

Program: B.Sc.(Hons.) Agriculture
Semester: Second
Course: Fundamentals of Genetics
Course Code: 13A.151

L	T	P	C
2	0	2	3

Course Objective:

- To understand various theories of heredity, concepts of cell cycle, and application of statistical tools in genetics
- To acquaint with sex determination, sex linkage, mutations and chromosomal aberrations, etc
- To study the concept of central dogma

Unit I:

Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity. Architecture of chromosome; chromonemata, chromosome matrix, chromomeres, centromere, secondary constriction and telomere; special types of chromosomes. Chromosomal theory of inheritance- cell cycle and cell division- mitosis and meiosis. Probability and Chi-square. Dominance relationships, Epistatic interactions with example.

Unit II:

Multiple alleles, pleiotropism and pseudoalleles, Sex determination and sex linkage, sex limited and sex influenced traits, Blood group genetics, Linkage and its estimation, crossing over mechanisms, chromosome mapping. Structural and numerical variations in chromosome and their implications, Use of haploids, dihaploids and doubled haploids in Genetics.

Unit III:

Mutation, classification, Methods of inducing mutations & CIB technique, mutagenic agents and induction of mutation. Qualitative & Quantitative traits, Polygenes and continuous variations, multiple factor hypothesis, Cytoplasmic inheritance. Genetic disorders.

Unit IV:

Nature, structure & replication of genetic material. Protein synthesis, Transcription and translational mechanism of genetic material, Gene concept: Gene structure, function and regulation, Lac and Trp operons.

Practical:

1. Study of microscope.
2. Study of cell structure.
3. Mitosis and Meiosis cell division.
4. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross.
5. Experiments on epistatic interactions including test cross and back cross.
6. Practice on mitotic and meiotic cell division.
7. Experiments on probability and Chi-square test.
8. Determination of linkage and cross-over analysis (through two point test cross and three point test cross data).

9. Study on sex linked inheritance in Drosophila.
10. Study of models on DNA and RNA structures

Suggested Reading:

1. Gupta P.K.2004. *Cytology, Genetics and evolution. Rastogi Publications, Meerut. (Hindi Edition)*
2. Kaushik, M.P.2003. *A text Book of Modern Botany. Prakash publications, Muzaffar nagar(UP)*
3. Klug, W.W.AndCummings, M.R.2005.*Concepts of genetics Pearson Education (Singapore) pvt. Ltd., Indian Branch, Pratap Ganj, New Delhi.*
4. Singh, B.D. 2001.*Kalyani Publishing House, New Delhi.*
5. Strickberger, M.W.2001.*Genetics. Prentice Hall of India. Pvt. Ltd., New Delhi.*
6. Shekhawat, A.S.andTripathi, B.K., 2009. *A practical manual on Element of Genetics. Publish by College of Agriculture, Bikaner*

Program: B.Sc.(Hons.) Agriculture

Semester: Second

Course: Agricultural Microbiology

Course Code: 13A.152

L	T	P	C
1	0	2	2

Course Objective:

- To familiarize with various microbes and their effect on plants
- To demonstrate the indispensable role of microbes in the environment including elemental cycles, bio-degradation, etc.
- To impart knowledge about industrial application of microbes
- To raise awareness of various laboratory techniques in the maintenance of micro- organisms.

Unit I:

Introduction. Microbial world: Prokaryotic and eukaryotic microbes. Bacteria: cell structure, chemoautotrophy, photo autotrophy, growth. Bacterial genetics: Genetic recombination-transformation, conjugation and transduction, plasmids, transposon.

Unit II:

Role of microbes in soil fertility and crop production: Carbon, Nitrogen, Phosphorus and Sulphur cycles.

Unit III:

Biological nitrogen fixation- symbiotic, associative and asymbiotic. Azolla, blue green algae and mycorrhiza. Rhizosphere and phyllosphere.

Unit IV:

Microbes in human welfare: silage production, biofertilizers, biopesticides, biofuel production and biodegradation of agro-waste.

Practical:

1. Introduction to microbiology laboratory and its equipments.
2. Microscope- parts, principles of microscopy, resolving power and numerical aperture.
3. Methods of sterilization.
4. Nutritional media and their preparations.
5. Enumeration of microbial population in soil- bacteria, fungi, actinomycetes.
6. Methods of isolation and purification of microbial cultures.
7. Isolation of Rhizobium from legume root nodule.
8. Isolation of Azotobacter from soil.
9. Isolation of Azospirillum from roots.
10. Isolation of BGA.
11. Staining and microscopic examination of microbes.

Suggested Reading:

1. Biswas, T.D. and Mukherjee, S.K. 1990. *Text Book of Soil Sciences*, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Mukherjee, N. and Ghosh T. 1998. *Agricultural Microbiology*, Kalyani Publishers, New Delhi.
3. Pelczar, Jr. Michel J. Chan, E.C.S. and Krieg, Noel R. 1997. *Microbiology*. Tata McGraw - Hill Edition, 1993. India.
4. Rangaswami, G. and Bagyaraj, D.J. 1993. *Agricultural Microbiology*. Prentice Hall of India Pvt. Limited, New Delhi.
5. Rao, N.S. 2000. *Soil Microbiology*, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
6. Vishnavat, K. and Kolte, S.J. 2005. *Essentials of Phytopathological Techniques*. Kalyani Publishers, New Delhi

Program: B.Sc.(Hons.) Agriculture

Semester: Second

Course: Soil and Water Conservation Engineering

Course Code: 13A.153

L	T	P	C
1	0	2	2

Course Objective:

- To teach about fundamental aspects of soil and water conservation engineering
- To improve the understanding of soil and water dynamics through use of modern technology
- To provide skills for sustainable use and reliability of water resources and improve land productivity by promoting storage.

Unit I:

Soil erosion - Introduction, causes and types - geological and accelerated erosion, agents, factors affecting and effects of erosion. Water erosion - Mechanics and forms - splash, sheet, rill, gully, ravine and stream bank erosion. Gullies - Classification, stages of development.

Unit II:

Soil loss estimation – Universal soil loss equation (USLE) and modified USLE. Rainfall erosivity – estimation by $KE > 25$ and EI methods. Soil erodibility - topography, crop management and conservation practice factors. Measurement of soil erosion - Runoff plots, soil samplers. Water erosion control measures - agronomical measures - contour farming, strip cropping, conservation tillage and mulching.

Unit III:

Engineering measures– Bunds and terraces. Bunds - contour and graded bunds - design and surplussing arrangements. Terraces - level and graded broad base terraces, bench terraces - planning, design and layout procedure, contour stonewall and trenching. Gully and ravine reclamation - principles of gully control - vegetative measures, temporary structures and diversion drains. Grassed waterways and design.

Unit IV:

Wind erosion- Factors affecting, mechanics, soil loss estimation and control measures - vegetative, mechanical measures, wind breaks and shelter belts and stabilization of sand dunes. Land capability classification. Rate of sedimentation, silt monitoring and storage loss in tanks.

Practical:

1. Study of different types and forms of water erosion.
2. Exercises on computation of rainfall erosivity index.
3. Computation of soil erodibility index in soil loss estimation.
4. Determination of length of slope (LS) and cropping practice (CP) factors for soil loss estimation by USLE and MUSLE.
5. Exercises on soil loss estimation/measuring techniques.
6. Study of rainfall simulator for erosion assessment.
7. Estimation of sediment rate using Coshocton wheel sampler and multi-slot devisor.
8. Determination of sediment concentration through oven dry method.

9. Design and layout of contour bunds.
10. Design and layout of graded bunds.
11. Design and layout of broad base terraces.
12. Design and layout of bench terraces.
13. Design of vegetative waterways.
14. Exercises on rate of sedimentation and storage loss in tanks.
15. Computation of soil loss by wind erosion.
16. Design of shelterbelts and wind breaks for wind erosion control.
17. Visit to soil erosion sites and watershed project areas for studying erosion control and water conservation measures.

Suggested Reading:

1. S.R. Reedy. *Irrigation Agronomy*
2. TVS Prasad. *Soil Chemistry Nutrient & Water Management in Agriculture Soil*
3. R. Suresh. *Soil and Water Conservation engineering*
4. *Land and Water Management Engineering*. 1982. Murthy V.V.N. Kalyani Pubhliers, New Delhi.
5. *Irrigation: Theory and Practices*. 1989. Michael A.M. Vikas Publishing House Pvt. Ltd., New Delhi.
6. *Principles of Agricultural. Engineering. Vol. II*. 1993. Michael A.M. and T.P. Ojha. Jain Brothers, New Delhi.

Program: B.Sc. (Hons.) Agriculture

Semester: Second

Course: Fundamentals of Crop Physiology

Course Code: 13A.154

L	T	P	C
1	0	2	2

Course Objective:

- To discuss the developmental responses of plants to environmental factors such as light, gravity and cold temperatures.
- To understand basic principles of plant physiological form and functions as well as processes and its importance in crop production
- To understand the life cycle of plants, from germination through growth and development, to the induction of flowering and the formation of seeds.
- Understand various plant metabolic processes at different stages of plant growth, which lead to development.

Unit I:

Introduction to crop physiology and its importance in Agriculture; Plant cell: an Overview; Diffusion and osmosis; Absorption of water, transpiration and Stomatal Physiology;

Unit II:

Mineral nutrition of Plants: Functions and deficiency symptoms of nutrients, nutrient uptake mechanisms; Photosynthesis: Light and Dark reactions, C3, C4 and CAM plants;

Unit III:

Respiration: Glycolysis, TCA cycle and electron transport chain; Fat Metabolism: Fatty acid synthesis and Breakdown;

Unit IV:

Plant growth regulators: Physiological roles and agricultural uses, Physiological aspects of growth and development of major crops: Growth analysis, Role of Physiological growth parameters in crop productivity.

Practical:

1. Study of plant cells.
2. Structure and distribution of stomata.
3. Imbibitions, osmosis, plasmolysis.
4. Measurement of root pressure, rate of transpiration.
5. Separation of photosynthetic pigments through paper chromatography
6. Rate of transpiration,
7. Photosynthesis
8. Respiration
9. Tissue test for mineral nutrients,
10. Estimation of relative water content.

11. Measurement of photosynthetic CO₂ assimilation by Infra Red Gas Analyser (IRGA).

Suggested Reading:

1. S.N.Pandey. *Plant Physiology*
2. H.S. Srivastava. *Plant Physiology*
3. N.K. Gupta & Sunita Gupta, 2004. *Plant Physiology. Oxford & IBH Publication, New Delhi*
4. R.L. Agarwal, 1995. *Seed Technology, Oxford & IBH Publication, New Delhi*
5. G.R. Noggle and G.J. Fritz, 1986. *Plant Physiology, Prentic Hall of India Pvt. Ltd.*
6. J.B. Salisbury and C.W. Ross (1992). *Plant Physiology, Wadswar Publishing Company, Belmont, California*

Program: B.Sc. (Hons.) Agriculture

Semester: Second

Course: Fundamentals of Agricultural Economics

Course Code: 13A.155

L	T	P	C
2	0	0	2

Course Objective:

- To provide knowledge on basic concepts and principles necessary for economic analysis in Agriculture sector
- To provide awareness on general economic environment under which individual, firm, government, and other economic units operate.
- To familiarize with the basis for rational economic decision

Unit I:

Economics: Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macro economics, positive and normative analysis. Nature of economic theory; rationality assumption, concept of equilibrium, economic laws as generalization of human behavior. Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development. Agricultural planning and development in the country.

Unit II:

Demand: meaning, law of demand, schedule and demand curve, determinants, utility theory; law of diminishing marginal utility, equi-marginal utility principle. Consumer's equilibrium and derivation of demand curve, concept of consumer surplus. Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity. Production: process, creation of utility, factors of production, input output relationship. Laws of returns : Law of variable proportions and law of returns to scale.

Unit III:

Cost: concepts, short run and long run cost curves. Supply: Stock v/s supply, law of supply, schedule, supply curve, determinants of supply, elasticity of supply. Market structure: meaning and types of market, basic features of perfectly competitive and imperfect markets. Price determination under perfect competition; short run and long run equilibrium of firm and industry, shut down and break even points. Distribution theory: meaning, factor market and pricing of factors of production. Concepts of rent, wage, interest and profit. National income: Meaning and importance, circular flow, concepts of national income accounting and approaches to measurement, difficulties in measurement. Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programmes on population control.

Unit IV:

Money: Barter system of exchange and its problems, evolution, meaning and functions of money, classification of money, supply, general price index, inflation and deflation. Banking: Role in modern economy, types of banks, functions of commercial and central bank, credit creation policy. Agricultural

and public finance: meaning, micro v/s macro finance, need for agricultural finance, public revenue and public expenditure. Tax: meaning, direct and indirect taxes, agricultural taxation, VAT. Economic systems: Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning.

Suggested Reading:

1. *K.K. Dewett and J.D. Verma (1986) Elementary Economic Theory, S.Chand & Company, New Delhi*
2. *P.A. Samuelson & W.D. Nordhaus (1987) Economics, McGraw-Hill, Singapore*
3. *S.K. Mishra and V.K. Puri (1996) Indian Economy, Himalaya Publishing House, New Delhi*
4. *G.B. Jathar and S.G. Beri (1996) Elementary Principles of Economics, Oxford University Press (10th Edition), Delhi*
5. *Berkeley Hill (1980) An Introduction to Economics for students of agriculture, Pergaman Press, Oxford*

Program: B.Sc. (Hons.) Agriculture

Semester: Second

Course: Fundamentals of Plant Pathology

Course Code: 13A.156

L	T	P	C
3	0	2	4

Course Objective:

- To introduce to the basic principles and concepts of plant pathology.
- To introduce and illustrate the major groups of organisms that causes plant diseases.i.e. fungi, bacteria, virus, nematodes, etc. and various pesticides and their application methods.
- To develop laboratory skills in maintaining the cultures, sampling techniques, staining techniques, etc

Unit I:

Introduction: Importance of plant diseases, scope and objectives of Plant Pathology. History of Plant Pathology with special reference to Indian work. Terms and concepts in Plant Pathology. Pathogenesis. Causes / factors affecting disease development: disease triangle and tetrahedron and classification of plant diseases. Important plant pathogenic organisms, different groups: fungi, bacteria, fastidious vesicular bacteria, phytoplasmas, spiroplasmas, viruses, viroids, algae, protozoa, phanerogamic parasites and nematodes with examples of diseases caused by them. Diseases and symptoms due to abiotic causes.

Unit II:

Fungi: general characters, definition of fungus, somatic structures, types of fungal thalli, fungal tissues, modifications of thallus, reproduction (asexual and sexual). Nomenclature, Binomial system of nomenclature, rules of nomenclature, classification of fungi. Key to divisions, sub-divisions, orders and classes.

Unit III:

Bacteria and mollicutes: general morphological characters. Basic methods of classification and reproduction. Viruses: nature,structure, replicationand transmission. Study of phanerogamic plant parasites. Nematodes:General morphology and reproduction, classification, symptoms and nature of damage caused by plant nematodes (Heterodera, Meloidogyne, Anguina, Radopholus etc.)

Unit IV:

Growth and reproduction of plant pathogens. Liberation / dispersal and survival of plant pathogens. Types of parasitism and variability in plant pathogens. Pathogenesis. Role of enzymes, toxins and growth regulators in disease development. Defense mechanism in plants. Epidemiology: Factors affecting disease development. Principles and methods of plant disease management. Nature, chemical combination, classification, mode of action and formulations of fungicides and antibiotics.

Practical:

1. Acquaintance with various laboratory equipments and microscopy.

2. Collection and preservation of disease specimen.
3. Preparation of media, isolation and Koch's postulates.
4. General study of different structures of fungi.
5. Study of symptoms of various plant diseases.
6. Study of representative fungal genera.
7. Staining and identification of plant pathogenic bacteria.
8. Transmission of plant viruses.
9. Study of phanerogamic plant parasites.
10. Study of morphological features and identification of plant parasitic nematodes.
11. Sampling and extraction of nematodes from soil and plant material
12. Preparation of nematode mounting.
13. Study of fungicides and their formulations.
14. Methods of pesticide application and their safe use.
15. Calculation of fungicide sprays concentrations.

Suggested Reading:

1. *Agrios, G.N. 1996. Plant Pathology, Academic Press, New Delhi.*
2. *Alexopolus, C.J., Mims, C.W. and Blackwell, M. 1996. Introductory Mycology, John Wiley Eastern Private Limited, New York.*
3. *Mehrotra, R.S. and Aggarawal, A. 2007. Plant Pathology. Tata McGraw Hill Publishing Co. Ltd., New Delhi.*
4. *Singh, R.S. 1996. An Introduction to Principles of Plant Pathology. Oxford & IBH, New Delhi.*
5. *Nene Y.L. and Thapliyal, P.N. 1993. Fungicides in Plant Diseases Control. 3rd Edn. Oxford & IBH published Co. Pvt. Ltd., New Delhi.*

Program: B.Sc. (Hons.) Agriculture

Semester: Second

Course: Fundamentals of Agricultural Extension Education

Course Code: 13A.157

L	T	P	C
2	0	2	3

Course Objective:

- To familiarize with the concepts of extension education, various extension/agriculture development programs, and new trends in agricultural extension education
- To create awareness on concepts of rural development, Agricultural journalism, usage/application of various aids of communication

Unit I:

Education: Meaning, definition & Types; Extension Education- meaning, definition, scope and process; objectives and principles of Extension Education; Extension Programme planning- Meaning, Process, Principles and Steps in Programme Development. Extension systems in India: extension efforts in pre-independence era (Sriniketan, Marthandam, Firka Development Scheme, Gurgaon Experiment, etc.) and post-independence era (Etawah Pilot Project, Nilokher Experiment, etc.);

Unit II:

Various extension/ agriculture development programmes launched by ICAR/ Govt. of India (IADP, IAAP, HYVP, KVK, IVLP, ORP, ND,NATP, NAIP etc.). New trends in agriculture extension: privatization extension, cyber extension/ e-extension, market-led extension, farmer-led extension, expert systems, etc.

Unit III:

Rural Development: concept, meaning, definition; various rural development programmes launched by Govt. of India. Community Dev.-meaning, definition, concept & principles, Philosophy of C.D. Rural Leadership: concept and definition, types of leaders in rural context; extension administration: meaning and concept, principles and functions. Monitoring and evaluation: concept and definition, monitoring and evaluation of extension programmes; transfer of technology: concept and models, capacity building of extension personnel.

Unit IV:

Extension teaching methods: meaning, classification, individual, group and mass contact methods, ICT Applications in TOT (New and Social Media), media mix strategies; communication: meaning and definition; Principles and Functions of Communication, models and barriers to communication. Agriculture journalism; diffusion and adoption of innovation: concept and meaning, process and stages of adoption, adopter categories.

Practical:

1. To get acquainted with university extension system.
2. Group discussion- exercise;
3. Handling and use of audio visual equipments and digital camera and LCD projector
4. Preparation and use of AV aids

5. Preparation of extension literature – leaflet, booklet, folder, pamphlet news stories and success stories
6. Presentation skills exercise; micro teaching exercise
7. A visit to village to understand the problems being encountered by the villagers/ farmers
8. To study organization and functioning of DRDA and other development departments at district level
9. Visit to NGO and learning from their experience in rural development
10. Understanding PRA techniques and their application in village development planning
11. Exposure to mass media: visit to community radio and television studio for understanding the process of programme production;
12. Script writing, writing for print and electronic media, developing script for radio and television.

Suggested Reading:

1. *Dhama, O.P. & Bhatnagar, O.P. 1985. Education and Communication for Development, Oxford & IBH Publishing Co. New-Delhi.*
2. *Kelsey, L.D. & Hearne, C.C. 1963. Cooperative Extension Work: Cornell University Press, New York, USA.*
3. *Ray, G.L. 2003. Extension Communication and Management, Naya Prakash, 206 Bidhan Sarni, Calcutta-6.*
4. *Reddy, A.A. 1993. Extension Education, Shri Laxmi Press, Bapatla.*

Program: B.Sc. (Hons.) Agriculture
Semester: Second
Course: Fundamentals of Entomology
Course Code: 13A.158

L	T	P	C
3	0	2	4

Course Objective:

- Understand anatomical, morphological, physiological and taxonomical characters of insects and would be in a condition to identify agriculturally important insects
- To get trained in collection and preservation of insects
- Know the influence of ecological factors on insect development/distribution and understand the components of integrated pest management
- To get acquainted with various types of chemical/botanical/ biological insecticides
- To gain proficiency in mass multiplication of various bio-agents/bio-pesticides
- To understand about non-insect pests and their management

Unit I:

History of Entomology in India. Major points related to dominance of Insecta in Animal kingdom. Classification of phylum Arthropoda upto classes. Relationship of class Insecta with other classes of Arthropoda. Morphology: Structure and functions of insect cuticle and molting. Body segmentation. Structure of Head, thorax and abdomen. Structure and modifications of insect antennae, mouth parts, legs, Wing venation, modifications and wing coupling apparatus. Structure of male and female genital organ. Metamorphosis and diapause in insects. Types of larvae and pupae. Structure and functions of digestive, circulatory, excretory, respiratory, nervous, secretary (Endocrine) and reproductive system, in insects. Types of reproduction in insects. Major sensory organs like simple and compound eyes, chemoreceptor.

Unit II:

Insect Ecology: Introduction, Environment and its components. Effect of abiotic factors—temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents. Effect of biotic factors – food competition, natural and environmental resistance.

Unit III:

Categories of pests. Concept of IPM, Practices, scope and limitations of IPM. Classification of insecticides, toxicity of insecticides and formulations of insecticides. Chemical control-importance, hazards and limitations. Recent methods of pest control, repellents, anti feed ants, hormones, attractants, gamma radiation. Insecticides Act 1968- Important provisions. Application techniques of spray fluids. Symptoms of poisoning, first aid and antidotes.

Unit IV:

Systematics: Taxonomy –importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order. Classification of class Insecta upto Orders, basic groups of present day insects with special emphasis to orders and families of Agricultural importance like Orthoptera: Acrididae, Tettigonidae, Gryllidae, Gryllotalpidae; Dictyoptera: Mantidae, Blattidae; Odonata; Isoptera: Termitidae; Thysanoptera: Thripidae; Hemiptera: Pentatomidae, Coreidae,

Cimicidae, Pyrrhocoridae, Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidae, Aleurodidae, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera: Pieridae, Papilionidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidae, Bruchidae, Scarabaeidae; Hymenoptera: Tenthredinidae, Apidae. Trichogrammatidae, Ichneumonidae, Braconidae, Chalcididae; Diptera: Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae, Muscidae, Tephritidae.

Practical:

1. Methods of collection and preservation of insects including immature stages;
2. External features of Grasshopper/Blister beetle
3. Types of insect antennae
4. Types of insect mouthparts
5. Types of insect legs
6. Wing venation, types of wings and wing coupling apparatus.
7. Types of insect larvae and pupae;
8. Dissection of digestive system in insects (Grasshopper);
9. Dissection of male and female reproductive systems in insects (Grasshopper)
10. Study of characters of orders Orthoptera, Dictyoptera, Odonata, Isoptera, Thysanoptera, Hemiptera, Lepidoptera, Neuroptera, Coleoptera, Hymenoptera, Diptera and their families of agricultural importance.
11. Insecticides and their formulations.
12. Pesticide appliances and their maintenance.
13. Sampling techniques for estimation of insect population and damage.

Suggested Reading:

1. Nayar. K.K, Ananthakrishnan .T.N. and David. B.V. 1976. *General and Applied Entomology*. McGraw Hill publishing Co. Ltd. New Delhi. 24
2. Richards O.W. and Davies R.G. 1977. *Imm's General Text Book of Entomology, Vol. I & II*. Chapman and Hall, London.
3. Pant. N.C. and Ghai, S. 1981. *Insect Physiology and Anatomy*, ICAR, New Delhi.
4. Chapman .R.F.1974. *Insect Structure and Function*, ELBS Publishers New Delhi.
5. Snodgrass.R.E .2001. *Principles of Insect Morphology*.
6. Mathur and Upadhyay, 2000. *A Text Book of Entomology*, Aman Publishing House, Meerut.

Program: B.Sc. (Hons.) Agriculture

Semester: Second

Course: Communication skills and personality development

Course Code: 40B.152

L	T	P	C
1	0	2	2

Course Objective:

- Listen to understand, not to just reply only.
- Be brief, speak less and avoid unnecessary conversation fillers.
- Avoid any and all distractions.
- Never be biased or judgmental during the conversation.
- Learn to know targeted audience and tailor your message accordingly.
- Can use stories and examples to ensure better understanding.
- Appropriate use of body language. Can attempt to resolve conflicts than to instigate one.

Unit I:

Communication Skills: Structural and functional grammar; meaning and process of communication, verbal and nonverbal communication;

Unit II:

Listening and note taking, writing skills, oral presentation skills; field diary and lab record; Indexing, footnote and bibliographic procedures.

Unit III:

Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations, impromptu presentation, public speaking;

Unit IV:

Group discussion. Organizing seminars and conferences.

Practical:

1. Listening and note taking
2. Writing skills,
3. Oral presentation skills;
4. Field diary and lab record;
5. Indexing, footnote and bibliographic procedures.
6. Reading and comprehension of general and technical articles,
7. Precise writing,
8. Summarizing, abstracting;
9. Individual and group presentations.

Suggested Reading:

1. *Agricultural Communication- A reference Manual (FAO)- B.E. Swanson et al*
2. *Development Communication for Agriculture- R.K. Samantha*

Program: B.Sc.(Hons.) Agriculture

Semester: Second

Course: NSS/ Physical Education & Yoga Practices

Course Code: 13AP.117

L	T	P	C
0	0	4	0

NSS

Unit I:

Importance and role of youth leadership

Meaning, types and traits of leadership, qualities of good leaders; importance and roles of youth leadership

Life competencies

Definition and importance of life competencies, problem-solving and decision-making, inter personal communication

Unit II:

Youth development programmes

Development of youth programmes and policy at the national level, state level and voluntary sector; youth-focused and youth-led organizations

Unit III:

Health, hygiene and sanitation

Definition needs and scope of health education; role of food, nutrition, safe drinking water, water born diseases and sanitation (Swachh Bharat Abhiyan) for health; national health programmes and reproductive health.

Unit IV:

Youth health, lifestyle, HIV AIDS and first aid

Healthy lifestyles, HIV AIDS, drugs and substance abuse, home nursing and first aid

Youth and yoga

History, philosophy, concept, myths and misconceptions about yoga; yoga traditions and its impacts, yoga as a tool for healthy lifestyle, preventive and curative method

Physical Education and Yoga Practices

Unit I:

1. Teaching of skills of Hockey – demonstration practice of the skills and correction.
2. Teaching of skills of Hockey – demonstration practice of the skills and correction. And involvement of skills in games situation
3. Teaching of advance skills of Hockey – demonstration practice of the skills and correction. Involvement of all the skills in games situation with teaching of rules of the game
4. Teaching of skills of Kho-Kho – demonstration practice of the skills and correction.
5. Teaching of skills of Kho-Kho – demonstration practice of the skills and correction. Involvement of the skills in games situation

Unit II:

6. Teaching of advance skills of Kho-Kho – demonstration practice of the skills and correction. Involvement of all the skills in games situation with teaching of rules of the game
7. Teaching of different track events – demonstration practice of the skills and correction.
8. Teaching of different track events – demonstration practice of the skills and correction.
9. Teaching of different track events – demonstration practice of the skills and correction with competition among them.
10. Teaching of different field events – demonstration practice of the skills and correction.

Unit III:

11. Teaching of different field events – demonstration practice of the skills and correction.
12. Teaching of different field events – demonstration practice of the skills and correction.
13. Teaching of different field events – demonstration practice of the skills and correction with competition among them.
14. Teaching of different asanas – demonstration practice and correction.
15. Teaching of different asanas – demonstration practice and correction.

Unit IV:

16. Teaching of different asanas – demonstration practice and correction.
17. Teaching of different asanas – demonstration practice and correction.
18. Teaching of weight training – demonstration practice and correction.
19. Teaching of circuit training – demonstration practice and correction.
20. Teaching of calisthenics – demonstration practice and correction.