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**B.Sc. (Hons.) Agriculture (Four year program)**

**Proposed Teaching and Examination Scheme(2015-16**

**Year: I Semester: I**

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| **S. No.** | **Course Code** | **Course Category** | **Course Name** | **Credits** | **Contact Hrs/Wk.** | | |
| **L** | **T** | **P** |
| 1. | EN-103 | UC | English | 3 | 3 | 0 | 0 |
| 2. | CP-103 | UC | Introduction to Computer Applications | 2 | 2 | 0 | 0 |
| 3. | SOC-111 | UC | Fundamentals of Rural Sociology and Educational Psychology | 2 | 2 | 0 | 0 |
| 4. | EM-101 | UC | Employability Skills | 1 | 1 | 0 | 0 |
| 5. | PCA-101 | UC | Proficiency in Co-curricular Activities | 2 | - | - | - |
| 6. | MA-121 | UC | Mathematical Methods in Agriculture  (For students from Bio Stream)  Or  Elementary Biology (Botany and Zoology)  (For students from Maths Stream) | 3  3 | 3  3 | 0  0 | 0  0 |
| 7. | EN-161 | UC | English Communication Lab | 1 | 0 | 0 | 2 |
| 8. | CP-161 | UC | Computer Lab | 1 | 0 | 0 | 2 |
| 9. | AG-101 | PC | Plant Biochemistry | 2 | 2 | 0 | 0 |
| 10. | AG-103 | PC | Principles of Agronomy and Agricultural Meteorology | 2 | 2 | 0 | 0 |
| 11. | AG-105 | PC | Introduction to Soil Science | 2 | 2 | 0 | 0 |
| 12. | AG-151 | PC | Plant Biochemistry Lab | 1 | 0 | 0 | 2 |
| 13. | AG-153 | PC | Agronomy and Agricultural Meteorology Lab | 1 | 0 | 0 | 2 |
| 14. | AG-155 | PC | Soil Science Lab | 1 | 0 | 0 | 2 |
|  |  |  | **Total** | **24** | **17** | **0** | **10** |

C = Credit UC = University Core

L = Lecture PC = Program Core

T = Tutorial UE = University Elective

P = Practical PE = Program Elective

**B.Sc. (Hons.) Agriculture (Four year program)**

**Proposed Teaching and Examination Scheme**

**Year: I Semester: II**

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| **S. No.** | **Course Code** | **Course Category** | **Course Name** | **Credits** | **Contact Hrs/Wk.** | | |
| **L** | **T/S** | **P** |
| 1. | ES-101 | UC | Environmental Studies | 2 | 2 | 0 | 0 |
| 2. | EM-102 | UC | Employability Skills-II | 1 | 1 | 0 | 0 |
| 3. | PCA-102 | UC | Proficiency in Co-curricular Activities | 2 | - | - | - |
| 4. | AG-102 | PC | Principles of Genetics | 2 | 2 | 0 | 0 |
| 5. | AG-104 | PC | Fundamentals of Soil and Water Conservation Technology | 2 | 2 | 0 | 0 |
| 6. | AG-106 | PC | Principles of Agricultural Economics | 2 | 2 | 0 | 0 |
| 7. | AG-108 | PC | Soil Fertility, Soil Chemistry and Nutrient Management | 2 | 2 | 0 | 0 |
| 8. | AG-110 | PC | Principles of Plant Pathology and Pathogens | 3 | 3 | 0 | 0 |
| 9. | AG-112 | PC | Insect Morphology and Systematics | 2 | 2 | 0 | 0 |
| 10. | AG-114 | PC | Livestock Production and Management (Animal Production) | 2 | 2 | 0 | 0 |
| 11. | AG-152 | PC | Genetics Lab | 1 | 0 | 0 | 2 |
| 12. | AG-154 | PC | Soil Management Lab | 1 | 0 | 0 | 2 |
| 13. | AG-156 | PC | Plant Pathology and Pathogens Lab | 1 | 0 | 0 | 2 |
| 14. | AG-158 | PC | Insect Morphology Lab | 1 | 0 | 0 | 2 |
| 15. | AG-160 | PC | Livestock Production and Management Lab | 1 | 0 | 0 | 2 |
|  |  |  | **Total** | **25** | **18** | **0** | **10** |

C = Credit UC = University Core

L = Lecture PC = Program Core

T = Tutorial UE = University Elective **(Dr. T.C. Bansal)**

P = Practical PE = Program Elective **Convener, BoS**

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| **AG-101** | | **Plant Biochemistry** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **CONCEPT OF BIOCHEMISTRY** | |
| Biomolecules (The primordial biomolecules, the origin of biomolecules, the fitness of biomolecules, Hierarchy of Biomolecules) Discovery and structure of ATP, Hydrolysis of ATP and role of ATP in Biological reactions | | | |
| **Unit- II** | | **BIOMOLECULES (Carbohydrate)** | |
| **Carbohydrates**- Simple sugars, reducing and non-reducing sugars. Classification into monosaccharides, oliogsacharides and polysaccharides. Mutarotation and inversion. | | | |
| **Unit-III** | **BIOMOLECULES** (**Lipids**) | | |
| **Lipids**– Classification and structure of lipids, Fatty acids- saturated and unsaturated, triacyl glycerols, phospholipids and sphingolipids, Fatty acids biosynthesis, Oxidation of fatty acids | | | |
| **Unit-IV** | | | **BIOMOLECULES** (**Nucleic acid)**- |
| Bases, Nucleoside and Nucleotide, Phosphodiester bonds, Hydrogen bonding. DNA structure: DNA double helix (Watson and Crick model), Super-coiling, Properties of DNA, Denaturation, Structure of t-RNA | | | |
| **Unit-V** | | | **BIOMOLECULES (Proteins)** |
| **Proteins**- Structure and classification of amino acids based on polarity, Zwitter ion nature; properties of amino acids, Peptide bond formation, Classification and Structure of proteins (Primary, secondary, tertiary and quaternary) Conformation and Denaturation | | | |
| **Reference books** | | | 1. Berg, JM., Tymoczko, J.L., Stryer, L. 2006, ***Biochemistry 6th Edition***, W.H. Freeman and Company, New York. 2. Buchanan, B., Gruissem, W. and Jones, R. 2000 ***Biochemistry and Molecular Biology of Plants***  American Society of Plant Biologists. 3. Conn, E.E., Stumpf, P.K. and Bruening, G. 2006 ***Outlines of Biochemistry*** ***4th Edition,*** John Wiley and Sons Inc. 4. Donald Voet, Judith.G. Voet and Charlotte W. Pratt (2006) ***Fundamentals of Biochemistry***, 2nd Edition, John Wiley and Sons Inc. 5. Elliot 2009 ***Biochemistry and Molecular Biology*** Oxford Publishers. 6. Harper, 2003, ***Biochemistry,*** McGrawHill. 7. Keith Wilson and John Walker 2005 ***Principles and Techniques of Biochemistry and Molecular Biology(6th Edition)***, Cambridge University Press, USA 8. Nelson, D.L., Cox, M.M. 2004 ***Lehninger Principles of Biochemistry, 4th edition***, W.H. Freeman and Company, New York, USA. 9. Stryer, L., 2002, ***Biochemistry***, W.H. Freeman. 10. Voet & Voet, 2000, ***Biochemistry***, John Wiley, New York |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-103** | | **Principles of Agronomy and Agricultural Meteorology** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **Agronomy** | |
| Meaning and scope of Agronomy: National and International Agricultural Research Institutes located in India, Agro-climatic zones of India. | | | |
| **Unit- II** | | **Crop rotation** | |
| Crop rotation principles and advantages, cropping pattern, cropping schemes, multiple cropping and mixed cropping principles and advantages, intercropping types and advantages and assessment. Relay cropping, paira cropping and crop interactions. | | | |
| **Unit-III** | **Classification of crops** | | |
| Classification of crops. Crop growth and development, and factors affecting yield. Crop stand establishment, planting geometry and its effect on growth and yield. Selection of seed, sowing methods | | | |
| **Unit-IV** | | | **Agricultural meteorology** |
| Agricultural meteorology: Weather and climate, micro-climate, weather elements, Earths’ atmosphere, Composition and structure, solar radiation, Nature, properties, depletion, solar constant and energy balance, Atmospheric, temperature, factors affecting, horizontal and vertical distribution, variations, | | | |
| **Unit-V** | | | **Climate change** |
| climate change : causes, effect on ecosystem , crop production ,remedial measures and global warming, Air Pressure variations; Wind: factors affecting, cyclones and anticyclones and general circulation, Atmospheric humidity, vapour pressure and saturation, Process of condensation, formation of dew, fog, mist, snow, rain and hail | | | |
| **Reference books** | | | 1. Agrometeorology and remote sensing - D.D. Sahu 2. Principles of Agronomy - T.Y. Reddy and G. H. SankarReddi 3. Principles of Agronomy - S. R. Reddy 4. The Nature and Properties of Soil - N.C.Brady and Ray R. Weil 5. Text book of Agricultural Meteorology - Edited by M.C. Varshney 6. Introduction to Agrometeorology - H.S.Mavi 7. Crops and Weather – S. Venkataraman and A. Krishnan (ICAR) |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-105** | | **Introduction to Soil Science** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **Soil** | |
| Soil : Pedological and edaphological concepts, Origin of the earth, Earth’s crust: Composition: Rocks and minerals, Weathering, soil formation factors and processes, components of soils, Soil profile. | | | |
| **Unit- II** | | **Soil physical properties** | |
| Soil physical properties, soil texture, textural classes, particle size analysis, soil structure, classification, soil aggregates, significance, soil consistency, soil crusting, Bulk density and particle density of soils & porosity, their significance and manipulation, soil compaction. | | | |
| **Unit-III** | **Soil colour** | | |
| Soil colour, elementary knowledge of soil classification and soils of India; soil water, Retention and potentials, soil moisture constants, movement of soil water, Infiltration, Percolation, Permeability, Drainage, Methods of determination of soil moisture. | | | |
| **Unit-IV** | | | **Thermal properties of soil** |
| Thermal properties of soil, soil temperature, Soil air, Gaseous exchange, influence of soil temperature and air on plant growth; Soil colloids, properties, Nature, Types & significance; Layer silicate clays, their genesis and sources of charges, adsorption of ions, ion exchange, CEC and AEC ,factors influencing ion exchange and its significance. | | | |
| **Unit-V** | | | **Soil organic matter** |
| Soil organic matter, composition, decomposability, Humus, Fractionation of organic matter, carbon cycle, C:N ratio, Soil biology, Biomass, Soil Organisms & their beneficial & harmful roles. | | | |
| **Reference books** | | | 1. The nature and properties of soils-N.C.Brady and Ray R.Weil 2. A text book of Soil Science – T.D. Biswas& S.K. Mukherjee 3. Fundamentals of Soil Science – Indian Society of Soil Science 4. Conception,Application of Pedology – J.L. Sehgal 5. Soil Physics – B.P.Ghildyal and R.P.Tripathy 6. Introduction to soil Physics –D. Hillel |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-102** | | **Principles of Genetics** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **historical development in genetics** | |
| Definition, significance and historical development in genetics. Mendel’s principles of heredity, deviation from Mendelian inheritance, pleiotropy, threshold characters, co-dominance | | | |
| **Unit- II** | |  | |
| Chromosome theory of inheritance, gene interaction: modification of monohybrid and dihybrid ratios. Multiple alleles, quantitative inheritance, linkage and crossing over, sex linked inheritance and characters | | | |
| **Unit-III** |  | | |
| Structure of DNA and its replication. Evidences to prove DNA as genetic material. Mutation and its classification. | | | |
| **Unit-IV** | | |  |
| Chromosomal aberrations: Changes in chromosome structure and number Genetic Code ,Transcription and Translation | | | |
| **Unit-V** | | |  |
| Microbial genetics- conjugation, Transformation, Transudation | | | |
| **Reference books** | | | 1. Gupta P K 1999 Cytogenetics Rastogi Publishers, Meerut 2. Lewin, B2005 Genes IX Oxford University Press, New York 3. Phundan Singh 1995Elements of genetics Kalyani Publishers, Ludhiana 4. Prasad, G. 1989 Introduction to Cytogenetics Kalyani Publishers, Ludhiana 5. Strickberger, M.W. 1996. Genetics(3rd edn.). Mac Millan Publishing Co., New Delhi 6. Swanson, C.P., Merz, T. and Young, J.1975 Cytogenetics Prentice Hall of India Private 7. Limited, New Delhi 8. Winchester A M 1967 Genetics (3 rd edn )Oxford and IBH Publishing Co New Delhi |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-104** | | **Fundamentals of Soil and Water Conservation Technology** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **Surveying** | |
| Surveying: survey equipment, chain survey, cross staff survey, plotting procedure, calculations of area of regular and irregular fields. Levelling - levelling equipment, terminology, methods of calculation of reduced levels | | | |
| **Unit- II** | | **Types of levelling,** | |
| Types of levelling, contouring. Irrigation, classification of projects, flow irrigation and lift irrigation. Water source, Water lifting devices - pumps (shallow and deep well), capacity, power calculations. | | | |
| **Unit-III** | **Irrigation water measurement-** | | |
| Irrigation water measurement- weirs, flumes and orifices and methods of water measurement and instruments. | | | |
| **Unit-IV** | | | **Water conveyance systems** |
| Water conveyance systems, open channel and underground pipeline. Irrigation methods - drip and sprinkle irrigation systems. | | | |
| **Unit-V** | | | **Soil and water conservation** |
| Soil and water conservation - soil erosion, types and engineering control measures. | | | |
| **Reference books** | | | 1. A Text Book of Surveying and Levelling – P.C. Purnima  2. Land & Water Management Engineering – V.V.N. Murty  3. Soil Erosion and Conservation – R.P. Tripathy and H.P. Singh |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-106** | | **Principles of Agricultural Economics** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **Introduction to economic** | |
| Introduction to economic theory: Micro Economics: Definition, subject matter, division of economics, scope and importance of economics. Basic terms and concepts used in economics. | | | |
| **Unit- II** | | **Demand theory** | |
| Demand theory : Characteristics of human wants, classification of wants, law of diminishing marginal utility, law of equi-marginal utility, consumer’s surplus, meaning and kinds of demand, law of demand, elasticity of demand and measurement of elasticity of demand. Production and supply | | | |
| **Unit-III** | **Nature and factors of production** | | |
| Nature and factors of production, meaning, importance and characteristics of land, meaning and characteristics of labour, labour efficiency, importance of capital, capital formation, stags of capital formation. Organization: Importance and functions of entrepreneur, different forms of business organization definition, meaning and law of supply | | | |
| **Unit-IV** | | | **Market** |
| Market: Characteristics of perfect and various imperfect markets, equilibrium conditions of firm, price determination under perfect competition. Macro economics: concepts, importance and measurement of national income. Inflation: Kinds of inflation, causes and consequences of inflation and role of monetary and fiscal policy to check inflation. | | | |
| **Unit-V** | | | **Public finance** |
| Public finance: meaning of public finance, distinction between public and private finance, importance and functions of public finance, sources of govt. finance. Public expenditure: classification of public expenditure, principles of public expenditure, importance and role of public expenditure on economy. | | | |
| **Reference books** | | | 1. Elementary economic theory - K.K. Dewett and J.D. Verma  2. International Economics - B. Mishra  3. Fundamentals of Agricultural Economics - A.N. Sadhu and A. Singh  4. Economics - Paul A. Samelson and W.D. Nordhans |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-108** | | **Soil Fertility, Soil Chemistry and Nutrient Management** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **Soil as a source of plant nutrients** | |
| Soil as a source of plant nutrients. Essential and beneficial elements, criteria of essentiality, forms of nutrients in soil , mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants. Measures to overcome deficiencies and toxicities | | | |
| **Unit- II** | | **Problem soils** | |
| Problem soils – acid, salt affected and calcareous soils, characteristics, nutrient availabilities. Reclamation – mechanical, chemical and biological methods. Fertilizer and insecticides and their effect on soil water and air. Irrigations water – Quality of irrigation water and its appraisal. Indian standards for water quality. | | | |
| **Unit-III** | **Different approaches for soil fertility evaluation** | | |
| Use of saline water for agriculture. Soil fertility – Different approaches for soil fertility evaluation. Methods, Soil testing – Chemical methods. critical levels of different nutrients in soil. Plant analysis – DRIS methods, critical levels in plants. | | | |
| **Unit-IV** | | | **Rapid tissue tests** |
| Rapid tissue tests. Indicator plants. Biological method of soil fertility evaluation. Soil test based fertilizer recommendations to crops. | | | |
| **Unit-V** | | | **Factors influencing nutrient use efficiency** |
| Factors influencing nutrient use efficiency (NUE) in respect of N, P, K, S, Fe and Zn fertilizers. Source, method and scheduling of nutrients for different soils and crops grown under rainfed and irrigated conditions. | | | |
| **Reference books** | | | 1. The Nature and Properties of Soil - N.C.Brady and Ray R. Weil  2. Manures and Fertilizers - K. S. Yawalkar, J.P. Agrawal and S. Bokde  3. Soil Conditions and Plant Growth –E.W.Russeland E.J. Russel |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-110** | | **Principles of Plant Pathology and Pathogens** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **Introduction** | |
| Introduction: Definition and objectives of Plant Pathology. History of Plant Pathology. Terms and concepts in Plant Pathology. Survival and Dispersal of Plant Pathogens | | | |
| **Unit- II** | | **Phenomenon of infection** | |
| Phenomenon of infection – prepenetration, penetration and post penetration. Pathogenesis – Role of enzymes, toxins, growth regulators and polysaccharides. Defense mechanism in plants – Structural and Bio-chemical (pre and postinfection). | | | |
| **Unit-III** | **Important plant pathogenic organisms** | | |
| Introduction, Important plant pathogenic organisms, different groups, fungi, bacteria, fastidious vesicular bacteria, phytoplasmas, spiroplasmas, viruses, viriods, algae, protozoa and phanerogamic parasites with examples of diseases caused by them | | | |
| **Unit-IV** | | | **General characters of fungi** |
| General characters of fungi – somatic structures, types of fungal mycelia –  Modification of mycelia – reproduction in fungi (Vegetative, asexual and sexual) –  nutrition in fungi – Disease cycle – Symptoms of fungal diseases – Classification | | | |
| **Unit-V** | | | **Prokaryotes** |
| Prokaryotes: classification of prokaryotes according to Bergey’s Manual of Systematic Bacteriology. General Characters of fungi, Definition of fungus, somatic structures, types of fungal thalli, fungal tissues, modifications of thallus, reproduction in fungi (asexual and sexual). | | | |
| **Reference books** | | | 1) Agrios, G.N. 2005. Plant Pathology – (5th Edition). Academic Press, New York.  2) Dube, H.C.2009. A Textbook of Fungi, Bacteria and Viruses, Vikas Publishing House P. Ltd, New Delhi.  3) Singh, R.S.1982. Plant Pathogens – The Fungi. Oxford and IBH Publishing Co. New Delhi. |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-112** | | **Insect Morphology and Systematics** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **Classification and Structure** | |
| Classification and Structure : Insect Taxonomy, External Morphology- structure and function of insect cuticle. Body segmentation. Structure of head, thorax and abdomen. Structure and modifications of insect antennae, mouth parts and legs. Wings. Structure of male and female genetalia. Sense organs. Internal Morphology, Behavior | | | |
| **Unit- II** | | **Sense organs** | |
| Sense organs. Metamorphosis, Pest of filed crop of stored grain, Horticulture crop pest, Integrated Pest Management: Introduction, definition, importance, Economic Threshold Level, Economic Injury Level, Biological methods in IPM – classical biological control, merits and limitations of biological control, Parasitoids, Predators and Pathogens, difference between predator and parasitoid, Types of parasitoids. | | | |
| **Unit-III** | **Types of parasitism** | | |
| Types of parasitism, Microbial control – groups of microbial agents and their actions on insects, Non – insect pest (Biology), Damage and Management Pest of filed crop of stored grain Horticulture crop pest, Non – insect pest (Biology), Damage and Management | | | |
| **Unit-IV** | | | **Productive and beneficial insect** |
| Productive and beneficial insect, Silk work : Biology, Nature of Production and Uses, Honey Bees : Biology, Nature of Production and Uses, lac insect and other beneficial insect | | | |
| **Unit-V** | | |  |
| Live stock entomology, Urban Entomology, Medical Entomology, Forensic Entomology, Aquatic Entomology | | | |
| **Reference books** | | | 1) Hajek, A. E. 2004. Natural Enemies: An Introduction to Biological Control. Cambridge university press, Cambridge, England.  2) Lenteren, J.C.V. 2003. Quality Control and Production of Biological Control Agents Theory and Testing Procedures. CAB International, Wallingford, UK, 340 p.  3) Ignacimuthu SS and S. Jayaraj. 2003. Biological Control of Insect Pests. Phoenix Publ., New Delhi.  4) Saxena, A.B. 2003. Biological Control of Insect Pests. Anmol Publ., New Delhi.451p.  5) Khetan, S. K. 2001. Microbial Pest Control. Marcel Dekker, Inc., New York. 321p. |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |

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| **AG-112** | | **Livestock Production and Management (Animal Production)** | |
| **Prerequisite** | | All students are expected to have a general knowledge of biology and chemistry basic principles. | |
| **Learning objective** | | The learning objective of course are: To create an understanding regarding the agriculture, To gain knowledge about silviculture, To have understanding about nature of damage, Able to analyse agriculture management. | |
| **Salient features** | | The student will be able to conceptualize about farming and their management, Able to analyse management practice regarding pest management. | |
| **Utility** | | A degree in Agriculture opens doors to job opportunities in science, industry and environmental management, Conservation and Resource Management, Forest Rangers, tree genetics and biotechnology, forestry technicians and agriculture workers. | |
| **Unit-I** | | **Livestock in the national economy** | |
| Place of livestock in the national economy, different livestock development programmes of Govt. of India. Important exotic and Indian breeds of cattle, buffalo, sheep, goat and swine. | | | |
| **Unit- II** | | **Factors affecting fertility** | |
| Measures and factors affecting fertility in livestock, reproductive behaviour like oestrus, parturition, farrowing etc. Milk secretion, milking of animals and factors affecting milk yield and composition. | | | |
| **Unit-III** | **Selection and breeding of livestock** | | |
| Selection and breeding of livestock for higher milk and meat production. Feeding and management of calves, growing heifers and milch animals and other classes and types of animals, housing principles, space requirements for different species of livestock | | | |
| **Unit-IV** | | | **Disease control measures** |
| Disease control measures, sanitation and care, breeding, feeding and production records. Breed characteristics of poultry, their methods of rearing, breeding, feeding and management, incubation, hatching and brooding. | | | |
| **Unit-V** | | | **Vaccination and prevention of diseases** |
| Vaccination and prevention of diseases, preservation and marketing of eggs, its economics and keeping quality. Cost of production of milk, economical units of cattle, buffalo, sheep, goat and swine | | | |
| **Reference books** | | | 1) Devasenapathy, P., T. Ramesh and B. Gangwar 2007.Efficiency indices for agriculture management research. New India Publishing agency, Delhi.  2) Jayanthi, C. Devasenapathy, P and C. Vennila. 2007. Farming Systems. Principles and practices. Satish Serial Publishing House. Delhi.  3) Palaniappan, SP and K. Sivaraman.2006. Cropping systems in the tropics Principles and management. New Age International (P) Ltd., New Delhi.  4) Panda,S.C,. 2004. Cropping and Farming Systems. Agro bios Publishers. Jodhpur. |
| **Mode of Examination** | | | Assignment/Quiz/Viva-Voce/student seminar/written examination/PPT |
| **Recommended By BOS on:** | | |  |
| **Approved by academic council on:** | | |  |