

B.Sc(Ag)Course Curriculum

FOR COURSE OUTLINE B.Sc. (Ag) FIRST YEAR COURSES (REVISED CURRICULUM) 2007

FIRST YEAR

Course No	Title of the Course	Credit Hours (T+P)
First Semester		
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AGRO 101	Principles of Agronomy and Agricultural Meteorology	3(2+1)
GPBR- 111	Principles of Genetics	3(2+1)
SSAC- 121	Introduction to Soil Science	3(2+1)
ENTO 131	Insect Morphology and Systematics	3(2+1)
AECO 141	Principles of Agricultural Economics	2(2+0)
PATH- 171	Introduction to Plant Pathogens	3(2+1)
HORT 181	Principles of Horticulture and Production Technology of Fruit Crops	3(2+1)
Total:		20(14+6)
Course No	Title of the Course	Credit Hours (T+P)
Second Semester		
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BICM 101	Biochemistry	3(2+1)
ENGL 101	Comprehension and Communication Skills in English	2(1+1)
STCA 101	Statistics	2(1+1)
AGRO 102	Dryland Farming and Watershed Management	2(1+1)
AECO 142	Agricultural Finance and Cooperation	2(1+1)
AENG 151	Fundamentals of Soil and Water Conservation Engineering	3(2+1)
PPHY 161	Crop Physiology	3(2+1)
AEXT 191	Dimensions of Agricultural Extension	2(1+1)
COCA 100	Physical Education	1(0+1)
Total:		20(11+9)

First Semester

1.	Course No.:	AGRO 101
2.	Course Title	PRINCIPLES OF AGRONOMY AND AGRICULTURAL METEOROLOGY
3.	Credit Hours	3 (2+1)
4.	Semester	First Semester
5.	Academic level of	Intermediate with EAMCET Rank

Entry	
6. General Objective	To make the students understand the Principles of Agronomy and Agricultural Meteorology
7. Specific objectives:	-

A.Theory:

By the end of the course the students will be able to:

- i) Explain the concepts of Agronomy and Agricultural Meteorology.
- ii) Describe the situation of Agriculture in various agro climatic zones of India and A.P.
- iii) Distinguish between weather and climate and discuss the roles of the Factors affecting these phenomena in crop production.
- ix) Discuss the risk and uncertainties and ways to manage the same for Better crop production.

B.Practical:

By the end of the practical exercises, the students will be able to:

- i) Identify different manures, fertilizers, green manure plants etc.
- ii) Participate in all agricultural operations like ploughing, puddling, sowing, application of fertilizers, harvesting etc.
- iii) Measure the weather elements in crops and atmosphere and distinguish their role in crop production.
- ix) Read and analyze the weather data and synoptic phenomena for use in crop Management.

AGRO 101 PRINCIPLES OF AGRONOMY AND AGRICULTURAL METEOROLOGY

THEORY

Sl. No.	Lesson	Time required(Hrs)	Teaching Methods to be used	Teaching Aid to be used	Ref.
1&2.	Meaning and scope of Agronomy History of Agriculture - Development Ancient India - Agriculture in Civilization Era.	1	Interactive Lecture	Chalk Board & Strip transparency	1&2
3.	National and International Agricultural Research Institutes in India.	1	Interactive Lecture	Chalk Board & Picture transparency	1 & 2
4.	Agro-climatic zones of India and Andhra Pradesh Soils, land use pattern, major sources of irrigation, ground water potential.	1	Interactive Lecture	Chalk Board & Picture transfer transparency	1 & 2

5.	Tillage and Tilt Objectives of tillage, characteristics of ideal seed bed, effect of tillage on soil properties (Pore space, texture, structure, bulk Density, colour of the soil).	1	Interactive Lecture	Chalk Board & Strip transparency	1 & 2
6.	Types of tillage Preparatory tillage, factors affecting preparatory cultivation, after cultivation and puddling.	1	Interactive Lecture	Chalk Board & Over lay transparency	1 & 2
7.	Sowing methods of sowing, time and depth of sowing for major agricultural crops.	1	Interactive Lecture	Chalk Board & Over lay transparency	1 & 2
8.	Crop stand establishment factors affecting optimum stand establishment.	1	Interactive Lecture	Chalk Board & Strip transparency	1 & 2
9.	Planting geometry Competition types of competition, Intra and Inter plant competition, Plant population Effect on plant population on growth and yield. Optimum plant density and planting pattern.	1	Interactive Lecture	Chalk Board Picture transfer transparency	1 & 2
10.	Soil fertility Soil fertility and Soil productivity, fertility losses, maintenance of soil fertility, soil organic matter.	1	Interactive Lecture	Chalk Board & Window transparency	1 & 2
11 & 12.	Weed control Definition of weed Losses and uses of weeds Weed influence on crop production Principles of crop weed competition, critical periods for weed control in different crops, methods of weed control and principles in weed management and IWM.	1	Interactive Lecture	Chalk Board & Strip transparency	1 & 2
13 & 14.	Irrigation management Importance of irrigation, objectives of irrigation Methods of irrigation Causes of ill drainage, effects of ill drained conditions on crops, advantages of drainage.	1	Interactive Lecture	Chalk Board, Over lay & Strip transparency	1 & 2
15.	Cropping systems Monocropping and its disadvantages Definition and principles of crop rotation, mixed cropping, intercropping relay cropping, multistoried cropping, sole cropping and sequence cropping.	1	Interactive Lecture	Chalk Board, Window & Strip transparency	1 & 2
16.	Harvesting and Post-harvest technology for major agricultural crops rice, maize, groundnut and sugarcane).	1	Interactive Lecture	Chalk Board & Picture transparency	1 & 2
17.	Introduction - Definitions of meteorology, climatology, agricultural meteorology -	1	Interactive Lecture	Chalk Board, Pull & Rotating	3 & 4

	Scope and practical utility of agricultural meteorology.			transparency	
18.	Composition and structure of atmosphere, Definitions of weather and climate, aspects involved in weather and climate.	1	Interactive Lecture	Chalk Board, Picture & Window transparency	3 & 4
19.	Solar radiation Definition, introduction of electromagnetic spectrum and functions of light, solar constant, net radiation, black body radiation, emissivity, absorptivity, reflectivity, transmissivity and albedo.	1	Interactive Lecture	Chalk Board, Picture & Overlay transparency	3 & 4
20.	Physiological response of different bands of incident radiation; factors affecting the distribution of solar radiation within the plant canopy.	1	Interactive Lecture	Chalk Board, Pull & Window transparency	3 & 4
21.	Atmospheric temperature Introduction, Temperature and heat definitions, isotherms, horizontal and vertical temperature variations in the atmosphere Cardinal temperatures, air temperature and crop production and its importance on plant life.	1	Interactive Lecture	Chalk Board, Pull & Overlay transparency	3 & 4
22.	Low air temperature and plant injury; high air temperature and plant injury. Soil temperature Factors affecting soil temperature.	1	Interactive Lecture	Chalk Board, Pull & Rotating transparency	3 & 4
23.	Definitions of Atmospheric pressure, cyclones and anticyclones - Wind definition, Effects of wind on crops Land and Sea breezes Mountain and Valley winds.	1	Interactive Lecture	Chalk Board, Picture & Pull transparency	3 & 4
24.	Atmospheric humidity and its expression; saturation; Effects of humidity on crops.	1	Interactive Lecture	Chalk Board, Picture & Overlay transparency	3 & 4
25.	Evaporation and transpiration definitions - Factors affecting rate of evaporation and transpiration.	1	Interactive Lecture	Chalk Board, Pull & Window transparency	3 & 4
26.	Monsoons Definition, origin of South West and North East Monsoons and their occurrence. Their impact on agricultural operations during different cropping seasons.	1	Interactive Lecture	Chalk Board, Picture & Pull transparency	3 & 4
27.	Rainfall Types of rainfall - Clouds, classification of clouds and the characteristics of different forms of clouds.	1	Interactive Lecture	Chalk Board, Pull & Window transparency	3 & 4
28.	Drought definition Types of drought Effect of	1	Interactive	Chalk Board,	3 &

	drought on crops management of drought		Lecture	Pull & Rotating transparency	4
29.	Precipitation and condensation definition, Different forms of precipitations and condensations Artificial rainmaking.	1	Interactive Lecture	Chalk Board, Window & Pull transparency	3 & 4
30.	Weather disasters and management Rainfall, heat and cold waves, wind, storms, hail storms, thunderstorms and dust storms, Tornadoes, defective insolation.	1	Interactive Lecture	Chalk Board, Pull & Overlay transparency	3 & 4
31.	Weather forecasting Applications and utility for agriculture Synoptic charts, reports and symbols.	1	Interactive Lecture	Chalk Board, Pull & Picture transparency	3 & 4
32.	Remote sensing definition, introduction, application in agriculture Microclimate.	1	Interactive Lecture	Chalk Board, Pull & Overlay transparency	3 & 4

PRACTICALS

Sl. No	Practical	Time required(Hrs)	Teaching Method to be employed	Ref.
1.	Study of tillage implements	2	Field exercise	Practical Manual
2.	Practice of ploughing	2	Field exercise	Practical Manual
3.	Practice of puddling	2	Lab exercise	Practical Manual
4.	Study of seeding equipment Different methods of sowing	2	Models, laminations & farm implements	Practical Manual
5.	Study of manures, fertilizers and green manure crops/seeds.	2	Field exercise	Practical Manual
6.	Study of inter cultivation implements and practice	2	Field exercise	Practical Manual
7.	Practice of methods of fertilizer application	2	Visit to CRIDA & ICRISAT farm	Practical Manual
8.	Participation in ongoing field operations	2	Field exercise	Practical Manual
9.	Visit to IMD meteorological observatory Layout plan of standard meteorological observatory	2	Field visit	Practical Manual
10.	Measurement of light intensity/radiation components	2	Measurement in field crops	Practical Manual
11.	Recording of atmospheric and soil temperature	2	-do-	Practical Manual
12.	Recording of relative humidity	2	-do-	Practical Manual
13.	Measurement of wind speed, direction and	2	-do-	Practical

	measurement of atmospheric pressure			Manual
14.	Recording of evaporation	2	-do-	Practical Manual
15.	Measurement of rainfall different types of rain gauges	2	-do-	Practical Manual
16.	Synoptic charts and weather reports, symbols etc.	2	-do-	Practical Manual

EVALUATION

THEORY		
Mid semester examination	50 Marks	Reduced to 40 Marks
Semester final theory examination	100 Marks	Reduced to 60 Marks
	TOTAL 150 Marks	Reduced to 100 Marks
PRACTICAL		
Classwork & Record		25 Marks
Semester final practical examination		25 Marks
TOTAL		50 Marks

REFERENCES

1.	Principles of Agronomy	Yellamanda Reddy T and Sankara Reddy G H 1995. Kalyani Publishers, Ludhiana
2.	Principles of Agronomy,	Sankaran S and Mudaliar V S 1995. The Banagalore Printing and Publishing Co. Ltd., Bangalore
3.	Basic Principles of Agricultural Meteorology	Radha Krishna Murthy V 2002. B.S. Publications, Hyderabad
4.	Terminology on Agrometeorology and Agronomy	Radha Krishna Murthy V, Yakadri M and Prasad P V V 2006. B.S. Publications, Hyderabad
1.	Course No.:	GPBR-111
2.	Course Title	PRINCIPLES OF GENETICS
3.	Credit Hours	3 (2+1)
4.	Semester	First Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To acquaint the students with the theory and principles of genetics applied in plant breeding for higher agriculture productivity.
7.	Specific objectives:	-

A.Theory:

By the end of the course the students will be able to:

- i) Discuss understand the basic concepts of cell, chromosomes and DNA.
- ii) Apply genetic principles for plant breeding

B.Practical:

By the end of the course the students will be able to

- i) Identify various stages of cell division, both mitosis and meiosis.
 ii) Apply chi-square test for fitness of the data
 iii) Explain different epistatic factors and also linkage maps will be constructed.

GPBR-111 PRINCIPLES OF GENETICS

THEORY

Sl. No.	Topic / Lesson	Time required(Hrs)	Teaching method	Teaching aid	Ref.
1.	Definitions of cytology, genetics, cytogenetics, plant breeding, inter-relationships among them and with other branches of science. History-historical development, cell theory and protoplasm theory	1	Interactive lecture	Chalk-board & Strip Transparency	1
2.	Cell and cell organelles A typical plant cell, cell wall, plasma membrane, cytoplasm, ER, GC, lysosome, microbodies, microtubules, microfilaments, ribosomes.	1	Interactive Lecture	Chalk -board & Window Transparency	5
3.	Mitochondria, plastids, nucleus	1	Interactive Lecture	Chalk -board & Window Transparency	5
4.	Chromosome morphology shape, size, number and structure, heterochromatin, euchromatin	1	Interactive Lecture	Chalk -board & Window Transparency	1
5.	Special types of chromosomes lamp brush chromosome, salivary gland chromosome, super numerary chromosome isochromosome and sex chromosome, karyotype and ideogram role of chromosomes in heredity.	1	Interactive Lecture	Chalk -board & Window Transparency	1
6.	Cell division cell cycle mitosis	1	Interactive Lecture	Chalk -board & Window Transparency	1
7.	Meiosis	1	Interactive Lecture	Chalk -board & Window Transparency	1
8.	DNA structure and function Watson and crick model, classification of DNA, proof that DNA is the genetic material Transformation, transduction, bacteriophage infection and biochemical evidences.	1	Interactive Lecture	Chalk -board & Window Transparency	1
9.	Modes of DNA replication semi conservative DNA replication experimental proof Generalized model for DNA replication. DNA repair definition methylation, restriction endonucleases, types of repair systems, renaturation and denaturation of DNA	1	Interactive Lecture	Chalk-board & Strip Transparency	1
10.	Structure of RNA mRNA, rRNA, tRNA Genetic code, wooble hypothesis, fine structure of a gene cistron, recombinant muton.	1	Interactive Lecture	Chalk-board & Window Transparency	1
11.	Central dogma of life protein synthesis transcription and translation	1	Interactive Lecture	Chalk-board & Strip Transparency	1
12.	Regulation of gene expression operon model (Jacod & Monad), important terms, regulation of gene expression in eukaryotes (Britten & Davidson model)	1	Interactive Lecture	Chalk-board & Strip Transparency	1
13.	Mendels experiment reasons for selection of pea as experimental material characters studied reasons for mendels success.	1	Interactive Lecture	Chalk-board & Strip Transparency	1

14.	Mendels I Law & Monohybrid ratio	1	Interactive Lecture	Chalk-board & Window Transparency	1
15.	II Law and dihybrid ratio exceptions to mendels law	1	Interactive Lecture	Chalk-board & Window Transparency	1
16.	Gene interaction types of epistasis	1	Interactive Lecture	Chalk-board & Strip Transparency	1
17.	Types of gene action dominance, over dominance, co-dominance, pleiotropism, multiple alleles, pseudoalleles, penetrance and expressivity	1	Interactive Lecture	Chalk-board & Strip Transparency	1
18.	Linkage coupling & repulsion, types of linkage, theories of linkage, significance of linkage in plant breeding, differences between linkage and pleiotropism.	1	Interactive Lecture	Chalk-board & Window Transparency	1
19.	Crossing over factors affecting crossing over, mechanism of crossing over, cytological proof of crossing over significance in plant breeding	1	Interactive Lecture	Chalk-board & Strip Transparency	1
20.	Chromosome mapping 2 point and 3 point test cross cytological and genetical maps	1	Interactive Lecture	Chalk-board & Strip Transparency	1
21.	Polygenes polygenic characters differences between mono and polygenic characters, multiple factor hypothesis and transgressive segregation.	1	Interactive Lecture	Chalk-board & Window Transparency	1
22.	Cytoplasmic inheritance classes of cytoplasmic inheritance characteristics, differences between chromosomal and extrachromosomal inheritance.	1	Interactive Lecture	Chalk-board Strip & Window Transparency	1
23.	Sex determination mechanisms sex abnormalities, barr bodies, sex reversal, significance of sex	1	Interactive Lecture	Chalk-board & Strip Transparency	1
24.	Sex linkage sex linked, limited, influenced characters, primary disjunction and secondary non-disjunction	1	Interactive Lecture	Chalk-board & Strip Transparency	1
25..	Characters of mutations physical and chemical mutagens - Induction of Mutations Detection of sex linked lethals in Drosophila (CLB method given by Muller) Detection of mutations in plants Importance of mutation in Plant Breeding programmes. Xenia and metaxenia - Molecular basis of mutations	1	Interactive Lecture	Chalk-board & Strip Transparency	1 & 2
26.	Structural Chromosomal aberrations Breakage - Fusion - Bridge cycle - Deletions (Deficiency), duplications and their significance in Plant Breeding.	1	Interactive Lecture	Chalk-board, Strip & Window Transparency	1 & 2
27.	Inversions Pericentric Inversions and paracentric inversions Inversions as cross over suppressors Translocations Simple and reciprocal Pairing pattern Their role in Plant Breeding	1	Interactive Lecture	Chalk-board, Strip & Window Transparency	1 & 2
28.	Numerical chromosomal aberrations Terminology - Classification Euploidy - Aneuploidy Autopolyploids Segmental polyploids	1	Interactive Lecture	Chalk-board & Strip Transparency	1 & 2
29.	Haploids Triploids Tetraploids - Cytological behaviour and their significance in plant breeding	1	Interactive Lecture	Chalk-board, Strip & Window Transparency	1 & 2
30.	Aneuploidy Type of aneuploids - Their cytological behaviour and their significance in plant breeding.	1	Interactive lecture	Chalk-board, Strip & Window Transparency	1 & 2
31.	Evolution of crop species (Eg. Wheat, cotton, <i>Triticale</i> , <i>Brassica</i> , tobacco etc.)	1	Interactive lecture	Chalk-board, Strip & Window	1 & 2

				Transparency	
32.	Genomics : definition structural genomics, functional genomics, brief description of genome of arabidopsis, rice, maize human genome project.	1	Interactive lecture	Chalk-board, Strip & Window Transparency	4

PRACTICALS

Sl. No	Topic / Lesson	Time required(Hrs)	Teaching method	Teaching aid	Ref.
1.	Microscopy	2	Lab exercise	Microscopes	7
2.	Cytological techniques	2	Lab exercise	Different types of stains	2,6
3.	Mitosis	2	Lab exercise	Slide preparation	2,6
4.	Meiosis	2	Lab exercise	Slide preparation	2,6
5.	Monohybrid ratio and its modification	2	Lab exercise	Material	1,2
6.	Dihybrid ratios and modification	2	Lab exercise	Window transparency / Chalk board	1,2
7.	Chi-square analysis	2	Lab exercise	Chalk board / Window transparency	1,2
8.	Interaction of factors	2	Lab exercise	Chalk board / Window transparency	1,2
9.	Epistasis and supplementary factors	2	Lab exercise	Tutorials / Material / Chalk board / Window transparency	1,2
10.	Duplicate and complementary factor	2	Lab exercise	Chalk board / Window transparency	1,2
11.	Additive and inhibitory factors	2	Lab exercise	Chalk board / Window transparency	1,2
12.	Linkage 2 point test cross	2	Lab exercise	Chalk board / Window transparency	1,2
13.	Linkage 3 point test cross	2	Lab exercise	Chalk board / Window transparency	1,2
14.	Induction of polyploidy using colchicine	2	Lab exercise	Field visit	2,6
15.	Induction of chromosomal aberration	2	Lab exercise	Strip transparency	7
16.	Practical exam	2	-	-	-

EVALUATION

THEORY		
Mid semester examination	50 Marks	Reduced to 40 Marks
Semester final theory examination	100 Marks	Reduced to 60 Marks
TOTAL	150 Marks	Reduced to 100 Marks
PRACTICAL		
Classwork & Record		25 Marks
Semester final practical examination		25 Marks
TOTAL		50 Marks

Total (Theory 100 + Practical 50): 150 reduced to 100 and presented in 10 Scale (GP)

REFERENCES

1.	Fundamentals of Genetics	Singh B D 1990. Kalyani Publishers, New Delhi
2.	Elements of Genetics	Phundan Singh 1995. Kalyani Publishers, New Delhi
3.	Genetics	Strickberger M W 1976. Mac Millan Co. Inc., New York
4.	Plant Biotechnology	Chawla H S 2002. Oxford & IBH Publishing Co. New Delhi
5.	Cell Biology, Genetics, Molecular Biology, Evolution & Ecology	Verma P S and Agarwal V K 1978. S.Chand & Co., New Delhi
6.	Cytology, Genetics and Cytogenetics	Gupta P K 1985. Rastogi Publication, India
7.	Cytology and Genetics	Dhyansagar V R 1986. Mc Graw-Hill Publishing Co.

1.	Course No.:	SSAC 121
2.	Course Title	INTRODUCTION TO SOIL SCIENCE
3.	Credit Hours	3 (2+1)
4.	Semester	First Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To make students know the Fundamentals of Soil Science and impart skills in collecting and analyzing soils for basic physical, physico-chemical and chemical properties for using it as a medium for plant growth.
7.	Specific objectives:	-

A.Theory:

By the end of the course, the B.Sc.(Ag.) students will be able to

- i) Discuss the fundamentals/principles of soil Science
- ii) Explain how different soils are formed and how does soil act as a medium for plant growth

B.

Practical:

By the end of the course, the students will be able to

- i) Identify important rocks and mineral species
- ii) Describe soil profiles
- iii) Collect a representative soil sample from field and
- iv)

Analyze the soils for basic physical, physico-chemical & chemical properties

SSAC 121 INTRODUCTION TO SOIL SCIENCE

THEORY

Sl. No	Topic / Lesson	Time required(Hrs)	Teaching method	Teaching aid	Ref.
1.	Microscopy	1	Interactive lecture	Chalk board	3
2.	Rocks- Classification of rocks based on mode of origin - igneous rocks, sedimentary rocks and metamorphic rocks. Classification of rocks based on silica content. Weather ability of rocks.	1	Interactive lecture	Chalk board	3
3.	Minerals - Primary, secondary, essential and accessory minerals. Primary minerals-quartz, feldspar, micas, pyroxenes, amphiboles and olivines. Weather ability of primary minerals.	1	Interactive lecture	Chalk board & Over lay Transparency	3
4.	Non silicate minerals- P, Ca, Mg, S and micronutrient containing minerals. Secondary silicate minerals Basic structural units.	1	Interactive lecture	Chalk board	2,3&4
5&6.	Weathering- Types of weathering. Physical weathering of rocks, agents of physical weathering and their role. Chemical weathering solution, hydration, hydrolysis, carbonation, oxidation and reduction. Biological weathering role of flora and fauna in weathering process	1	Interactive lecture	Chalk board	1&3
7&8.	Parent material-. Classification of parent materials based on their mode of transport by different agents. Soil formation. Soil forming factors - classification and their role in soil formation. Catena.	1	Interactive lecture	Chalk board	1&3
9.	Pedogenic processes- Eluviations, illuviation, humification, calcification, laterization, podzolisation, melanisation, salinization and alkalization	1	Interactive lecture	Chalk board strip Transparency	3 &1
10.	Soil profile Detailed description of a theoretical soil profile. Differences between surface soil and subsoil.	1	Interactive lecture	Chalk board & Power Point Presentation	3&1
11.	Soil physical properties-Soil texture-Definition. Various inorganic components in soil and their properties Particle size analysis Methods. Various textural classes in soil and their properties.	1	Interactive lecture	Chalk board	5&6
12.	Stokes law-Derivation. Assumptions and limitations. Significance of soil texture.	1	Interactive lecture	Chalk board	6
13.	Soil consistence-. Consistence of wet and dry soils. Soil crusting. Soil plasticity-Atterbergs plastic limits-factors affecting plastic limits. Significance of soil consistence.	1	Interactive lecture	Chalk board& Window type Transparency	5&6
14.	Soil structure- Classification-types, classes and grades of soil structure. Genesis of soil structure. Factors affecting formation of aggregates-physical, chemical and biological factors. Synthetic organic amendmets. Importance of soil structure and its management.	1	Interactive lecture	Chalk board& Picture Transparency	5&6

15.	Density of soil - Bulk density and particle density. Factors affecting density parameters. Importance of bulk density of soil. Soil compaction-its importance. Pore space-importance-Calculation of porosity.	1	Interactive lecture	Chalk board	5&6
16.	Soil strength and its importance. Soil color-components. Significance of soil colour.	1	Interactive lecture	Chalk board	6&7
17.	Soil water- Properties of soil water-structure, density, change of state, solvent action, heat capacity and heat of wetting, viscosity, surface tension. Forces of soil water retention. pF concept. Soil moisture characteristic curves. Importance of soil water	1	Interactive lecture	Chalk board	6&7
18.	Soil water potential-Components of water potentials. Soil moisture constants - field capacity, wilting coefficient, hygroscopic water and saturation. Available water and methods for determining soil moisture constants pressure plate and pressure membrane apparatus	1	Interactive lecture	Chalk board & Picture Transparency	6&7
19.	Soil water content -Methods for determination of soil moisture-gravimetric method, tensiometer and neutron moisture meter.	1	Interactive lecture, Demonstration	Chalk board	6&7
20.	Soil water movement-Darcys law. Saturated, unsaturated and vapour flows. Infiltration, percolation and permeability. Distribution of water in profile in different soils. Soil drainage and its importance.	1	Interactive lecture	Chalk board	6&7
21.	Soil temperature- Sources of heat. Heat capacity and conductivity. Factors influencing soil temperature. Modification of soil thermal regimes. Measurement of soil temperature. Importance of soil temperature on crop growth. Management of soil temperature and importance.	1	Interactive lecture	Chalk board & Strip Transparency	6&7
22.	Soil air Compositions of atmospheric air and soil air. Gaseous exchange. Influence of soil air on plant growth, soil properties and nutrient availability-Measurement of ODR-Measures to improve soil aeration.	1	Interactive lecture	Chalk board	5,6&7
23.	Soil air Compositions of atmospheric air and soil air. Gaseous exchange. Influence of soil air on plant growth, soil properties and nutrient availability-Measurement of ODR-Measures to improve soil aeration.	1	Interactive lecture	Chalk board	1&8
24.	Secondary silicate clay minerals of different types - kaolinite, illite, montmorillonite and chlorite; their structures and properties. Allophanes. Genesis of silicate clays	1	Interactive lecture	Models	8
25.	Origin of charge in organic and inorganic colloids-negative and positive charges. Differences between organic and inorganic soil colloids	1	Interactive lecture	Chalk board	8
26.	Adsorption of ions. Types of ion exchange - cation and anion exchange. Cation and anion exchange capacities of soil. Base saturation. Factors effecting ion exchange capacity of soils. Importance of CEC of soils. Calculation of base exchange capacity and exchangeable acidity	1	Lecture & Tutorials	Chalk board	1&2
27& 28	Soil organic matter- Various sources. Composition compounds in plant residues, their decomposability. Humus- Definition, synthesis of humus. Importance of soil organic matter and humus. Fractions of soil	1	Interactive lecture	Chalk board & Strip Transparency	3

	humus. Carbon cycle. Carbon: nitrogen (C: N) ratio of commonly available organic residues. Significance of C:N ratio in soil fertility				
29&30	Soil biology Biomass - Flora and fauna; their important characteristics. Roles of beneficial organisms - organic matter decomposition, mineralization, immobilization, nitrogen fixation, denitrification, solubilization of phosphorus and sulphur and micronutrients. Harmful activities of soil organisms. 1&2	1	Interactive lecture	Chalk board & Strip Transparency	3
31.	Soil classification-Early system of soil classification. Diagnostic horizons. Soil Taxonomy -Order, Sub order, great group, subgroup, family and series. Nomenclature according to Soil Taxonomy	1	Interactive lecture	Chalk board & Strip Transparency	3
32.	Important soil groups of India-Alluvial soils, black soils, red soils, laterite soils and coastal sands.BB,OHP,3	1	Interactive lecture	Chalk board	1&3

PRACTICALS

Sl. No	Practical	Time required(Hrs)	Teaching method & Aid to be employed	Ref.
1.	Identification of rocks and minerals	2.5	Specimen identification	
2.	Methods of chemical analysis, principles, techniques and calculations	2.5	Interactive& tutorial	9&10
3.	Collection of soil samples & preparation of soil water extract	2.5	Field exercise	9&10
4.	Description of soil profile in the field	2.5	Field exercise	9&10
5.	Determination of mechanical composition of soil using Bouyoucos Hydrometer	2.5	Laboratory experiment	9
6.	.Determination of bulk density & particle density	2.5	Laboratory experiment	9
7.	Determination of maximum water holding capacity of soil using Keen - Razkowski cups.	2.5	Laboratory experiment	9
8.	Determination of soil moisture content by gravimetric method and soil color using Munsell color chart	2.5	Field exercise	9&10
9.	Determination of infiltration rate	2.5	Field exercise	9&10
10.	Determination of soils strength by cone penetrometer and aggregate analysis by wet sieving method	2.5	Field exercise	9&10
11.	Determination of pH and electrical conductivity of soil	2.5	Laboratory experiment	9&10
12.	Determination of carbonates and bicarbonates in soil water extract	2.5	Laboratory experiment	1&2
13.	Determination of chlorides in soil water extract	2.5	Laboratory experiment	9&10
14.	Estimation of Ca and Mg in soil water extract by volumetric method	2.5	Laboratory experiment	9&10
15.	Estimation of K and Na by flame photometry	2.5	Laboratory experiment	9&10
16.	Estimation of organic carbon content in soil	2.5	Laboratory experiment	9&10

EVALUATION

THEORY		
Mid semester examination	50 Marks	Reduced to 40 Marks
Semester final theory examination	100 Marks	Reduced to 60 Marks
TOTAL	150 Marks	Reduced to 100 Marks
PRACTICAL		
Classwork & Record		25 Marks
Semester final practical examination		25 Marks
TOTAL		50 Marks

Total (Theory 100 + Practical 50): 150 reduced to 100 and presented in 10 Scale (GP)

REFERENCES

1.	Text book of Soil Science	Biswas T D and Mukherjee S K 1987. Tata McGraw Hill Publishing Co. Ltd., New Delhi
2.	The Nature and Properties of Soils	Brady Nyle C and Ray R Well 2002. pearson Education Inc.,New Delhi
3.	Soil Pedology	Sehgal J L 1996 . Kalyani Publications, Ludhiana
4.	Fundamentals of Soil Science	Indian Society of Soil Science 1998. IARI, New Delhi
5.	Soil Physics	Baver L D Gardener W H and Gardener W R 1972. Wiley Eastern Ltd, New Delhi
6.	Soil Physics	Ghildyal B P and Tripathi R P 1987. Wiley Eastern Ltd., New Delhi
7.	Environmental Soil Physics	Daniel Hillel 1998. Academic Press, New York
8.	Introductory Soil Science	Dilip Kumar Das, 2004. Kalyani Publishers, Ludhiana.
9.	A Text Book of Soil Analysis	Baruah T C and Barthakur H P 1998. Vikas Publishing House Pvt Ltd, New Delhi.
10.	Methods of Analysis of Soils, Plants, Waters and Fertilisers	Fertilisers Development & Cosultation Organisation 1993. C10 Greater Kailash I New Delhi.
1.	Course No.:	AECO 141
2.	Course Title	PRINCIPLES OF AGRICULTURAL ECONOMICS
3.	Credit Hours	2(2+0)
4.	Semester	First Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To acquaint the students with the theory and Principles of Economics applied in Agriculture
7.	Specific objectives:	-

A.Theory:

By the end of the theory classes the students will be able to

- i) To teach students about basic terms and concepts in economics
- ii) To teach students about certain theories like demand, supply markets, price determination which will form basis to learn about subject mater in advanced courses like Production Economics, Farm Management, Agricultural marketing
- iii) To make students familiar about economic conditions of National Income, Public Finanace, Public Revenue, Taxation, Public Expenditure.

AECO 141 PRINCIPLES OF AGRICULTURAL ECONOMICS THEORY

Sl. No	Lesson	Time required(Hrs)	Teaching Method	Teaching method/Aid to be used	Ref.
1.	Introduction Importance of plant pathogens. Important phytopathogenic organisms viz.,fungi, bacteria, fastidious vascular bacteria (R.L.O s), phytoplasmas (M.L.Os), spiroplasmas, viruses, viroids, algae, protozoa and nematodes.	1	lecture	LCD power point	2,4,5
2,3,4	General characteristics of fungi Fungus definition, somatic structures, types of fungal thalli plasmodium, unicellular and filamentous, eucarpic, holocarpic, ectophytic, endophytic, inter cellular, intra cellular and vascular, fungal tissues- plectenchyma (prosenchyma, pseudoparenchyma). Modifications of mycelium (rhizomorphs,rhizoids, sclerotium, stroma, haustoria, appressorium). Asexualreproduction fragmentation, fission, budding, and sporulation, Sexual reproduction- planogametic copulation, gametangial contact, gametangial copulation, spermatisation, somatogamy . parasexual cycle. life cycle patterns displayed by different fungi with example	3	Lecture seminar	Window transparency & chalk board	1,3
5.	Classification of fungi Classification of fungi up to the level of genus. Important characteristics of divisions- Myxomycota, Eumycota and sub divisions: 1.Mastigomycotina 2.Zygomycotina 3. Ascomycotina 4.Basidiomycotina and 5. Deuteromycotina	1	Lecture assignment	Window transparency & chalk board	1,3
6, 7	Study of important phytopathogenic fungi. Division: Myxomycota-Important characteristics up to the level of genus. Class: Plasmodiophoromycetes Order : Plasmodiophorales eg: <i>Plasmodiophora</i> and <i>Spongospora</i> .	2	lecture	Window transparency & chalk board	1,3,4
8 9	Division: Eumycota, Sub- Division: Mastigomycotina- Important characteristics up to the level of genus. Class - Chytridiomycetes- Order- Chytridiales, Family- Synchytriaceae, eg. <i>Synchytrium</i> .	2	Lecture	Window transparency & chalk board	1,3,4
10& 11	Class: Oomycetes, Order: Peronosporales, Family: Pythiaceae- eg. <i>Pythium</i> , <i>Phytophthora</i> ,. Family- Albuginaceae, eg. <i>Albugo</i> ; Family: Peronosporaceae eg. <i>Sclerospora</i> , <i>Peronospora</i> , <i>Peronosclerospora</i> , <i>Plasmopara</i> , <i>Pseudoperonospora</i> and <i>Bremia</i> ..	2	Lecture	Window transparency & chalk board	1,3,4
12	Sub- Division: Zygomycotina Important characteristics up to the level of genus. Class: Zygomycetes, Order : Mucorales, Family: Mucoraceae. eg. <i>Rhizopus</i>	1	Lecture	Window transparency & chalk board	1,3,4
13, 14	Sub- Division: Ascomycotina - Important characteristics up to the level of genus. Typical life cycle pattern displayed by <i>Pyronema omphalodus</i> . Class: Hemiascomycetes, Order- Taphrinales, Family- Taphrinaceae eg. <i>Taphrina</i>	2	lecture	Window transparency & chalk board	1,3,4
15, 16	Class- Plectomycetes, Order Eurotiales, Family Eurotiaceae. eg. <i>Eurotium</i> and <i>Talaromyces</i> . Order Erysiphales, Family: Erysiphaceae- eg. <i>Erysiphe</i> , <i>Leveillula</i> , <i>Phyllactinia</i> , <i>Uncinula</i> , <i>Sphaerotheca</i> , <i>Podosphaera</i> and <i>Microsphaera</i> , characteristics of ascocarps and their conidial stages.	2	lecture	Window transparency & chalk board	1,3,4
17& 18	Class- Pyrenomycetes, Order Hypocreales, Family Clavicipitaceae eg. <i>Claviceps</i> Class- Loculoascomycetes-. Order Pleosporales, Family : Venturiaceae, eg. <i>Venturia</i> , Family: Pleosporaceae eg. <i>Cochliobolus</i> . Order	2	lecture	Window transparency & chalk board	1,3,4

	Myriangiales, Family Myriangiaceae eg. <i>Elsinoe</i> . Order Dothidiales, Family Dothidiaceae, eg. <i>Mycosphaerella</i> .				
19, 20 & 21	Sub- Division: Basidiomycotina: Important characteristics up to the level of genus. Class :Teliomycetes- Order: Uredinales, Family: Pucciniaceae- eg. <i>Puccinia</i> , <i>Uromyces</i> , <i>Hemileia</i> . Life cycle of <i>Puccinia graminis f.sp. tritici</i> , Family : Melampsoraceae eg. <i>Melampsora</i> .	3	lecture	Window transparency & chalk board	1,3,4
22 & 23	Order: Ustilaginales, Family: Ustilaginaceae eg. <i>Ustilago</i> , <i>Sphacelotheca</i> , <i>Tolyposporium</i> . Family Tilletiaceae. eg. <i>Tilletia</i> , <i>Neovossia</i> , <i>Urocystis</i>	2	lecture	Window transparency & chalk board	1,3,4
24	Class: Hymenomycetes. Order: Aphyllophorales, Family: Polyporaceae, eg <i>Polyporus</i> , Family: Ganodermataceae-, eg. <i>Ganoderma</i> .	1	lecture	Window transparency & chalk board	1,3,4
25	Sub- Division- Deuteromycotina- Important characteristics up to the level of genus. . Saccardoan spore group system.	1	lecture	Window transparency & chalk board	1,3,4
26, 27 & 28	Class: Coelomycetes. Order: Sphaeropsidales, Family Sphaeropsidaceae, eg. <i>Phoma</i> , <i>Phomopsis</i> , <i>Macrophomina</i> , <i>Phyllosticta</i> , <i>Septoria</i> , <i>Diplodia</i> and <i>Botryodiplodia</i> . Family Excipulaceae, eg. <i>Ephelis</i> , Family Nectrioidaceae, eg. <i>Zythia</i> , Order Melanconiales, Family Melanconiaceae, eg. <i>Colletotrichum</i> , <i>Gloeosporium</i> , <i>Pestalotiopsis</i> , <i>Pestalotia</i> .	3	lecture	Window transparency & chalk board	1,3,4
29, 30	Prokaryotes - classification (According to BMSB,1994) with examples . Bacteria: Important characteristics of phytopathogenic bacteria with key for identification of important genera and diseases. eg. <i>Streptomyces</i> , <i>Pseudomonas</i> , <i>Ralstonia</i> , <i>Burkholderia</i> , <i>Xanthomonas</i> , <i>Agrobacterium</i> . <i>Erwinia</i> , <i>Bacillus</i> , <i>Corynebacterium</i> . <i>Clavibacter</i> , <i>Curtobacterium</i> . <i>Acetobacter</i> , <i>Rhizobacter</i> , <i>Pectobacterium</i> , <i>Serratia</i> , <i>Nocardia</i> ,	2	lecture	Window transparency & chalk board	5
31	Phytoplasmas and Spiroplasmas. Important characteristics of Phytoplasmas and Spiroplasmas with examples of genera, diseases and transmission. Eg. <i>Phytoplasma</i> , <i>Spiroplasma</i>	1	lecture	Window transparency & chalk board	5
32	Viruses, Viroids Important characteristics of plant viruses and Viroids.. Classification of plant viruses and methods of transmission. Examples of Important plant viruses and viroid diseases.	1	lecture	Window transparency & chalk board	2

EVALUATION

THEORY		
Mid semester examination	50 Marks	Reduced to 40 Marks
Semester final theory examination	100 Marks	Reduced to 60 Marks
TOTAL	150 Marks	Reduced to 100 Marks

Total 100 marks presented in 10 Scale (GP)

REFERENCES

1.	A Text Book of Modern Economics	Jain P C 1960, Allahabad Chaitanya Publishing House, Allahabad
2.	Modern Economic Theory	Dewett K K and Chand A 1979. S.Chand & Co., New Delhi.
3.	Elementary Economics	Dewett. K K and Varma J D 1986. S.Chand & Co., New Delhi.
4.	Agricultural Economics	Subba Reddy S and Raghu Ram P 2004. Oxford & IBM Publishing Co. Private Limited, New Delhi.
1.	Course No.:	PATH 171
2.	Course Title	INTRODUCTION TO PLANT PATHOGENS
3.	Credit Hours	3 (2 +1)
4.	Semester	First Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To provide a very broad overview of Phyto pathogens and to impart sound practical skills in handling Plant pathogens
7.	Specific objectives:	-

A.Theory:

By the end of the course the students will be able to:

To provide an insight to the introduction of pathogens associated with crop plants to the students studying for their basic degree

B. Practical:

To acquaint the basic knowledge on phytopathogens and to develop competence in the subject by improving practical skills

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PATH 171 INTRODUCTION TO PLANT PATHOGENS

Sl. No	Lesson	Time required(Hrs)	Teaching Method	Teaching method/Aid to be used	Ref.
1.	Introduction Importance of plant pathogens. Important phytopathogenic organisms viz.,fungi, bacteria, fastidious vascular bacteria (R.L.O s), phytoplasmas (M.L.Os), spiroplasmas, viruses, viroids, algae, protozoa and nematodes.	1	lecture	LCD power point	2,4,5
2,3,4	General characteristics of fungi Fungus definition, somatic structures, types of fungal thalli plasmodium, unicellular and filamentous, eucarpic, holocarpic, ectophytic, endophytic, inter cellular, intra cellular and vascular, fungal tissues- plectenchyma (prosenchyma, pseudoparenchyma). Modifications of mycelium (rhizomorphs,rhizoids, sclerotium, stroma, haustoria, appressorium). Asexualreproduction fragmentation, fission, budding, and sporulation, Sexual reproduction- planogametic copulation, gametangial contact, gametangial copulation, spermatisation, somatogamy . parasexual cycle. life cycle	3	Lecture seminar	Window transparency & chalk board	1,3

	patterns displayed by different fungi with example				
5.	Classification of fungi Classification of fungi up to the level of genus. Important characteristics of divisions- Myxomycota, Eumycota and sub divisions: 1.Mastigomycotina 2.Zygomycotina 3. Ascomycotina 4.Basidiomycotina and 5. Deuteromycotina	1	Lecture assignment	Window transparency & chalk board	1,3
6, 7	Study of important phytopathogenic fungi. Division: Myxomycota-Important characteristics up to the level of genus. Class: Plasmodiophoromycetes Order : Plasmodiophorales .eg: <i>Plasmodiophora</i> and <i>Spongospora</i> .	2	lecture	Window transparency & chalk board	1,3,4
8 9	Division: Eumycota, Sub- Division: Mastigomycotina- Important characteristics up to the level of genus. Class Chytridiomycetes- Order- Chytridiales, Family- Synchytriaceae, eg. <i>Synchytrium</i> .	2	Lecture	Window transparency & chalk board	1,3,4
10& 11	Class: Oomycetes, Order: Peronosporales, Family: Pythiaceae- eg. <i>Pythium</i> , <i>Phytophthora</i> ,. Family- Albuginaceae, eg. <i>Albugo</i> ; Family: Peronosporaceae eg. <i>Sclerospora</i> , <i>Peronospora</i> , <i>Peronosclerospora</i> , <i>Plasmopara</i> , <i>Pseudoperonospora</i> and <i>Bremia</i> ..	2	Lecture	Window transparency & chalk board	1,3,4
12	Sub- Division: Zygomycotina Important characteristics up to the level of genus. Class: Zygomycetes, Order : Mucorales, Family: Mucoraceae. eg. <i>Rhizopus</i>	1	Lecture	Window transparency & chalk board	1,3,4
13, 14	Sub- Division: Ascomycotina - Important characteristics up to the level of genus. Typical life cycle pattern displayed by <i>Pyronema omphalodus</i> . Class: Hemiascomycetes, Order- Taphrinales, Family- Taphrinaceae eg. <i>Taphrina</i>	2	lecture	Window transparency & chalk board	1,3,4
15, 16	Class- Plectomycetes, Order Eurotiales, Family Eurotiaceae. eg. <i>Eurotium</i> and <i>Talaromyces</i> . Order Erysiphales, Family: Erysiphaceae- eg. <i>Erysiphe</i> , <i>Leveillula</i> , <i>Phyllactinia</i> , <i>Uncinula</i> , <i>Sphaerotheca</i> , <i>Podosphaera</i> and <i>Microsphaera</i> , characteristics of ascocarps and their conidial stages.	2	lecture	Window transparency & chalk board	1,3,4
17& 18	Class- Pyrenomycetes, Order Hypocreales, Family Clavicipitaceae eg. <i>Claviceps</i> Class- Loculoascomycetes-. Order Pleosporales, Family : Venturiaceae, eg. <i>Venturia</i> , Family: Pleosporaceae eg. <i>Cochliobolus</i> . Order Myriangiiales, Family Myriangiaceae eg. <i>Elsinoe</i> . Order Dothidiales, Family Dothidiaceae, eg. <i>Mycosphaerella</i> .	2	lecture	Window transparency & chalk board	1,3,4
19, 20 & 21	Sub- Division: Basidiomycotina: Important characteristics up to the level of genus. Class :Teliomycetes- Order: Uredinales, Family: Pucciniaceae- eg. <i>Puccinia</i> , <i>Uromyces</i> , <i>Hemileia</i> . Life cycle of <i>Puccinia graminis f.sp. tritici</i> , Family : Melampsoraceae eg. <i>Melampsora</i> .	3	lecture	Window transparency & chalk board	1,3,4
22 & 23	Order: Ustilaginales, Family: Ustilaginaceae eg. <i>Ustilago</i> , <i>Sphacelotheca</i> , <i>Tolyposporium</i> . Family Tilletiaceae. eg. <i>Tilletia</i> , <i>Neovossia</i> , <i>Urocystis</i>	2	lecture	Window transparency & chalk board	1,3,4
24	Class: Hymenomycetes. Order: Aphyllophorales, Family: Polyporaceae, eg <i>Polyporus</i> , Family: Ganodermataceae-, eg. <i>Ganoderma</i> .	1	lecture	Window transparency & chalk board	1,3,4
25	Sub- Division- Deuteromycotina- Important characteristics up to the level of genus. . Saccardoan spore group system.	1	lecture	Window transparency & chalk board	1,3,4
26, 27 & 28	Class: Coelomycetes. Order: Sphaeropsidales, Family Sphaeropsidaceae, eg. <i>Phoma</i> , <i>Phomopsis</i> , <i>Macrophomina</i> , <i>Phyllosticta</i> , <i>Septoria</i> , <i>Diplodia</i> and <i>Botryodiplodia</i> . Family Excipulaceae, eg. <i>Ephelis</i> , Family Nectrioidaceae, eg. <i>Zythia</i> , Order Melanconiales, Family Melanconiaceae, eg. <i>Colletotrichum</i> , <i>Gloeosporium</i> , <i>Pestalotiopsis</i> , <i>Pestalotia</i> .	3	lecture	Window transparency & chalk board	1,3,4
29,	Prokaryotes - classification (According to BMSB,1994) with	2	lecture	Window	5

30	examples . Bacteria: Important characteristics of phytopathogenic bacteria with key for identification of important genera and diseases. eg. <i>Streptomyces, Pseudomonas, Ralstonia, Burkholderia, Xanthomonas, Agrobacterium. Erwinia, Bacillus, Corynebacterium. Clavibacter, Curtobacterium. Acetobacter, Rhizobacter, Pectobacterium, Serratia, Nocardia,</i>			transparency & chalk board	
31	Phytoplasmas and Spiroplasmas. Important characteristics of Phytoplasmas and Spiroplasmas with examples of genera, diseases and transmission. Eg. <i>Phytoplasma, Spiroplasma</i>	1	lecture	Window transparency & chalk board	5
32	Viruses, Viroids Important characteristics of plant viruses and Viroids.. Classification of plant viruses and methods of transmission. Examples of Important plant viruses and viroid diseases.	1	lecture	Window transparency & chalk board	2

PRACTICALS

Sl. No	Practical	Time required(Hrs)	Teaching method to be used	Teaching method & Aid to be used	Ref.
1.	AngrauCPS Study of vegetative structures of fungi and their modifications. Study of reproductive structures of fungi (sexual and asexual)	2.5	Lecture & observation of slides	AngrauCPS LCD/Computer power point, Window transparency Slides, Charts	1, 3,4, 6
2.	AngrauCPS Study of <i>Pythium</i> and <i>Phytophthora</i>	2.5	AngrauCPS Lecture & Preparation of slides from culture	AngrauCPS LCD/Computer power point, Window transparency, Slides, Charts Diseased specimens/fungal cultures	1, 3,4, 6
3.	Study of <i>Albugo</i>	2.5	Lecture & section cutting of diseased material	AngrauCPS LCD/Computer power point, Window transparency, Slides, charts Diseased specimens	1, 3,4, 6
4,5	Study of downy mildew fungi and Study of <i>Rhizopus</i>	5	Lecture & preparation of slides from culture scraping of diseased material	AngrauCPS LCD/Computer, power point, Window transparency, Slides, charts Diseased specimens	1, 3,4, 6
6,7	AngrauCPS Study of powdery mildew fungi	5	AngrauCPS Lecture & Scraping of diseased material	AngrauCPS LCD/Computer, power point, Window transparency, Slides, charts Diseased specimens	1, 3,4, 6
8,9	AngrauCPS Study of rust fungi	5	Lecture & section cutting of diseased material	AngrauCPS LCD/Computer, power point, Window transparency, Slides, charts Diseased specimens	1, 3,4, 6
10,11	AngrauCPS Study of smut fungi	5	Lecture & preparation of slides from infected grains	AngrauCPS LCD/Computer power point, Window transparency, Slides, charts Diseased specimens	1, 3,4, 6
12,13	AngrauCPS Study of imperfect fungi	5	Lecture & section cutting/ scraping of diseased material . Preparation of slides from cultures	AngrauCPS LCD/Computer power point, window transparency, Slides, Charts, Diseased specimens/fungal cultures	1, 3,4, 6
14,15	AngrauCPS Isolation of phytopathogenic bacteria from locally available diseased plant material and	5	Lecture & Demonstration on isolation of bacteria	AngrauCPS LCD/Computer, Power point, Window transparency, Demonstration	5

	study of colony characteristics and Grams -staining				
16	AngrauCPS Demonstration of mechanical transmission of plant viruses	1	AngrauCPS Lecture & Demonstration	AngrauCPS LCD/Computer,Power point, Window transparency, Demonstration	2

Note:

- Power point presentation through LCD will be presented at the beginning of the course, before mid term and Final theory examinations.
- Each student has to deliver one seminar for a period of 10 min. related to the Course as a part of class assignment
- Each student has to submit important diagrams pertaining to the course as a part of assignment

Total (Theory 100 + Practical 50): 150 reduced to 100 and presented in 10 Scale (GP)

REFERENCES

1.	Introductory Mycology	Alexopoulos C J Mims C W and Blackwell M 1996. Wiley Eastern Ltd.. New York
2.	Introduction to Plant Viruses	Mandahar C L 1987. Chand and Co. Pvt. Ltd., New Delhi
3.	An introduction to Mycology	Mehrotra R S and Aneja K R 1990. New Age International (P) Ltd. New Delhi
4.	Plant Pathogens- The Fungi	Singh R S 1982. Oxford and I.B.H. Pub. Co., New Delhi
5.	Plant Pathogens- The Prokaryotes	Singh R S 1989. Oxford and I.B.H. Publishing. Co., New Delhi
6.	Introduction to Plant pathogens. Practical Manual	Krishna Rao V, Vithal Reddy T and Subba Reddy C 2006. Department of Plant Pathology, ANGR Agricultural University, Rajendranagar

1.	Course No.:	HORT 181
2.	Course Title	PRINCIPLES OF HORTICULTURE & PRODUCTION TECHNOLOGY OF FRUIT CROPS
3.	Credit Hours	3 (2+1)
4.	Semester	First Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To acquaint the 1st year B.Sc. (Ag) student with the knowledge of the principles of Horticulture and production technology of fruit crops.
7.	Specific objectives:	-

A.Theory:

By the end of the course the students will be able to:

- Describe the principles of Horticulture.
- Discuss Production technology of different fruit crops.

B.Practical:

By the end of the practical exercises, the students will be able to:

- i) Propagation techniques in different fruit crops.
- ii) Identification of different fruit crops and their varieties.

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HORT 181 - PRINCIPLES OF HORTICULTURE & PRODUCTION TECHNOLOGY OF FRUIT CROPS

THEORY

Sl. No	Lesson	Time required(Hrs)	Teaching Methods to be used	Teaching method/Aid to be used	Ref.
1.	Definition of Horticulture Importance of horticulture in national economy and balance human nutrition Division of Horticulture - Pomology, Olericulture, Floriculture, spices & Condiments, Medicinal and Aromatic plants, Ornamental and Landscape architecture and Post Harvest Technology etc.	1	Interactive Lecture	Over head projector & Hand written transparency	2, 6 & 7
2.	Horticulture zones in India and Andhra Pradesh: Area and Production of different fruit crops selection of site, fencing and wind breakers etc	1	Interactive Lecture	Hand written transparency	6,7
3.	Influence of environmental factors on production of Horticultural Crops	1	Interactive Lecture	Hand written transparency	2
4.	Planting systems - High density planting, Planting and establishment	1	Interactive Lecture	Over lay transparency	8 & 9
5.	Propagation - various methods of propagation - sexual asexual and micro propagation - seed propagation - seed dormancy - types of dormancy, methods of breaking dormancy - scarification and stratification	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9
6.	Rootage - cuttage and layerage - different types of cuttings and layering with examples, merits and demerits - inducing rooting by application of growth regulators, methods of application	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9
7.	Graftage - selection of suitable root stocks, characters of good root stocks and scion, selection of scion material - variety, tree and bud wood for budding and grafting and methods of budding	1	Lecture	double projection transparency	8 & 9
8.	Graftage - Different methods of grafting - including Top working, Double working Graft incompatibility - Characteristic symptoms of incompatibility - Types of incompatibility	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9
9.	Stock and scion relationship - influence of stock and scion in respect of certain characters like growth, flowering, yield, fruit quality etc	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9
10.	Micro propagation	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9
11.	Training - objectives of training, different systems of training such as central leader, open centre, and modified leader merits and demerits of each system. Pruning - objectives of pruning	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9

12.	Methods of pruning - response of plants to pruning such as activation old bud, water shoot production, dwarfing and delay	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9
13.	Use of growth regulators in propagation, fruit production and post harvest treatments	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9
14.	Citrus - origin and distribution - important species and cultivars, soils, climate requirements - propagation - different types of rootstocks used in citrus, selection of bud wood for budding	1	Interactive Lecture	Hand written & Drawing Transparency	8 & 9
15.	Citrus - preparation of land, for planting, spacing, Irrigation, Manuring and fertilization, interculture, cropping and crop regulation, fruiting, harvesting and yield.	1	Interactive Lecture	Hand written & Drawing Transparency	4, 5 & 10
16.	Mango - origin, distribution, - important varieties and hybrids varieties, for different regions and purposes, soil and climate, propagation of mango.	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
17.	Mango - Planting, irrigation, Manuring, intercultivation, flowering, harvesting yield post harvest handling of fruits and physiological disorders	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
18.	Grape - origin and distribution, characters of Evitis and Muscadina , varieties seeded and seedless, soil and climate, propagation, preparation of land and digging of pits, planting and different methods of training	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
19.	Grape - Types of pruning, irrigation and Manuring, intercultivation, Use of growth regulators in grape production, Harvesting, Yield, post harvest handling of grapes and physiological disorders	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
20.	Banana - origin and distribution, importance of crop, soil and climate, important varieties, propagation, preparation of land and digging of pits, season of planting, irrigation, manuring, intercultivation, harvesting and post harvest handling & yield	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
21.	Guava - origin and distribution, importance of crop, varieties, soil and climate, propagation, preparation of land, planting, irrigation, Manuring intercultivation, pruning, flowering and flower regulation, harvesting and yield.	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
22.	Sapota - origin and distribution, varieties, soil and climate, propagation, preparation of land, planting, irrigation, Manuring, intercultivation, harvesting and yield	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
23.	Apple and litchi - origin and distribution, varieties, rootstocks, propagation, climate and soil requirements, preparation of land, planting, irrigation and manuring intercultivation, harvesting post harvest handling and yield	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
24.	Papaya - Origin and distribution, important of crop, soil and climate, varieties, propagation, preparation of land, method of planting, time of planting, irrigation and manuring , intercultivation, harvesting and post harvest handling and yield and papain extraction	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
25.	Pine apple - origin and distribution, importance, varieties, soil and climate, requirements, propagation methods, planting, intercultivation, irrigation, and manuring, flowering, induction for uniform flowering, harvest and	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10

	yield.				
26.	Ber- - origin, importance, varieties, soil and climate, propagation, planting Training and pruning, irrigation, and manuring crop regulation intercultivation, harvesting and yield.	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
27.	Annonaceous fruits - origin, species and varieties, soil and climate requirements, propagation, planting, irrigation and Manuring, intercultivation, flowering, harvesting and yield.	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
28.	Pomegranate - origin, important varieties, soil and climate requirements, propagation, planting, Training and pruning, irrigation, and manuring, intercultivation, crop regulation, harvesting and yield.	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
29.	Fig - Origin, Types of fig, important varieties, soil and climate requirements, preparation of land, propagation, planting, Training and Pruning, irrigation and Manuring, intercultivation, harvesting and yield	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
30.	Phalsa and Jackfruit - Origin, important varieties, soil and climate requirements, planting, Training and Pruning, irrigation and Manuring, inter cultivation, harvesting and yield.	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
31.	Pear and plum - Origin, important varieties, soil and climate, propagation, planting, Training and Pruning, irrigation and Manuring, intercultivation, harvesting and yield.	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10
32.	Peaches and cherry: Origin, important varieties, soil and climate, propagation, planting, irrigation and Manuring, intercultivation harvesting and yield.	1	Interactive Lecture	Hand written & Drawing Transparency (photos)	4, 5 & 10

PRACTICALS

Sl. No	Practical	Time required(Hrs)	Teaching method to be employed	Ref.
1.	Identification of Horticultural tools & implements and their use.	2	Exhibition	2,6 & 7
2.	Different containers, preparation of potting mixture, potting, de-potting and repotting.	2	Individual participation in result method demonstration	8 and 9
3.	Propagation through seeds, methods to overcome the seed dormancy - a) Mechanical scarification b) Soaking the seeds in water c) Acid scarification d) Stratification	2	Method demonstration	8 and 9
4.	Vegetative propagation by corms, bulbs, rhizomes etc.	2	Method demonstration	8 and 9
5.	Propagation methods like for cutting and layering.	2	Method demonstration	8 and 9
6.	Vegetative propagation like budding.	2	Method demonstration	8 and 9
7.	Vegetative propagation like Grafting.	2	Method demonstration	7
8.	Field preparation, layout and different planting systems.	2	Students are involved for preparing the land and layout for different planting systems	3
9.	Preparation of stock solutions of different growth regulators.	2	Method demonstration	4, 5 & 10
10.	Training and pruning in grape.	2	Method demonstration	4, 5 & 10

11.	Pruning in Ber & Phalsa	2	Method demonstration	2,4 & 5
12.	Identification and description of important varieties of Mango, Guava and Citrus.	2	Visits to fruit research station, live specimens and models	2,4 & 5
13.	Identification and description of important varieties of Grape, Sapota, Banana and Papaya.	2	Visits to fruit research station, live specimens and models	10
14.	Irrigation Methods - Micro irrigation in fruit crops.	2	Visit to the orchards micro irrigation system	5
15.	Fertilizer application in fruit crops.	2	Method demonstration and individual student participation	-
16.	Visit to orchards.	2	-	-

REFERENCES

1.	Fruit Growing in India	Heyes W B, 1953. Kitabistan, Allahabad
2.	Fundamentals of Horticulture	Edmond J B Senn T L and Andrews F.S , 1964. McGraw Hill Book Co., New York
3.	Plant Propagation - Principles and Practices	Hartman H T and Kester D E, 1968. Prentice Hall of India Publishing Ltd., Bombay
4.	Fruits	Ranjit Singh 1969. National Book Trust New Delhi
5.	Fruits - Tropical and Subtropical	Bose T K and Mitra S K ,1990. Nayaprakashan, Calcutta
6.	Principles of Horticulture	Denisen E. L, 1957 MacMillan Publishing Company, New York
7.	Introduction to Horticulture	Kumar N, 1990 Rajyalakshmi Publications, Nagarcoil, TamilNadu
8.	Plant Propagation	Sadhu M.K, 1996 New Age International Publishers - New Delhi.
9.	Propagation of Fruit Crops	Mukherjee S K and Majumder P K, 1973 ICAR, New Delhi.
10.	Text Book on Pomology Vol.II- III	Chattopadhyaya, 1997 N Kalyani Publishers Ludhiana.

SECOND SEMESTER

1.	Course No.:	BICM 101
2.	Course Title	BIOCHEMISTRY
3.	Credit Hours	3 (2+1)
4.	Semester	Second Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To improve the knowledge & skills of I st year B.Sc.(A.g) students in fundamentals of Biochemistry
7.	Specific objectives:	-

A.Theory:

By the end of the course, the students will be able to

- i) Understand the concepts of Biochemistry
- ii) Understand the life processes
- iii) Understand the chemical reactions occurring in living organisms

B.**Practical:**

By the end of the course, the students will be able to

- i) Have a clear concept of the structures of biomolecules
- ii) Prepare the mini models of biomolecules
- iii) Separate biomolecules using different techniques

[TOP](#)

BICM

101

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BIOCHEMISTRY

Theory (need to update below content)

Sl. No	Lesson	Time required(Hrs)	Teaching Methods to be used	Teaching method/Aid to be used	Ref.
1.	Introduction and importance of Biochemistry	1	Interactive lecture	Chalk Board	1
2.	Plant cell, various organelles in plant cell, their functions	1	Interactive lecture	Chalk Board & strip Transparency	1
3.	Different components of plant cell wall, role of plant cell-wall in live stock, food and paper industry	1	Interactive lecture	Window transparency & chalk board	1 & 2
4.	Proteins: Amino Acid Introduction, protein amino acids, classification, reactions of amino acids- Ninhydrin reaction, peptide bond, Schiffs base formation.	1	Interactive lecture	Chalk board & Over lay Transparency	2&3
5.	Peptides-oligo peptides, Functions Cyclic, acyclic peptides, Malformin, Glutathione, Gramicidin Hormones- insulin	1	Interactive lecture	Chalk board	4&1
6.	Structure of proteins - Primary, Secondary, Tertiary and Quaternary and forces involved in stabilizing.	1	Interactive lecture	Window transparency & chalk board	1&2
7.	Properties: U V absorption, Immunological properties, Denaturation & solubility.	1	Interactive lecture	Chalk board	3&2

8.	Molecular chaperones, sequencing by phenylisothiocyanate method. Classification of proteins based on functions.	1	Interactive lecture	Chalk board, Overlay & Rotatory Transparency	3&4
9.	Purification techniques like salting in and salting out, gel filtration and ion-exchange chromatography	1	Interactive lecture	Chalk board, Overlay & Rotatory Transparency	1&2
10.	Enzymes: Mode of action, speed and specificity, active site, catalysis, co-enzymes, measurement of enzyme activity.	1	Interactive lecture	Chalkboard	1&3
11.	Factors affecting enzyme activity, inhibition.	1	Interactive lecture	Chalk Board & Picture transfer Transparency	1&3
12.	Immobilization and industrial application of enzymes	1	Interactive lecture	Chalk Board	1&3
13.	Lipids:- classification, functions, properties like saponification, Hydrogenation, Iodine number and Acid number.	1	Interactive lecture	Chalk Board	2&4
14.	Acyl lipids, their industrial application in soaps detergents, paints etc.	1	Interactive lecture	Chalk board	4&1
15.	Carbohydrates: Introduction, functions, structure and classification.	1	Interactive lecture	Chalk board & Over lay Transparency	1&2
16.	Role of mono, oligo and poly saccharides in industry	1	Interactive lecture	Chalk Board	6&2
17.	Nucleic Acids: Functions, nucleotides, structure of DNA	1	Interactive lecture	Chalk board & Hand written Transparency	1&3
18.	Various types of DNAs and RNAs, packing into chromosome	1	Interactive lecture	Chalk board & Picture transfer Transparency	1&2
19.	Metabolism: metabolism of proteins - translation	1	Interactive lecture	Chalk board & Picture transfer Transparency	4&1
20.	Degradation of proteins into amino acids like decarboxylation	1	Interactive lecture	Chalk Board	3&4
21.	Transamination, deamination, & urea cycle	1	Interactive lecture	Chalk Board & Handwritten	3&4

				Transparency	
22.	Metabolism of lipids- biosynthesis of S.F.A, USFA & TAG	1	Metabolism of lipids- biosynthesis of S.F.A, USFA & TAG	Chalkboard & Hand written Transparency	1&2
23.	Degradation of lipids and fatty acid oxidation	1	Interactive lecture	Chalk board& Hand written Transparency	3&1
24.	Metabolism of carbohydrates synthesis of carbohydrates	1	Interactive lecture	Chalk board	2&3
25.	Hydrolysis of starch, Glycolysis, TCA cycle	1	Interactive lecture	Chalk board & Hand written Transparency	3&4
26.	Oxidative pentose phosphate pathway	1	Interactive lecture	Chalk board & Picture transfer Transparency	3&4
27.	Metabolic energy generation & oxidative phosphorylation	1	Interactive lecture	Chalk board & Transparency	1&3
28.	ETC in mitochondria & chloroplasts	1	Interactive lecture	Chalk board & Picture transfer Transparency	1&3
29.	Metabolic regulation- Lac operon	1	Interactive lecture	Chalk board & Picture transfer Transparency	1&4
30.	Secondary metabolism - Terpenoids	1	Interactive lecture	Chalk board & Hand drawn Transparency	1&5
31.	Alkaloids	1	Interactive lecture	Chalk board & hand drawn Transparency	5
32.	Phenolics	1	Interactive lecture	Chalk board& Hand drawn transparency	5

PRACTICALS

S.No	Practical	Time required (Hrs)	Teaching Method to be used	Ref.
1	Introduction & Atomic models of Amino acids	2	Demonstration of atomic model	8 & 7
2	Protein denaturation- heat, pH, precipitation of proteins with heavy metals, immune reaction	2	Lab experiment	8 & 9
3	Paper electrophoresis for separation of plant pigments	2	Lab experiment	6 & 7
4	Paper model of proteins & Protein estimation by Lowry method	2	Lab experiment	8,& 9
5	Enzymes kinetics (graphical), competitive inhibition,	2	Tutorial	8
6	Enzyme immobilization. Enzyme induction	2	Lab experiment	6
7	Extraction of nucleic acids, column chromatography of RNA hydrolysate	2	Lab experiment	6 & 7
8	Fatty acid model, characterization of lipids by TLC	2	Lab experiment	6 & 7
9	Extraction of oil from oil seeds	2	Lab experiment	6 & 7
10	Estimation of fatty acids by GC	2	Lab experiment	6
11	Models of sugars, sucrose & starch (atomic & paper)	2	Lab experiment	8
12	Quantitative determination of sugars after removal of interfering substances.	2	Lab experiment	8
13	Separation of sugars and amino acids by paper chromatography	2	Lab experiment and model building	8
14	Determination of phenols	2	Lab experiment	6 & 7
15	Industrial visit	2	-	-
16	Practical exam	2	-	-

[TOP](#)

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1.	Principles of biochemistry	Lehninger A L Nelson D A and Cox M M 2005 (4th edition). CBS Publishers and Distributors, new Delhi.
2.	Biochemistry	Stryer L 2005. (5th edition). W.H. Freeman and Company, New York.
3.	Biochemistry	Voet D and Voet J G 2004.(3rd edit.) Joun Wiley & Sons Incl. USA
4.	Outlines of biochemistry	Conn E E , Stumpf P K , Bruening G and Doi R H 1995. John Wiley

		& Sons Incl. Singapore
5.	Biochemistry and Molecular biology of plants	Buchanan Gruissem Jones 2002. (3rd edition) John Wiley and Sons, UK
6.	An introduction to practical biochemistry	Plummer D T (2nd edition) 1979. Tata McGraw Hill Publishing Co., New Delhi.
7.	Biochemical methods for agricultural sciences	Sadasivam S Manickam A 1996. (2nd edition). New Age International Publisher, New Delhi.
8.	Practical Biochemistry	Rameshwar A 2006(3rd edition). Kalyani Publishers, New Delhi
9.	Laboratory Manual in Biochemistry	Jayaraman J 1981 (1st edition). Wiley Eastern Publishers, New Delhi.

1.	Course No.:	ENGL101
2.	Course Title	COMPREHENSION AND COMMUNICATION SKILLS IN ENGLISH
3.	Credit Hours	2(1+1)
4.	Semester	Second Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To develop the comprehension and communication skills of I year BSc (Ag) students in English
7.	Specific objectives:	-

A.Theory:

By the end of the course the students will be able to

- i) Understand the basic concepts of comprehension
- ii) Understand the fundamentals of grammar
- iii) Enhance their vocabulary
- iX) Improve their skills in written communication

B.

Practical:

By the end of the course, the students will be able to

- i) Have a clear concept of communication skills in English by using AV aids in Spoken English.
- ii) Improve their reading skills.
- iii) Present the reports orally and participate in debates and Group Discussions.

ENGL101 - COMPREHENSION AND COMMUNICATION SKILLS IN ENGLISH
THEORY

S.No	Lesson	Time required (Hrs)	Teaching Method to be used	Teaching method & aid to be used	Ref.
1	War Minus Shooting, Reading Comprehension	1	Interactive lecture	Chalk Board & Tape Recorder	1
2	War Minus Shooting, Reading Comprehension	1	Interactive lecture	Chalk Board & Tape Recorder	1
3	Synonyms, Antonyms	1	Interactive lecture	Hand written Transparency	2,5
4	Words often confused	1	Interactive lecture	Typed Transparency	2,5
5	A Dilemma-A layman looks at Science Reading Comprehension	1	Interactive lecture	Public address system	1
6	A Dilemma-A layman looks at Science Reading Comprehension	1	Interactive lecture	Chalk Board & Public address system	1
7	Homonyms	1	Interactive lecture	Chalk Board & Strip Transparency	2,5
8	Homophones	1	Interactive lecture	Chalk Board & Strip Transparency	2,5
9	You and Your English, Reading Comprehension	1	Interactive lecture	Chalk Board & Public address system	1
10	You and Your English, Reading Comprehension	1	Interactive lecture	Chalk Board & Public address system	1
11	Functional Grammar- Agreement of verb with subject	1	Interactive lecture	Chalk Board & Pull Transparency	2,5
12	Functional Grammar- Agreement of verb with subject	1	Interactive lecture	Chalk Board & Single flap double projection Transparency	2,5
13	Business correspondence	1	Interactive lecture	Chalk Board	3
14	Style in Report Writing	1	Interactive lecture	Chalk Board and Public address system	2,5
15	Precis Writing	1	Interactive lecture	Chalk Board and Window Transparency	6
16	Interviews	1	Interactive lecture	Public Address system	2,5

PRACTICAL

S.No	Lesson	Time required (Hrs)	Teaching method to be used	Teaching method & aid to be used	Ref.
1	Listening to short talks and lectures	2 1/2	Practice in listening	Tape Recorder	7
2	Spoken English, Stress and intonation	2 1/2	Listening to Spoken English cassettes	Tape Recorder	4
3	Seminars and Conferences	2 1/2	Interactive lecture	Chalk Board & Public address system	2,5
4	Seminars and Conferences	2 1/2	Demonstration	Public address system	2,5
5	Oral Presentation by students	2 1/2	Interactive lecture	Public address system	2,5
6	Evaluation of oral presentation	2 1/2	Interactive lecture	Chalk Board	2,5
7	Types of communication-Face to face	2 1/2	Interactive lecture, Role play	Chalk Board & Tape recorder	6,7
8	Types of communication-Telephonic conversation	2 1/2	Interactive lecture, Role play	Chalk Board & Tape recorder	6,7
9	Reading skills	2 1/2	Interactive lecture & demonstration	Public address system	2,5,6
10	Meetings, Purpose, procedure, participation	2 1/2	Interactive lecture	Chalk Board	2,5
11	Meetings, Chairmanship, physical arrangements etc	2 1/2	Interactive lecture & demonstration	Public address system	2,5
12	Presentation of reports by using power point and LCD	2 1/2	Demonstration	LCD projector	2,5
13	Interviews	2 1/2	Interactive lecture	Public address system	2,5
14	Interviews	2 1/2	Practice of Mock interviews	Public address system	2,5
15	Group Discussion	2 1/2	Interactive & Role play	Public address system & Chalk Board	2,5,6
16	Review/Feed back	2 1/2	Feedback of all lectures	Chalk Board	-

REFERENCES

1.	Principles of biochemistry	N.Krishnaswamy & T.Sriraman, 1995, Macmillan India Ltd, Madras.
2.	Business Correspondence and Report Writing	Sharma RC & Krishna Mohan 1978 Tata Mc Graw Hill publishing company, New Delhi

3.	Strengthen your writing	Narayanaswamy VR, 1979, Orient Longman New Delhi
4.	A Textbook of Phonetics for Indian Students	BalasubramanianT, 1989, Orient Longman, New Delhi
5.	Developing Communication Skills	Krishna Mohan and Meera Benerjee1990, Macmillan India Ltd, New Delhi
6.	Business Communication	BalasubramanyamM1985 Vani Educational Books, New Delhi
7.	Telephoning in English	B.Jean Naterop and Rod Revell 1997,Cambridge University press, Cambridge

A.Theory:

By the end of the theory classes the students will be able to
 i) Discuss the Statistical concepts and techniques applied in Agriculture

B.Practical:

By the end of the practical classes the students will be able to
 i) The Statistical techniques to Agricultural data

[TOP](#)

STCA

101

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STATISTICS

THEORY

1.	Course No.:	STCA 101
2.	Course Title	STATISTICS
3.	Credit Hours	2(1+1)
4.	Semester	Second Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To acquaint the students with theory and Practicals of Statistics applied in agriculture
7.	Specific objectives:	-

A.Theory:

By the end of the theory classes the students will be able to
 i) Discuss the Statistical concepts and techniques applied in Agriculture

B.Practical:

By the end of the practical classes the students will be able to
 i) The Statistical techniques to Agricultural data

[TOP](#)

STCA

101

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STATISTICS

THEORY

S.	Topic/Lesson	Time	Teaching	Teaching	Ref.
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No.		required (Hrs)	Methods to be used	methods & Aids to be used	
1.	Introduction to Statistics, Definition, Use of Statistics, Limitations of Statistics	1	Interactive Lecture	Chalk Board	1,2
2.	Frequency Distribution: Construction of Frequency Distribution Table	1	Interactive Lecture	Chalk Board & Strip transparency	1,2
3.	Measures of Central Tendency: Definition, Characteristics of good Average	1	Interactive Lecture	Chalk Board & Strip transparency	1,2
4.	Arithmetic Mean, Median and Mode for Ungrouped and Grouped data- Merits and Demerits of Arithmetic Mean	1	Interactive Lecture	Chalk Board & Window transparency	1,2
5.	Measures of Dispersion: Definition. Standard Deviation, Variance and Coefficient of Variation	1	Interactive Lecture	Chalk Board & Overlay transparency	1,2
6.	Normal Distribution and its properties. Introduction to Sampling: Random Sampling, Concept of Standard Error of Mean	1	Interactive Lecture	Chalk Board & Strip transparency	1,2
7.	Tests of Significance: Introduction, Types of Errors, Null Hypotheses, Level of Significance and Degrees of freedom, Steps involved in Testing of Hypotheses	1	Interactive Lecture	Chalk Board & Strip transparency	1,2
8.	Large sample tests: Test for Means- Z-test, One sample, Two Samples when Population SD known and Unknown	1	Interactive Lecture	Chalk Board & Window transparency	1,2
9.	Small sample tests: Test for Means- one sample t-test, Two sample t-test, Paired t-test	1	Interactive Lecture	Chalk Board & Strip transparency	1,2
10.	Chi-square test in 2x2 Contingency table with Yates Correction, F-test	1	Interactive Lecture	Chalk Board & Window transparency	1,2
11.	Correlation: Definition, Types, Properties, Scatter Diagram, Calculation and testing of r.	1	Interactive Lecture	Chalk Board & Window transparency	1,2
12.	Regression: Definition, Fitting of two lines Y on X and X on Y, Properties, inter relation between correlation and regression	1	Interactive Lecture	Chalk Board & Overlay transparency	1,2
13.	Introduction to Experimental Designs, Basic principles, Assumptions in ANOVA	1	Interactive Lecture	Chalk Board & Strip transparency	1,2
14.	Completely Randomized Design: Layout, Analysis with equal and unequal replications	1	Interactive Lecture	Chalk Board & Strip transparency	1,2
15.	Randomized Block Design: Layout and Analysis	1	Interactive Lecture	Chalk Board & Window transparency	1,2
16.	Latin Square Design: Layout and Analysis	1	Interactive Lecture	Chalk Board & Strip transparency	1,2

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PRACTICALS

S. No.	Practical	Time required (Hrs)	Teaching Method & aid to be employed	Ref.
1.	Construction of Frequency Distribution Tables	2 1/2	Interactive with Calculators	1,2
2.	Computation of Arithmetic Mean for Grouped and Un-grouped data	2 1/2	Interactive with Calculators	1,2
3.	Computation of Median for Grouped and Un-grouped data	2 1/2	Interactive with Calculators	1,2
4.	Computation of Mode for Grouped and Un-grouped data	2 1/2	Interactive with Calculators	1,2
5.	Computation of Standard Deviation and Variance for grouped and un-grouped data	2 1/2	Interactive with Calculators	1,2
6.	Computation of Coefficient of Variation for grouped and un-grouped data	2 1/2	Interactive with Calculators	1,2
7.	SND(Z) test for single sample, Population SD Known and Unknown	2 1/2	Interactive with Calculators	1,2
8.	SND(Z) test for two samples, Population SD Known and Unknown	2 1/2	Interactive with Calculators	1,2
9.	Students t-test for single and two samples	2 1/2	Interactive with Calculators	1,2
10.	Paired t-test and F-test	2 1/2	Interactive with Calculators	1,2
11.	Chi-square test 2x2 contingency Table with Yates correction	2 1/2	Interactive with Calculators	1,2
12.	Computation of Correlation coefficient and its testing	2 1/2	Interactive with Calculators	1,2
13.	Fitting of Simple Regression equations Y on X and X on Y	2 1/2	Interactive with Calculators	1,2
14.	Analysis of Completely Randomized Design: Analysis with equal and unequal replications	2 1/2	Interactive with Calculators	1,2
15.	Analysis of Randomized Block Design	2 1/2	Interactive with Calculators	1,2
16.	Analysis of Latin Square Design	2 1/2	Interactive with Calculators	1,2

REFERENCES

1.	Statistics for Agricultural Sciences-	G. Nageswara Rao 2007 BS Publications, Hyderabad
2.	A Text Book of Agricultural Statistics-	R. Rangaswamy 2000 New Age International Publishing Limited, Hyderabad
1.	Course No.:	AGRO 102
2.	Course Title	DRYLAND FARMING & WATERSHED MANAGEMENT

3.	Credit Hours	2 (1+1)
4.	Semester	Second Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To improve knowledge and skills of UG students in Dryland Agriculture and Watershed Management.
7.	Specific objectives:	-

A.Theory:

By the end of the theory classes the students will be able to:

- i) Understand the importance of dryland farming, water harvesting and storage methods.
- ii) Analyze rainfall of the area, plan water storage methods, plan and identify crop and livestock systems to such areas.
- iii) Know the moisture and soil conservation methods for better production and protection of environment.

B.

Practical:

By the end of the practical classes the students will be able to:

- i) Raise crops under rainfed conditions.
- ii) Evolve methods to alleviate drought by following moisture conservation methods and mid season corrections.
- iii) Recommend methods to harvest and store rainwater. Recommend crops and cropping systems for rainfed areas. Devise methods to increase fertilizer use efficiency of rainfed crops. Estimate yields of rainfed crops.

[TOP](#)

AGRO 102 - DRYLAND FARMING & WATERSHED MANAGEMENT THEORY

Sl. No.	Lesson	Time required (Hrs)	Teaching Methods to be used	Teaching Aid to be used	Ref.
1.	Dryland farming introduction and definition - dimensions of the problem area and production from drylands in India and Andhra Pradesh dry climates and their classifications moisture index semi-arid and arid climates objectives and activities of CRIDA its main and coordinating centers.	1	Interactive Lecture	Chalk Board, Overlay & Picture transparency	1,4,5 & 9
2 & 3.	Problems of crop production in drylands climate rainfall pattern distribution variabilities in rainfall short rainy season high intensity rainfall soil	1	Interactive Lecture	Chalk Board, Pull & Overlay transparency	4,5 & 9

	characteristics soil fertility status soil moisture storage and retention capacity heavy weed infestation and economic conditions of the farmer outlines of management of land and water, the basic resources.				
4.	Existing pattern of land use in low rainfall areas drought definition types and occurrence of drought management strategies for drought mid season correction soil mulch adjusting plant population to limited moisture supply increasing inter row distance thinning plant population.	1	Interactive Lecture	Chalk Board, Pull & Rotating transparency	1,2 & 3
5.	Tillage for dryland crops deep ploughing - setline cultivation year round tillage minimum tillage and zero tillage seeding practices soil crusts and their effect on crop and soils avoiding crust problems.	1	Interactive Lecture	Chalk Board & Window transparency	2,4,5 & 6
6 & 7.	Soil erosion definition losses due to erosion - types of soil and wind erosion nature and extent of wind and water erosion factors effecting erosion universal soil loss equation agronomic measures of soil conservation contour cultivation strip cropping cover cropping.	1	Interactive Lecture	Chalk Board, Pull & Window transparency	2,4,5 & 6
8.	Fertilizer use in dry lands use of organic manures introduction of legumes in crop rotation organic recycling and bio-fertilizer use in dry land agriculture time and method of fertilizer application fertilizer use in relation to moisture conservation.	1	Interactive Lecture	Chalk Board & Picture transparency	2,3,4 & 5
9.	Cropping systems in dry lands inter cropping advantages efficient inter cropping systems in different dry farming regions of Andhra Pradesh choice of crops and varieties.	1	Interactive Lecture	Chalk Board, Strip & Window transparency	2,4,5 & 6
10.	Contingent crop planning for aberrant weather conditions in red and black soils under normal monsoon delayed onset of monsoon normal monsoon followed by long dry spells and early of monsoon.	1	Interactive Lecture	Chalk Board, Pull & Overlay transparency	3,4 & 5
11.	Evapotranspiration measures to reduce evapotranspiration weeding - use of mulches chemicals, windbreaks, shelterbelts.	1	Interactive Lecture	Chalk Board, Pull & Window transparency	2,4,5 & 9
12 & 13.	Watershed management definition of watershed - area of operation of watershed in A.P. Objectives and approaches of watershed Components of watershed development programme land use capability and classification.	1	Interactive Lecture	Chalk Board, Pull & Picture transparency	7 & 8
14 & 15.	Soil and water conservation measures in watershed areas Agronomic measures bund former bunding, furrow ridge and furrow system - interplot water harvesting mechanical measures gully control, level bench terraces contour terracing graded bunds and	1	Interactive Lecture	Chalk Board, Strip & Window transparency	7 & 8

	leveling water harvesting structures farm ponds, check dams percolation tank life saving irrigation problems and prospects under watersheds.				
16	Alternate land use systems advantages agro-forestry use systems alley cropping silvi pastoral systems agri silvi pastoral system agri-horticultural system silvi horticultural system multi purpose forest tree production system.	1	Interactive Lecture	Chalk Board, Pull & Rotating transparency	7 & 8

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PRACTICALS

Sl. No.	Practical	Time required (Hrs)	Teaching Method to be employed	Ref.
1.	Allotment of plots and preparation of seed bed	2	Field exercise	4,6 & 8
2.	Fertilizer application and sowing	2	Field exercise	4,6 & 8
3.	Rainfall analysis and interpretation	2	Lab exercise	Met. Data
4.	Study of dry farming implements	2	Models, laminations & farm implements	Models & Laminations
5.	Study of agronomic measures of soil and moisture conservation.	2	Field exercise	4,6 & 8
6.	Study of mulches and antitranspiration	2	Field exercise	4,6 & 8
7.	Demonstration of land treatments for moisture conservation	2	Field exercise	4,6 & 8
8.	Visit to watershed areas	2	Visit to CRIDA & ICRISAT farms	-
9.	Study of effects of drought on crops	2	Field exercise	4,6 & 8
10.	Study the efficiency of land treatments for moisture conservation	2	Field exercise	4,6 & 8
11.	Collection of biometric data on crop and its interpretation	2	Field exercise	4,6 & 8
12.	Study of erosion problems in field	2	Field exercise	4,6 & 8
13.	Collection of data on temperature and evaporation	2	Field exercise	-
14.	Harvesting, post harvesting operations and record of yield	2	Field exercise	-
15.	Harvesting, post harvesting operations and record of yield	2	Field exercise	-
16.	Harvesting, post harvesting operations and record of yield	2	Field exercise	-

[TOP](#)

REFERENCES

1.	A New Technology for Dryland Farming	ICAR 1970, New Delhi
2.	Crop Production in Dry Regions Vol. I	Amon 1972. Leonard Hill Pub. Co., London
3.	Physiological Aspects of Dryland Farming	Gupta US 1975. Oxford & IBH Publishers Co., Ltd., New Delhi
4.	Dryland Agriculture in India	Mohd Shahid & Mohd. Raza 1987. Rawa Publications, Jaipur
5.	Dryland Farming Perspectives and Prospect	Sharma B L 1991. Daya Publishing House, New Delhi
6.	Dryland Agriculture Status Research in India	Somani L L Vittal K D R & Venkateswarlu B 1992. Scientific Pub. Jodhpur
7.	Watershed Management in India	Murthy JVS 1994. Wiley Eastern Publishers, New Delhi
8.	Watershed Management in India-	Dhruva Narayana V V Sastry G S and Patnaiak V S 1999. ICAR, New Delhi
9.	Principles of Agronomy	Yellamanda Reddy T and Sankar Reddy G H 1994. Kalyani Publishers, Ludhiana

1.	Course No.:	AECO 142
2.	Course Title	AGRICULTURAL FINANCE AND COOPERATION
3.	Credit Hours	2 (1+1)
4.	Semester	Second Semester
5.	Academic level of Entry	Intermediate with EAMCET Rank
6.	General Objective	To acquaint the students with theory and practicals applied in Agriculture
7.	Specific objectives:	-

A.Theory:

By the end of the course the students will be able to:

- i) Understand the financial aspects of different financial institutions like Govt. organization, Commercial Banks, Cooperatives and Regional Rural Banks.
- ii) Understand the functioning of cooperative financial institutions. Cooperative marketing and Principles as well as history of Cooperation.

B.

Practical:

By the end of the practical exercises, the students will be able to:

- i) Visits to various financial institutions and Cooperative Banks.

[TOP](#)

AECO 142 - AGRICULTURAL FINANCE AND COOPERATION THEORY

Sl. No.	Topic/Lesson	Time required (Hrs)	Teaching Method to be used	Teaching method & Aid to be used	Ref.
1.	Agril. Finance Nature, Scope, Meaning, Significance, and definition of Agricultural Finance-Micro and Marco finance.	1	Lecture and assignment	Chalk board & Window Transparency	5,6
2.	Meaning and definition of credit credit needs in Agriculture Classification of credit: Time, Purpose, Security, Lender and Borrower Classification.	1	Brainstorming and lecture	Chalk board & Overlay Transparency	1,3
3.	Credit Analysis: Economic feasibility tests 3Rs 5Cs and 5Ps of credit.	1	Lecture and discussion	Chalk board & Window Transparency	2,5,6
4.	Methods and Mechanics of processing loan applications.	1	Lecture and assignment	Chalk board & Strip Transparency	3,4
5.	Repayment plans: methods:- Lump sum repayment, Straightened repayment, Amortized Even repayment, Amortized Decreasing repayment and Variable or Quasi Variable repayment. .	1	Lecture and assignment	Chalk board & Window Transparency	4,5
6.	Recent trends in Agricultural Finance: Social Control and Nationalization of Banks.	1	Lecture and discussion	Chalk board & Rotating Transparency	5,6
7.	Lead Bank Scheme: Origin, Objectives, Functions and progress.	1	Brainstorming and Lecture	Chalk board & Window Transparency	6
8.	Crop loan system: Objectives importance Scales of finance and estimation Term loans: Objectives and interest rates.	1	Lecture and discussion	Chalk board & Window Transparency	4
9.	Schemes for Financing for Weaker Sections: DIR, IRDP and other schemes.	1	Lecture and discussion	Chalk board & Window Transparency	3,5
10.	Crop insurance: Meaning and its importance advantages progress of crop insurance scheme in India Limitations in application.	1	Brainstorming and Lecture	Chalk board & Rotating Transparency	4,6
11.	Higher Financing Agencies. RBI: Origin, Functions. Role of RBI in Agricultural development and finance.	1	Lecture and discussion	Chalk board & Strip Transparency	5,6
12.	NABARD:- Origin, objective, Function and Activities and its role in Agricultural	1	Lecture and discussion	Chalk board & Strip	5,6

	development.			Transparency	
13.	COOPERATION Meaning, Scope, Importance and Definition of Cooperation Principles, Objectives of cooperation.	1	Brainstorming and Lecture	Chalk board & Strip Transparency	2,3
14.	Origin and history of Indian Cooperative movement. Cooperative Movement during pre-independence period Progress of cooperative movement during post independence period.	1	Lecture and discussion	Chalk board & Rotating Transparency	2,3
15.	Short comings of Indian Cooperative Movement and remedial measure Recommendations of various Committees. Development of Cooperative Credit and non-credit organizations Cooperative Credit Structure.	1	Lecture and discussion	Chalk board & Window Transparency	4,6
16.	Classification of Cooperative Credit Institutions Short term medium term, and long-term credit, Primary Credit Societies, F.S.S., MPCs, and Large Sized Societies: Objectives and Functions. Reorganisation of Rural Credit Delivery System and concept of single window system.	1	Lecture and discussion	Chalk board & Overlay Transparency	1,3

PRACTICALS

S. No.	Practical	Time required (Hrs)	Teaching method & Aid to be used	References
1.	Visit to Ware-housing Corporation or FCI.	2 1/2	Individual Assignment	2,4
2 & 3	Working out Repayment of loans	2 1/2	Group assignment & presentation	1,2
4	Working out Financial test ratios	2 1/2	Individual Assignment	1,2
5 & 6	Visit to Commercial Banks	2 1/2	Group Assignment	5,6
7 & 8	Visit to RRB's & PAC's	2 1/2	Group assignment	5,6
9,10 & 11	Visit to Multipurpose Cooperatives	2 1/2	Individual Assignment	5,6
12 & 13	Visit to PADBS F.S.S. CCBs	2 1/2	Group assignment	1,2
14	Visit to Self Help Group (SHG)	2 1/2	Group assignment & presentation	1,2
15	Visit to Single Window System	2 1/2	Individual Assignment	1,2
16	Practical Final Examination	2 1/2	Individual	-

REFERENCES

1.	Agricultural Finance and Management	Subba Reddy S and Raghuram P 2005. Oxford & IBH Publishing Company, New Delhi.
2.	Agricultural Economics	Subba Reddy S, Raghuram P, Sastry T V N, and Bhavani Devi I, 2006. Oxford & IBH Publishing Company, New Delhi.
3.	Farm Financial Management	Johl S S and Moore C V 1970. Today and tomorrows Publishers, New Delhi.
4.	Agricultural Problems in India	C B Memoria, 1973, Kitab Mahal, Allahabad, UP.
5.	Co-operation in India	Memoria C B and Saxena RD 1973. Kitab Mahal, Allahabad, UP.
6.	Cooperation on India and Abroad	Mukhi H R 1983. New Heights Publishers, New Delhi.