planning of lectures

S.No.	Topics to be covered in Lecture	Proposed No. of Lectures
1	Mechanization	2
2	Classification of farm machineries, materials of construction	2
3	Principles of operation and selection of machines used for production of crops	2
4	Field capacities and economics	2
5	Tillage, primary and secondary tillage equipments	6
6	Forces acting on tillage tools	2
7	Hitching systems and controls, draft measurement of tillage equipment	3
8	Earth moving equipment- their construction and working principles viz. bulldozer, trencher, elevator etc.	4
9	Sowing, planting and transplanting equipment – their calibration and adjustments, fertilizer application equipment	4
10	Weed control and plant protection equipment, sprayers and dusters, their calibration, selection, constructional features of different components and adjustments, test codes and their related uses	3
	Total	**30**

Practicals

S.No.	Topic	No. of Practicals
1	Introduction to various machines and implement available in lab.	1
2	Measurement of field capacity and field efficiency of M.B. plough	1
3	Measurement of field capacity and field efficiency of disc harrow	1
4	Measurement of draft and fuel consumption of agricultural implements	1
5	Constructional details, adjustment and working of M.B. Plough	1
6	Constructional details, adjustment and working of Disc Plough	1
7	Constructional details, adjustment and working of secondary tillage tools	1
8	Constructional details, adjustment and working of earth moving equipment	1

9	Constructional details, adjustment and working of rotavator and rotary tillers	1
10	Constructional details, adjustment and working of seed cum fertilizer drills / planter	1
11	Calibration of seed drill	1
12	Working of weeding equipment	1
13	Working of sprayer for nozzle discharge and field capacity	1
14	Working of duster	1
15	Working of transplanter	1
	Total	**15**

Reference Books

- Principle of farm machinery , By: R.A. Kepner, Roy Bainer & E.L. Berger
- Farm machines & equipments , By: C. P. Nakra
- Agricultural Engg. (through worked examples) , By: R. Lal and A.C. Datta
- Farm machine , By: Claude Cuplin
- Elements of Agril. Engg. , By: J. Sahay
- Elements of farm machinery , By: A.C. Srivastava
- Farm Machinery & Equipment, By: H.P. Smith & L.H. Wilkey
- Principles of Agricultural Engineering,   , By: A.M. Michael & T.P. Ojha,
- Farm Machinery, By: Claude Culpin Granada,
- Elements of Farm Machinery, By: A.C. Srivastava,
- Agricultural Machines, , By: N.I. Kelnin, I.F.Popov,   A.V.A. Sakur

Sr. No.	Course Name	Course No.	Credit	L	P	T
5	**Farm Power**	**FMP - 203**	**3 (2 + 1)**	**2**	**1**	**0**

Course content :

Sources of farm power -conventional & non-conventional energy sources. Classification of tractors and IC engines. Review of thermodynamic principles of IC (CI & SI) engines and deviation from ideal cycle. Study of engine components their construction, operating principles and functions. Engine systems valves & valve mechanism. Fuel & air supply, cooling, lubricating, ignition, starting and electrical systems. Study of constructional details, adjustments & operating principles of these systems. IC engine fuels - their properties & combustion of fuels, gasoline tests and their significance, diesel fuel tests and their significance, detonation and knocking in IC engines, study of properties of coolants, anti freeze and anti-corrosion materials, lubricant types & study of their properties. Engine governing systems.

	Planning of lectures	
S.No.	Topics to be covered in Lecture	Proposed No. of Lectures
1	Conventional and non conventional sources of farm power	3
2	Classification of IC engines and tractors	3
3	Review of thermodynamic principles of IC engine and deviation from ideal cycles	3
4	Study of engine components, their construction, operating principles and functions	3
5	Engine system- valve and valve mechanism	2
6	Engine system- fuel and air supply	2
7	Engine system – Cooling and lubricating system	2
8	Engine system – ignition, starting and electrical system	2
9	IC engine, fuels, their properties, combustion of fuels	2
10	Gasoline tests and their significance	1
11	Diesel fuel test and their significance	2
12	Detonation and knocking of IC engines	2
13	Coolant properties, anti freeze, anti corrosion materials	2
14	Lubricant types and their properties	1
15	Governor system of engines	2
	Total	**32**

	Practicals	
S.No.	Topic	No. of Practicals
1	Study on conventional and non conventional sources	1
2	Study of different types of engines and tractors	2
3	Acquaintance with engine components, their construction, operating principles and functions	1
4	Study on valve and valve mechanism	1
5	Assembly and dismantling of fuel and air supply system	2
6	Study on cooling system	1
7	Study on lubricating system	1

8	Study on electrical system (Ignition and lighting)	1
9	Study of fuel properties of different fuels	1
10	Testing of fuels (gasoline) and their significance	1
11	Testing of fuels (diesel) and their significance	1
12	Study on lubricants and their properties	1
13	Study on governor system of engines	1
	Total	**15**

Reference Books
- Elements of Agril. Engg. By: J. Sahay
- Tractors & their power untis , By: J.B. Liljedahl, P.K. Turnquist, D.W. Smith, Makota Hoki
- Farm machines & equipment, By: C.P. Nakra

Sr. No.	Course Name	Course No.	Credit	L	P	T
6	**Watershed Hydrology**	**SWE - 205**	**3 (2 + 1)**	**2**	**1**	**0**

Course content :

Introduction; hydrologic cycle; precipitation - forms, rainfall measurement, mass curve, hydrograph, mean rainfall depth, frequency analysis of point rainfall, plotting position, estimation of missing data, test for consistency of rainfall records; interception; infiltration; evaporation; evapo-transpiration - estimation and measurement; geomorphology of watersheds - stream number, stream length, stream area, stream slope and Horton' s laws; runoff - factors affecting, measurement; stage and velocity, rating curve, extension of rating curve; estimation of peak runoff rate and volume; rational method, Cook' s method, SCS method, Curve number method; hydrograph; components, base flow separation, unit hydrograph theory - unit hydrograph of different durations, dimensionless unit hydrograph, distribution hydrograph, synthetic unit hydrograph, uses and limitations of unit hydrograph; head water flood control - methods, retards and their location; flood routing - graphical methods of reservoir flood routing; hydrology of dry land areas - drought and its classification; introduction to watershed management and planning.

	Planning of lectures	
S.No.	Topics to be covered in Lecture	Proposed No. of Lectures
1	Introduction; hydrologic cycle; precipitation - forms	1
2	Rainfall measurement, hyetograph	2
3	Mass curve, mean rainfall depth	1
4	Frequency analysis of point rainfall, plotting position.	3
5	Estimation of missing data, test for consistency of rainfall records	1
6	Interception; infiltration; evaporation, evapotranspiration, transpiration, its estimation and measurement	3
7	Geomorphology of watersheds - stream number, stream length, stream area, stream slope) and Holton's laws	2
8	Runoff - factors affecting, measurement; stage and velocity, rating curve, extension of rating curve	3
9	Estimation of peak runoff rate and volume; rational method, Cook's method, SCS method, Curve number method	3
10	Hydrograph; components, base flow separation	2
11	Unit hydrograph theory - unit hydrograph of different durations	2
12	Dimensionless unit hydrograph, distribution hydrograph	1
13	Synthetic unit hydrograph	1
14	Uses and limitations of unit hydrograph	1
15	Head water flood control – methods	1
16	Retards and their location	1
17	Flood routing – graphical methods of reservoir, flood routing	2
18	Hydrology of dry land areas - drought and its classification	2
19	Introduction to watershed management and planning	2
	Total	**34**
	Practicals	
S.No.	Topic	No. of

		Practicals
1	Visit to meteorological observatory	1
2	Study of different types of rain gauges	1
3	Exercise on analysis of rainfall data	1
4	Double mass curve technique	1
5	Determination of average depth of rainfall and frequency analysis	2
6	Study of stage recorders and current meters	1
7	Exercise on estimation of peak runoff rate and runoff volume	3
8	Exercises on hydrograph and unit hydrograph	3
9	Exercises on design and location of retards for channel improvement	1
10	Exercises on flood routing problems	2
11	Visit to watershed	1
	Total	**17**

Reference Books
- Hand Book of applied Hydrology, By: L R
- Water Shed Hydrology, By: R Suresh
- Hydrology, By: H M Raghunath
- Daryaganj, New Delhi-110002
- Statistical methods in Hydrology, By: C T Haan,
- Land and water management; Principles and Practices, By: V V N Murthy
- Principles of Hydrology, By: K Subramaniyam,

Sr. No.	Course Name	Course No.	Credit	L	P	T
7	**Engineering Mathematics-III**	**Maths (E)-201**	**3 (2 + 1)**	**2**	**0**	**1**

Course content :
Numerical analysis
Finite differences, various difference operators and their relationships, factorial notation, interpolation with equal intervals, Newton's forward and backward interpolation formulae, Bessel's and Stirling's central difference interpolation formulae, interpolation with unequal intervals, Newton's divided difference formula, Lagrange's interpolation formula; numerical differentiation, differentiation based on equal interval interpolation, first and second order derivatives by using Newton's forward and backward, Stirling's and Bessel's formulae; maxima and minima of a tabulated function, numerical integration, numerical integration by Trapezoidal, Simpson's and Weddle's rules; Difference equations, order of a difference equation, solution of linear difference equation, rules for finding complimentary function and particular integral; numerical solution of ordinary differential equations by Picard's method, Taylor's series method, Euler's method, modified Euler's method, Runge-Kutta method.
Laplace transforms: Definition of Laplace transform, Laplace transforms of elementary functions, properties of Laplace transforms, inverse Laplace transforms, transforms of derivatives, integrals, transform of function multiplied by t^n, transform of function divided by t, convolution theorem; application of Laplace transforms to solve ordinary differential equations and simultaneous differential equations, Laplace transforms of unit step function, unit impulse function, periodic function.

Planning of lectures		
S.No.	Topics to be covered in Lecture / Tutorial	Proposed No. of Lectures/ Tutorials
1	Numerical analysis: Finite differences ,various differential operators and their relationships, factorial notation	3
2	Interpolation with equal intervals: Newton's forward interpolation ,Newton's backward interpolation	5
3	Central difference interpolation: Bessel's interpolation, Stirling's interpolation	3
4	Interpolation with unequal intervals: Lagrange's interpolation, Newton's divided difference interpolation	4
5	Numerical differentiation: Differentiation based on equal interval interpolation formulae like Newton's forward interpolation formula, Newton's backward interpolation formula, Bessel's interpolation formula, Stirling's interpolation formula(calculate first and second derivative),Maxima-minima of tabulated functions	2
6	Numerical integration: Trapezoidal rule, Simpson's rule, Weddle's rule	3
7	Difference equation: Linear difference equation, rules for finding C.F. and P.I.	6
8	Numerical solution of ordinary differential equation: Picard's method, Taylor's method, Euler's method, Modified Euler's method, Runge-Kutta method	4
9	Laplace transform: Laplace transform of elementary functions, properties of laplace transform, inverse laplace transform	4
10	Laplace transform of derivatives, integrals, function multiplied by t^n, function divided by t	2
11	Convolution theorem and problems	3
12	Application of Laplace transform to solve ordinary differential equations	4

13	Applications of Laplace transform to solve simultaneous differential equations	2
14	Laplace transform of unit step function, unit impulse function, periodic function	3
	Total	**48**

Reference Books
- Higher engineering mathematics Vol-II , By: Dr. K R Kachot
- Numerical methods in Engineering and science , By: Dr. B S. Grewal
- A text book of engineering mathematics , By: N P Bali and Ashok Saxena
- Numerical mathematical analysis , By: James B Scarborough
- Introductory methods of Numerical analysis , By: S S Sastry
- Numerical Analysis, By: Dr. B S Goel and Dr S K Mittal
- Advanced Engineering Mathematics , By: Erwin Kreyszing

Sr. No.	Course Name	Course No.	Credit	L	P	T
8	Agribusiness Management and Trade	Eco (E)- 201	3 (3 + 0)	3	0	0

Course content :
Management concepts and principles, process of management, functions of management, concept of agribusiness and application of management principles to agribusiness, production, consumption, and marketing of agricultural products, agricultural processing, meaning and theories of international trade, WTO provisions for trade in agricultural and food commodities, India's contribution to international trade in food and agri - commodities

	Planning of lectures	
S.No.	Topics to be covered in Lecture	Proposed No. of Lectures
1	Management concepts and principles	5
2	Process of management	4
3	Functions of management	5
4	Concept of agribusiness and application of management principles to Agribusiness	7
5	Production, consumption, and marketing of agricultural products	7
6	Agricultural processing, meaning and theories of international trade	5
7	WTO provisions for trade in agricultural and food commodities	7
8	India's contribution to international trade in food and agri - commodities	5
	Total	45

Reference Books
- Agri-Business Management, By: W. David Downey and Steven P. Erickson
- Introduction to Agri-Business Management, By:Davis J. and Eddberg
- Essential of Management , By:Harald Koontz and Heinz Weshrich
- Organizational Behaviour: Texts and Causes, By:R. K. Puri and Sanjeev Verma
- Introduction to   Management Accounting, By: Harngren, Swaden and , Stratten