INVERTIS UNIVERSITY BAREILLY

Established by Govt. of U.P. u/s 2F of UGC Act, 1956 vide U.P. Act 22 of 2010.

# Evaluation Scheme & Syllabus

# Of

# Bachelor of (Hons.) Agriculture
# (I Year)

*(w.e.f. Academic Session 2018-19)*

## DepartmentofAgriculture

## INVERTIS UNIVERSITY - INVERTIS VILLAGE

## Bareilly-LucknowNH-24,Bareilly

## Programme Outcomes of B.Sc. (Hons.) agriculture:

After completion of the program of B.Sc. in (Hons.) Agriculture, every student will know the following attributes:

**PO1:** Agriculture scenario of India and world.

**PO2:** They will know the crops, weeds, insect and diseases.

**PO3:** The will learn different resources both natural and artificial and their rational utilization

**PO4:** They will know seed to seed process i.e. production to marketing and value addition

**PO5:** They will learn marketing skill and commercial management of agricultural farms.

**PO6:** They will gain knowledge both on agriculture enterprises and related enterprises

**PO7:** They will have good communication skills and personality

**PO8:** They will be eligible to start their own agricultural based business or industries

**PO9:** They will have good knowledge of seeds and their production techniques

# Discipline-wise Courses

| S.No | Course Code | Course Title | Credit Hours |
|---|---|---|---|
| **Agronomy** | | | |
| 1. | **BAG 106** | Fundamentals of Agronomy | 4(3+1) |
| 3. | **BAG 301** | Crop Production Technology – I (*Kharif* crops) | 2(1+1) |
| 4. | **BAG 409** | Introductory Agro-meteorology & Climate Change | 2(1+1) |
| 5. | **BAG 401** | Crop Production Technology – II (*Rabi* crops) | 2(1+1) |
| 6. | **BAG 407** | Farming System & Sustainable Agriculture | 1(1+0) |
| 7. | **BAG 591** | Practical Crop Production - I *(Kharif* crops*)* | 2(0+2) |
| 8. | **BAG 507** | Geoinformatics and Nanotechnology and Precision Farming | 2(1+1) |
| 9. | **BAG 010** | Weed Management | 3(2+1) * |
| 10. | **BAG 691** | Practical Crop Production - II *(Rabi* crops*)* | 2(0+2) |
| 11. | **BAG 607** | Principles of Organic Farming | 2(1+1) |
| 12. | **BAG 601** | Rainfed Agriculture & Watershed Management | 2(1+1) |
| 13. | **BAG 011** | System Simulation and Agro-advisory | 3(2+1) * |
| **Plant Breeding & Genetics** | | | |
| 14. | **BAG 201** | Fundamentals of Genetics | 3(2+1) |
| 15. | **BAG 302** | Fundamentals of Plant Breeding | 3(2+1) |
| 16. | **BAG 406** | Principles of Seed Technology | 3(1+2) |
| 17. | **BAG 003** | Commercial Plant Breeding | 3(1+2)* |
| 18. | **BAG 506** | Crop Improvement-I (*Kharif* crops) | 2(1+1) |
| 19. | **BAG606** | Crop Improvement-II (*Rabi* crops) | 2(1+1) |
| 20. | **BAG 008** | Micro propagation Technologies | 3(1+2)* |
| **Soil Science & Agricultural Chemistry** | | | |
| 21. | **BAG 103** | Fundamentals of Soil Science | 3(2+1) |
| 22. | **BAG 404** | Problematic soils and their Management | 2(2+0) |
| 23. | **BAG 502** | Manures, Fertilizers and Soil Fertility Management | 3(2+1) |
| **Entomology** | | | |
| 24. | **BAG 207** | Fundamentals of Entomology | 4(3+1) |
| 26. | **BAG 006** | Biopesticides& Biofertilizers | 3(2+1)* |
| 27. | **BAG 504** | Pests of Crops and Stored Grain and their Management | 3(2+1) |
| 28. | **BAG 605** | Management of Beneficial Insects | 2(1+1) |
| **Agricultural Economics** | | | |
| 29. | **BAG 205** | Fundamentals of Agricultural Economics | 2(2+0) |
| 30. | **BAG 303** | Agricultural Finance and Co-Operation | 3(2+1) |
| 31. | **BAG 408** | Agricultural Marketing Trade & Prices | 3(2+1) |
| 32. | **BAG 001** | Agribusiness Management | 3(2+1)* |
| 33. | **BAG 608** | Farm Management, Production & Resource Economics | 2(1+1) |

| | | | |
|---|---|---|---|
| **Agricultural Engineering** | | | |
| 34. | **BAG 203** | Soil and Water Conservation Engineering | 2(1+1) |
| 35. | **BAG 305** | Farm Machinery and Power | 2(1+1) |
| 36. | **BAG 403** | Renewable Energy and Green Technology | 2(1+1) |
| 37. | **BAG 602** | Protected Cultivation and Secondary Agriculture | 2(1+1) |
| **Plant Pathology** | | | |
| 38. | **BAG 206** | Fundamentals of Plant Pathology | 4(3+1) |
| 39. | **BAG 503** | Diseases of Field and Horticultural Crops and their Management-I | 3(2+1) |
| 40. | **BAG 603** | Diseases of Field and Horticultural Crops and their Management-II | 3(2+1) |
| 41. | **BAG 501** | Principles of Integrated Pest and Disease Management | 2(1+1) |
| **Horticulture** | | | |
| 42. | **BAG 101** | Fundamentals of Horticulture | 2(1+1) |
| 43. | **BAG 306** | Production Technology for Vegetables and Spices | 2(1+1) |
| 44. | **BAG 405** | Production Technology for Fruit and Plantation Crops | 2(1+1) |
| 45. | **BAG 402** | Production Technology for Ornamental Crops, MAP and Landscaping | 2(1+1) |
| 46. | **BAG 009** | Hi-tech. Horticulture | 3(2+1)* |
| 47. | **BAG 004** | Landscaping | 3(2+1)* |
| 48. | **BAG 604** | Post-harvest Management and Value Addition ofFruits and Vegetables | 2(1+1) |
| **Food Science & Technology** | | | |
| 49. | **BAG 609** | Principles of Food Science & Nutrition | 2(2+0) |
| **Agricultural Extension and Communication** | | | |
| 50. | **BAG 110** | Rural Sociology & Educational Psychology | 2(2+0) |
| 51. | **BAG 208** | Fundamentals of Agricultural Extension Education | 3(2+1) |
| 52. | **BAG 209** | Communication Skills and Personality Development | 2(1+1) |
| 53. | **BAG 505** | Entrepreneurship Development and Business Communication | 2(1+1) |
| 54. | **BAG 012** | Agricultural Journalism | 3(2+1)* |
| **Biochemistry / Physiology / Microbiology/ Environmental Sciences (Basic Science)** | | | |
| 55. | **BAG 204** | Fundamentals of Crop Physiology | 2(1+1) |
| 56. | **BAG 202** | Agricultural Microbiology | 2(1+1) |
| 57. | **BAG 307** | Environmental Studies & Disaster Management | 3(2+1) |
| 58. | **BAG 102** | Fundamentals of Plant Biochemistry and Biotechnology | 3(2+1) |
| | **BAG104** | Introduction to Forestry | 2 (1+1) |
| **Statistics, Computer Application and I.P.R.** | | | |
| 59. | **BAG 308** | Statistical Methods | 2(1+1) |
| 60. | **BAG 304** | Agri-Informatics | 2 (1+1) |
| 61. | **BAG 508** | Intellectual Property Rights | 1(1+0) |
| **Animal Production** | | | |

| | | | |
|---|---|---|---|
| 62. | **BAG309** | Livestock and Poultry Management | 4(3+1) |
| **Language** | | | |
| 63. | **BAG 105** | Comprehension & Communication Skills in English | 2(1+1) |
| **Remedial Courses** | | | |
| 64. | **BAG 107** | Introductory Biology | 2(1+1) |
| 65. | **BAG 108** | Elementary Mathematics | 2(2+0) |
| 2. | **BAG 109** | Agricultural Heritage | 1(1+0) |
| **Non-Gradial Courses** | | | |
| | **BAG 158** | NSS/NCC/Physical Education & Yoga Practices | 2(0+2) |
| | **BAG 111** | Human Values & Ethics | 1(1+0) |
| ***: Elective course, 2(1+1)= 2 lecture per week (1 for lecture and 1 for practical)** | | | |

# Semester: 7th

| | | |
|---|---|---|
| **BAG751** | **Rural Agricultural Work Experience and Agro-industrial Attachment (RAWE &AIA)** | |
| | Activities | No. of weeks |
| | General Orientation & On campus training by different faculties | 1 |
| | Village attachment | 8 |
| | Unit attachment in Univ./ College. KVK/ Research Station Attachment | 5 |
| | Plant clinic | 2 |
| | Agro-Industrial Attachment | 3 |
| | Project Report Preparation, Presentation and Evaluation | 1 |
| | **Total weeks for RAWE & AIA** | **20** |

# Semester: 8th

| Subject Code | Title of the module (ELP PROGRAMME) | Credits |
|---|---|---|
| BAG851 | Production Technology for Bioagents and Biofertilizer | 0+10 |
| BAG852 | Seed Production and Technology | 0+10 |
| BAG853 | Mushroom Cultivation Technology | 0+10 |
| BAG854 | Soil, Plant, Water and Seed Testing | 0+10 |
| BAG855 | Commercial Beekeeping | 0+10 |
| BAG856 | Poultry Production Technology | 0+10 |
| BAG857 | Commercial Horticulture | 0+10 |
| BAG858 | Floriculture and Landscaping | 0+10 |
| BAG859 | Food Processing | 0+10 |
| BAG860 | Agriculture Waste Management | 0+10 |
| BAG861 | Organic Production Technology | 0+10 |
| BAG862 | Commercial Sericulture | 0+10 |

**ELP:Experiential Learning Programme**

# Examination Scheme (First Semester)

| I Semester (Credit hours distribution) | | | |
|---|---|---|---|
| **S.No** | **Course Code** | **Course Title** | **Credit Hours** |
| 1. | BAG101 | Fundamental of horticulture | 2 (1+1) |
| 2. | BAG102 | Fundamentals of Plant Biochemistry and Biotechnology | 3(2+1) |
| 3. | BAG103 | Fundamentals of Soil Science | 3 (2+1) |
| 4. | BAG104 | Introduction to Forestry | 2 (1+1) |
| 5. | BAG105 | Comprehension & Communication Skills in English | 2 (1+1) |
| 6. | BAG106 | Fundamentals of Agronomy | 4(3+1) |
| 7. | BAG107/BAG108 | Introductory Biology*/ Elementary Mathematics* | 2(1+1)/2(2+0)* |
| 8. | BAG109 | Agricultural Heritage* | 1(1+0)* |
| 9. | BAG110 | Rural Sociology & Educational Psychology | 2(2+0) |
| 10. | BAG111 | Human Values & Ethics (Non-gradial)** | 1(1+0) |
| 11. | BAG 158 | NSS/NCC/Physical Education & Yoga Practices** | 2(0+2) |
| **TOTAL** | | | **18+03*+03**** |

*R: Remedial course; **NC: Non-gradial courses,3(2+1): 3 lectures per week, (2+1) :indicate 2 Lecture and one practical

| Evaluation Scheme | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Course code** | **Course title** | **C** | **L** | **P** | **PM** | **UT** | **ESM** | **T** | **FM** |
| BAG101 | Fundamental of horticulture | 2 | 1 | 1 | 20 | 30 | 50 | 100 | 200 |
| BAG102 | Fundamentals of Plant Biochemistry and Biotechnology | 3 | 2 | 1 | 20 | 30 | 50 | 100 | 300 |
| BAG103 | Fundamentals of Soil Science | 3 | 2 | 1 | 20 | 30 | 50 | 100 | 300 |
| BAG104 | Introduction to Forestry | 2 | 1 | 1 | 20 | 30 | 50 | 100 | 200 |
| BAG105 | Comprehension and Communication Skills in English | 2 | 1 | 1 | 20 | 30 | 50 | 100 | 200 |
| BAG106 | Fundamentals of Agronomy | 4 | 3 | 1 | 20 | 30 | 50 | 100 | 400 |
| BAG 107 | Introductory Biology* | 2 | 1 | 1 | 20 | 30 | 50 | 100 | 200 |
| BAG 108 | Elementary Mathematics* | 2 | 2 | 0 | 0 | 50 | 50 | 100 | 200 |
| BAG109 | Agricultural Heritage* | 1 | 1 | 0 | 0 | 50 | 50 | 100 | 100 |
| BAG110 | Rural Sociology & Educational Psychology | 2 | 2 | 0 | 0 | 50 | 50 | 100 | 200 |
| BAG111 | Human Values & Ethics (Non-gradial)** | 1 | 1 | 0 | 0 | 50 | 50 | 100 | 0 |
| BAG 158 | NSS/NCC/Physical Education & Yoga Practices(Non-gradial)** | 2 | 0 | 2 | 100 | 0 | 0 | 100 | 0 |
| **Total** | | | | | | | | | 2100 |
| *R: Remedial course; **NC: Non-gradial courses, C-Credit, L-Lecture, P-Practical, UT-Unit test, ESM: End semester marks, FM-Final marks (TXC) | | | | | | | | | |

| BAG 101: FUNDAMENTAL OF HORTICULTURE | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lectures and Practical: 2 hr./ week (1+1) | Unit Test: 30Marks |
| Tutorials: Nil | Practical marks: 20Marks |
| Credits: 2 | End Semester Exam:50Marks |

**Course Objectives:**

1. To study about horticulture and its different branches.
2. To study the climate and soil required by different horticulture crops.
3. To study plant propagation methods and structures
4. To give an overview on unfruitfulness, pollination, fertilization and parthenocarpy
5. To give the knowledge of plant bio regulators in horticulture crops
6. To study cultivation of different aromatic and medicinal plants along with their uses

**Syllabus**

**Theory**

Horticulture - Its definition and branches, importance and scope; horticultural and botanical classification; climate and soil for horticultural crops; Plant propagation-methods and propagating structures; Seed dormancy, Seed germination, principles of orchard establishment; Principles and methods of training and pruning, juvenility and flower bud differentiation; unfruitfulness; pollination, pollinizers and pollinators; fertilization and parthenocarpy; medicinal and aromatic plants; importance of plant bio-regulators in horticulture. Irrigation – methods, Fertilizer application in horticultural crops.

**Practical**

Identification of garden tools. Identification of horticultural crops. Preparation of seed bed/ nursery bed. Practice of sexual and asexual methods of propagation including micro-propagation. Layout and planting of orchard. Training and pruning of fruit trees. Preparation of potting mixture. Fertilizer application in different crops. Visits to commercial nurseries/orchard.

**Text and Reference books:**

1.Jitendra Singh, Basic horticulture Kalyani Publications, New Delhi
2.Chadha, K.L. Handbook of Horticulture (2002) ICAR, NewDelhi
3.Kaushal Kumar Mishra and Rajesh Kumar Fundamentals of Horticulture 2014. Biotech Books
4.Basra, A.S. Plant Growth Regulators in Agriculture & Horticulture: Their Role and commercial use IBD

**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. To get familiar with important horticulture trees |
| 2. Preparation of quality planting material |
| 3. Designing and shaping of trees |
| 4. Learning about practices for cultivation of MAPs |
| 5. Understand medicinal value of different plants |

| BAG102:FUNDAMENTALS OF PLANT BIOCHEMISTRY ANDBIOTECHNOLOGY | |
|---|---|
| **Teaching Scheme**<br>Lectures and Practical: 3 hr./ week (2+1)<br>Tutorials: Nil<br>Credits: 3 | **Examination Scheme**<br>Unit Test: 30Marks<br>Practical marks: 20Marks<br>End Semester Exam:50Marks |

**Course Objectives:**

1. To give complete knowledge and information about the subject
2. To give an overview of different types of biomolecules.
3. To explain the structure and function of plant constituents and components.
4. To describe all biological phenomena at molecular level.

**Syllabus**

**Theory**

Importance of Biochemistry. Properties of Water, pH and Buffer. Carbohydrate: Importance and classification. Structures of Monosaccharides, Reducing and oxidizing properties of Monosaccharides, Mutarotation; Structure of Disaccharides and Poly saccharides. Lipid:Importance and classification; Structures and properties of fatty acids; storage lipids and membrane lipids. Proteins: Importance of proteins and classification; Structures, titration and zwitterions nature of amino acids; Structural organization of proteins. Enzymes: General properties; Classification; Mechanism of action; Michaelis & Menten and Line Weaver Burk equation & plots; Introduction to allosteric enzymes. Nucleic acids: Importance and classification; Structure of Nucleotides, A, B & Z DNA; RNA: Types and Secondary & Tertiary structure. Metabolism of carbohydrates: Glycolysis, TCA cycle, Glyoxylate cycle, Electron transport chain. Metabolism of lipids: Beta oxidation, Biosynthesis of fatty acids.

Concepts and applications of plant biotechnology: Scope, organ culture, embryo culture, cell suspension culture, callus culture, anther culture, pollen culture and ovule culture and their applications; Micro-propagation methods; organogenesis and embryogenesis, Synthetic seeds and their significance; Embryo rescue and its significance; somatic hybridization and cybrids; Somaclonal variation and its use in crop improvement; cryo-preservation; Introduction to recombinant DNA methods: physical (Gene gun method), chemical (PEG mediated) and Agrobacterium mediated gene transfer methods; Transgenics and its importance in crop improvement; PCR techniques and its applications; RFLP, RAPD, SSR; Marker Assisted Breeding in crop improvement; Biotechnology regulations.

**Practical**

Preparation of solution, pH & buffers, Qualitative tests of carbohydrates and amino acids. Quantitative estimation of glucose/ proteins. Titration methods for estimation of amino acids/lipids, Effect of pH, temperature and substrate concentration on enzyme action, Paper chromatography/ TLC demonstration for separation of amino acids/ Monosaccharides. Sterilization techniques. Composition of various tissue culture media and preparation of stock solutions for MS nutrient medium. Callus induction from various explants. Micro-propagation, hardening and acclimatization. Demonstration on isolation of DNA. Demonstration of gel electrophoresis techniques and DNA finger printing.

**Text and Reference books:**

1.Plant Biochemistry- V. Arun Kumar, N. Senthil Kumar and K. Siva Kumar.
2. A Textbook of Biotechnology, Revised Edition, 2014, R.C. Dubey, S. Chand Publishing Company, New Delhi
3. Principles of Biochemistry by Albert Lehninger, David Nelson and Michael Cox, Seventh Edition, 2017 Macmillan Publishers**.**

**Course Outcomes:**

| **After completing the course, students will be able to:** |
|---|
| 1. Understand the core principles and topics of Biochemistry and their experimental basis |
| 2. Understand the structures and functions of enzymes, proteins, carbohydrates, fats, process of metabolism. |
| 3. Understand about the molecular basis of the action of genes and DNA . |

| BAG 103: FUNDAMENTAL OF SOIL SCIENCE | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lectures and Practical: 3 hr./ week (2+1) | Unit Test: 30Marks |
| Tutorials: Nil | Practical marks: 20Marks |
| Credits: 3 | End Semester Exam:50Marks |

**Course Objectives:**

1To impart knowledge about basic concept of soil alumina silicate minerals.

2. To know the process of soil formation and soil classification.

3. To know the physical properties of soils and processes in relation to plant growth.

4. This course also familiarize student with soil colloids, ion exchange phenomenon, problems of soil irrigation water quality and soil environment quality

**Syllabus**

**Theory**

Soil as a natural body, Pedological and edaphological concepts of soil; Soil genesis: soil forming rocks and minerals; weathering, processes and factors of soil formation; Soil Profile, components of soil; Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity; Elementary knowledge of soil taxonomy classification and soils of India; Soil water retention, movement and availability; Soil air, composition, gaseous exchange, problem and plant growth, Soil temperature; source, amount and flow of heat in soil; effect on plant growth, Soil reaction-pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability; soil colloids - inorganic and organic; silicate clays: constitution and properties; sources of charge; ion exchange, cation exchange capacity, base saturation; soil organic matter: composition, properties and its influence on soil properties; humic substances - nature and properties; soil organisms: macro and micro organisms, their beneficial and harmful effects; Soil pollution - behaviour of pesticides and inorganic contaminants, prevention and mitigation of soil pollution.

**Practical**

Study of soil profile in field. Study of soil sampling tools, collection of representative soil sample, its processing and storage. Study of soil forming rocks and minerals. Determination of soil density, moisture content and porosity. Determination of soil texture by feel and Bouyoucos Methods. Studies of capillary rise phenomenon of water in soil column and water movement in soil. Determination of soil pH and electrical conductivity. Determination of cation exchange capacity of soil. Study of soil map. Determination of soil colour. Demonstration of heat transfer in soil. Estimation of organic matter content of soil

**Text and Reference books:**

1.Fundamental of Soil Science.2012. Indian Society of Soil Science.2nd Edition.

2.Dilip Kumar Das.2015. Introductory Soil Science. Kalyani Publishers (4 edition).

**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. Understand about soil its properties and linkage with crop production |
| 2. Management of soils |
| 2. Determination of different soil properties |

| BAG104: INTRODUCTION TO FORESTRY | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lectures and Practical: 2 hr./ week (1+1) | Unit Test: 30Marks |
| Tutorials: Nil | Practical marks: 20Marks |
| Credits: 2 | End Semester Exam:50Marks |

**Course Objectives:**

1. To give complete knowledge and information about the subject
2. To give an overview of different types of trees and other plants
3. To explain the Indian and International history of its development.
4. To describe all growth and development phases and losses to the forest
5. To give the knowledge of impotence of management and conservation of forest for society and earth.

**Syllabus**

**Theory**

Introduction – definitions of basic terms related to forestry, objectives of silviculture, forest classification, salient features of Indian Forest Policies. Forest regeneration, Natural regeneration - natural regeneration from seed and vegetative parts, coppicing, pollarding, root suckers; Artificial regeneration – objectives, choice between natural and artificial regeneration, essential preliminary considerations. Crown classification. Tending operations – weeding, cleaning, thinning – mechanical, ordinary, crown and advance thinning. Forest mensuration – objectives, diameter measurement, instruments used in diameter measurement; Non instrumental methods of height measurement - shadow and single pole method; Instrumental methods of height measurement - geometric and trigonometric principles, instruments used in height measurement; tree stem form, form factor, form quotient, measurement of volume of felled and standing trees, age determination of trees. Agroforestry – definitions, importance, criteria of selection of trees in agroforestry, different agroforestry systems prevalent in the country, shifting cultivation, Taunya, alley cropping, wind breaks and shelter belts, home gardens. Cultivation practices of two important fast growing tree species of the region.

**Practical**

Identification of tree-species. Diameter measurements using calipers and tape, diameter measurements of forked, buttressed, fluted and leaning trees. Height measurement of standing trees by shadow method, single pole method and hypsometer. Volume measurement of logs using various formulae. Nursery lay out, seed sowing, vegetative propagation techniques. Forest plantations and their management. Visits of nearby forest based industries.

**Text and Reference books:**

1.Indian Forestry by Manikandan and Jain, Kalyani publisher
2.Forest mensuration by A. N. Chaturvedi, L. S. Khanna, International Book Distributors

**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. Understand the different types of plants and forest in nature or earth |
| 2. Understand the methods for felling of trees and regeneration of crop. |
| 3. Understand about the importance of protection and conservation of flora and fauna. |
| 4. Understand the role of forest in global aspects. |
| 5. Understand the basic concepts and the scope of forestry |

| BAG105: COMPREHENSION & COMMUNICATION SKILLS IN ENGLISH | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lectures and Practical: 2 hr./ week (1+1) | Unit Test: 30Marks |
| Tutorials: Nil | Practical marks: 20Marks |
| Credits: 2 | End Semester Exam:50Marks |

**Course Objectives:**

1. To provide an overview of prerequisites to Business Communication.
2. To put in use the basic mechanics of Grammar.
3. Analyze a variety of communication acts.
4. Ethically use, document and integrate sources.
5. Students will identify and explain their goals for the semester.
6. Identify the needs communication helps us meet.
7. Identify common misconceptions about communication
8. Explain communication competence
9. Identify the reasons we commit perceptual errors.
10. To impart the correct practices of the strategies of Effective Business Writing.

**Syllabus**

**Theory**

War Minus Shooting- The sporting Spirit. A Dilemma- A layman looks at science Raymond B. Fosdick. You and Your English – Spoken English and broken English G.B. Shaw. Reading Comprehension, Vocabulary- Antonym, Synonym, Homophones, Homonyms, often confused words. Exercises to Help the students in the enrichment of vocabulary based on TOEFL and other competitive examinations. Functional grammar: Articles, Prepositions, Verb, Subject verb Agreement, Transformation, Synthesis, Direct and Indirect Narration. Written Skills: Paragraph writing, Precise writing, Report writing and Proposal writing. The Style: Importance of professional writing. Preparation of Curriculum Vitae and Job applications. Synopsis Writing. Interviews: kinds, Importance and process.

**Practical**

Listening Comprehension: Listening to short talks lectures, speeches (scientific, commercial and general in nature). Oral Communication: Phonetics, stress and intonation, Conversation practice. Conversation: rate of speech, clarity of voice, speaking and Listening, politeness & Reading skills: reading dialogues, rapid reading, intensive reading, improving reading skills. Mock Interviews: testing initiative, team spirit, leadership, intellectual ability. Group Discussions.

**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. To draft effective business correspondence with brevity and clarity. |
| 2. Students will be able to find, use, and evaluate primary academic writing associated with the communication discipline. |
| 3. Students will be able to communicate effectively orally and in writing. |
| 4. To demonstrate his Verbal and non-verbal communication ability through presentations. |

| BAG106: FUNDAMENTALS OF AGRONOMY | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lectures and Practical: 4 hr./ week (3+1) | Unit Test: 30Marks |
| Tutorials: Nil | Practical marks: 20Marks |
| Credits: 4 | End Semester Exam:50Marks |

**Course Objectives:**

**1**. To impart basic knowledge of agronomy and its scope

2. To give an overview of different types of crops and their classification

3. To understand the production and classification of manures and fertilizers.

4. To impart knowledge on irrigation, its requirement and scheduling and methods of application

5. Identification, classification and management of weeds.

**Syllabus**

**Theory**

Agronomy and its scope, seeds and sowing, tillage and tilth, crop density and geometry, Crop nutrition, manures and fertilizers, nutrient use efficiency, water resources, soil-plant-water relationship, crop water requirement, water use efficiency, irrigation- scheduling criteria and methods, quality of irrigation water, logging.

Weeds- importance, classification, crop weed competition, concepts of weed management principles and methods, herbicides- classification, selectivity and resistance, allelopathy. Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, crop management technologies in problematic areas, harvesting and threshing of crops.

**Practical**

Identification of crops, seeds, fertilizers, pesticides and tillage implements, study of agroclimatic zones of India, Identification of weeds in crops, Methods of herbicide and fertilizer application, Study of yield contributing characters and yield estimation, Seed germination and viability test, Numerical exercises on fertilizer requirement, plant population, herbicides and water requirement, Use of tillage implements-reversible plough, one way plough, harrow, leveler, seed drill, Study of soil moisture measuring devices, Measurement of field capacity, bulk density and infiltration rate, Measurement of irrigation water.

**Text and Reference books:**


1. Reddy, T.Yellamanda and Reddy, G.H. Sankara. 2016. Principles of Agronomy (2nd edition) , Kalyani Publishers, Ludhiana
2. ICAR. 2010. Handbook of Agriculture (6th edition), Indian Council of Agricultural Research, New Delhi.
3. Reddy, S.R.2012. Principles of Crop Production (4th edition), Kalyani Publishers, Ludhiana
4. Gupta , O.P. 2005. Weed Management: Principles and Practices (2nd Ed) Agribios (India) Jodhpur.
5. . De, Gopal Chandra 1989, Fundamentals of Agronomy. Oxford & IBH Publishing Co., New-Delhi.

**Course Outcomes:**

| **After completing the course, students will be able to:** |
|---|
| 1. Broad knowledge on different components of agriculture |
| 2.Get acquainted with modern machines and agricultural tools |
| 3.Managing inputs both monetary and non-monetary in a scientific manner |
| 4. Learning about irrigation methods and its precise application |
| 5. Preventing unproductive losses on and off the fields |
| |

| BAG107: INTRODUCTORY BIOLOGY | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lectures and Practical: 2 hr./ week (1+1) | Unit Test: 30Marks |
| Tutorials: Nil | Practical marks: 20Marks |
| Credits: 2 | End Semester Exam:50Marks |

**Course Objectives:**

1. To give complete knowledge and information about the subject
2. To give an overview of different types of cells and organisms on earth
3. To give the formation history and origin of life on earth
4. To describe all types of plant and animal kingdom and their evolution

**Syllabus**

**Theory**

Introduction to the living world, diversity and characteristics of life, origin of life, Evolution and Eugenics. Binomial nomenclature and classification Cell and cell division. Morphology of flowing plants. Seed and seed germination. Plant systematic- viz; Brassicaceae, Fabaceae and Poaceae. Role of animals in agriculture.

**Practical**

Morphology of flowering plants – root, stem and leaf and their modifications, Inflorescence, flower and fruits. Cell, tissues & cell division, Internal structure of root, stem and leaf, Study of specimens and slides,Description of plants - Brassicaceae, Fabaceae and Poaceae.

**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. Understand the levels of organization and related functions in plants and animals. |
| 2. Understand the characteristics and basic needs of living individuals and their environment |
| 3. Understand about the growth and development of organisms. |
| 4. The student will be able to explain the importance of biodiversity at the genetic, organismal, community, and global scales. |

| BAG108: ELEMENTARY MATHEMATICS | |
|---|---|
| **Teaching Scheme**<br>Lectures: 2 hr./ week (2+0)<br>Tutorials: Nil<br>Credits: 2 | **Examination Scheme**<br>Unit Test: 50Marks<br>End Semester Exam:50Marks |

**Course Objectives:**

1. To give complete knowledge and information about the subject
2. To give knowledge on basics of calculation and computation
3. Learning various methods and procedures of calculations
4. To understand and be able to use the language, symbols and notation of mathematics
5. Learn to solve systems of linear equations and application problems requiring them

**Syllabus**

**Theory**

Straight lines : Distance formula, section formula (internal and external division), Change of axes (only origin changed), Equation of co-ordinate axes, Equation of lines parallel to axes, Slope-intercept form of equation of line, Slope-point form of equation of line, Two point form of equation of line, Intercept form of equation of line, Normal form of equation of line, General form of equation of line, Point of intersection of two st. lines, Angles between two st. lines, Parallel lines, Perpendicular lines, Angle of bisectors between two lines, Area of triangle and quadrilateral. Circle: Equation of circle whose centre and radius is known, General equation of a circle, Equation of circle passing through three given points, Equation of circle whose diameters is line joining two points (x1, y1) & (x2,y2), Tangent and Normal to a given circle at given point (Simple problems), Condition of tangency of a line y = mx + c to the given circle x2 + y2 = a2. Differential Calculus : Definition of function, limit and continuity, Simple problems on limit, Simple problems on continuity, Differentiation of xn , ex , sin x & cos x from first principle, Derivatives of sum, difference, product and quotient of two functions, Differentiation of functions of functions (Simple problem based on it), Logarithmic differentiation (Simple problem based on it), Differentiation by substitution method and simple problems based on it, Differentiation of Inverse Trigonometric functions. Maxima and Minima of the functions of the form y=f (x) (Simple problems based on it).

Integral Calculus : Integration of simple functions, Integration of Product of two functions, Integration by substitution method, Definite Integral (simple problems based on it), Area under simple well-known curves (simple problems based on it).

Matrices and Determinants: Definition of Matrices, Addition, Subtraction, Multiplication,Transpose and Inverse up to 3rd order, Properties of determinants up to 3rd order and their evaluation.

**Text and Reference books:**

1.Krishi Ganita by Gokhroo and Jain
2. Differential Calculus by Gokhroo.
3. Integral Calculus by Gokhroo.
4. Shukla, R.K. and Kumar, K.2010. A Text Book Of Remedial Mathematics.A.B.Publication

**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. Development of skills in different aspect of mathematical procedures. |
| 2. Develop mathematical curiosity and use inductive and deductive reasoning when solving problems. |
| 3. Solve the matrix equation Ax = b using row operations and matrix operations. |

| BAG109: AGRICULTURAL HERITAGE | |
|---|---|
| **Teaching Scheme**<br>Lectures: 1 hr./ week (1+0)<br>Tutorials: Nil<br>Credits: 1 | **Examination Scheme**<br>Unit test:50<br>End Semester Exam: 50 Marks |

**Course Objectives:**

1. To give complete knowledge and information about the subject
2. To give an overview of journey of Indian agriculture
3. To give knowledge on agriculture setup in India
4. To describe all the issues related to agriculture.

**Syllabus**

**Theory**

Introduction of Indian agricultural heritage; Ancient agricultural practices, Relevance of heritage to present day agriculture; Past and present status of agriculture and farmers in society; Journey of Indian agriculture and its development from past to modern era; Plant production and protection through indigenous traditional knowledge; Crop voyage in India and world; Agriculture scope; Importance of agriculture and agricultural resources available in India; Crop significance and classifications; National agriculture setup in India; Current scenario of Indian agriculture; Indian agricultural concerns and future prospects.

**Text and Reference books**


1. ICAR 1989 Handbook of Agriculture, Indian Council of Agricultural Research, New-Delh
2. 2. Nene, Y.L. 2007. Glimpses of the Agricultural Heritage of India. Asian Agri-Histroy Foundation, Secunderabad, Andhra Pradesh
3. Nene, Y.L., Choudhary, S.L. and Saxena, R.C. 2010. Textbook on Ancient History of Indian Agriculture, Asian Agri-History Foundation
4. Omprakash and S/Kumar.2019. Agriculture heritage, Rama publishing house.


**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1.Understanding the ancient agricultural practices. |
| 2. Quittance with different ITK practices. |
| 3. Knowing about agriculture education research and development setup in the country |
| 4. Learning present issues and future prospects related to agriculture |

| BAG 110: RURAL SOCIOLOGY & EDUCATIONAL PSYCHOLOGY | |
|---|---|
| **Teaching Scheme**<br>Lectures: 2 hr./ week (2+0)<br>Tutorials: Nil<br>Credits: 2 | **Teaching Scheme**<br>Lectures: 2 hr./ week (2+0)<br>Tutorials: Nil<br>Credits: 2 |

**Course Objectives:**

1. To give complete knowledge and information about the subject
2. To give an overview of Panchayati raj system of India
3. To explain the difference between sociology and psychology

**Syllabus**

**Theory**

Sociology and Rural sociology: Definition and scope, its significance in agriculture extension, Social Ecology, Rural society, Social Groups, Social Stratification, Culture concept, Social Institution, Social Change & Development. Educational psychology: Meaning & its importance in agriculture extension. Behavior: Cognitive, affective, psychomotor domain, Personality, Learning, Motivation, Theories of Motivation, Intelligence.

**Text and Reference books**


1. Desai, A.R. 1978. Rural sociology in India. Bombay, Popular Prakashan, 5th Rev. ed.
2. Doshi, S.L. 2007. Rural sociology. Rawat Publishers, Delhi
3. Sharma O. P. and Somani L. L. 2012. Fundamentals of Rural Sociology and Educational Psychology. Agrotech Pub. Co., Udaipur.


**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1.Understanding rural scenario of the country |
| 2. Understanding traditional knowledge and its application |
| 3.Understanding rural social structures |
| 4. Understanding steps to elevate rural problems |

| BAG 111: HUMAN VALUE AND ETHICS | |
|---|---|
| **Teaching Scheme**<br>Lectures: 1 hr./ week (1+0)<br>Tutorials: Nil<br>Credits: 1 | **Examination Scheme**<br>Unit Test: 50 Marks<br>End Semester Exam: 50 Marks |

**Course Objectives:**

1.To assist students in understanding the differences between values and skills in understanding the need, basic guidelines, content and the process of value education.

2.To help students initiate a process of dialog within themselves to understand what they 'really want to be' in their lives and professions

3. To help students understand the meaning of happiness and prosperity for human beings.

4.To help students understand harmony at all the levels of human living and to lead an ethical life.

**Syllabus**

**Theory**

Values and Ethics-An Introduction. Goal and Mission of Life. Vision of Life. Principles and Philosophy. Self Exploration. Self Awareness. Self Satisfaction. Decision Making. Motivation. Sensitivity. Success. Selfless Service. Case Study of Ethical Lives. Positive Spirit. Body, Mind and Soul. Attachment and Detachment. Spirituality Quotient. Examination

**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1.Understanding truth of life, family and social values |
| 2. Understanding stress and its management |
| 3. Preparing and planning to be a good citizen |

| BAG 158:PHYSICAL EDUCATION & YOGA PRACTICES | |
|---|---|
| **Teaching Scheme**<br>Lectures: 2 hr./ week (0+2)<br>Tutorials: Nil<br>Credits: 2 | **Examination Scheme**<br>Practical marks: 100 Marks |

**Course Objectives:**

1. Aims at evoking social consciousness among students through various activities viz., working together.
2. To reduce the gap between educated and uneducated community.
3. To make student aware about the benefits of health.
4. To develop self-employment ability among the students.

**Practical:**

Course aims at evoking social consciousness among students through various activities viz., working together, constructive and creative social work, to be skillful in executing democratic leadership, developing skill in programme development to be able for self employment, reducing gap between educated and uneducated, increasing awareness and desire to help sections of society.

**Physical Education and Yoga Practices Credit hours: 2(0+2)**

Semester I: Physical Education and Yoga Practices

Semester I: Physical Education and Yoga Practices

1. Teaching of skills of Football – demonstration, practice of the skills, correction, involvement in game situation (For girls teaching of Tennikoit)
2. Teaching of different skills of Football – demonstration, practice of the skills, correction, involvement in game situation (For girls teaching of Tennikoit)
3. Teaching of advance skills of Football – involvement of all the skills in game situation with teaching of rules of the game
4. Teaching of skills of Basketball – demonstration, practice of the skills, correction of skills, involvement in game situation
5. Teaching of skills of Basketball – demonstration, practice of the skills, involvement in game situation
6. Teaching of skills of Basketball – involvement of all the skills in game situation with teaching of rule of the game
7. Teaching of skills of Kabaddi – demonstration, practice of the skills, correction of skills, involvement in game situation
8. Teaching of skills of Kabaddi – demonstration, practice of the skills, correction of skills, involvement in game situation
9. Teaching of advance skills of Kabaddi – involvement of all the skills in game situation with teaching of rule of the game
10. Teaching of skills of Ball Badminton – demonstration, practice of the skills, correction of skills, involvement in game situation
11. Teaching of skills of Ball Badminton – involvement of all the skills in game situation with teaching of rule of the game
12. Teaching of some of Asanas – demonstration, practice, correction and practice
13. Teaching of some more of Asanas – demonstration, practice, correction and practice

14. Teaching of skills of Table Tennis – demonstration, practice of skills, correction and practice and involvement in game situation
15. Teaching of skills of Table Tennis – demonstration, practice of skills, correction and practice and involvement in game situation
16. Teaching of skills of Table Tennis – involvement of all the skills in game situation with teaching of rule of the game
17. Teaching – Meaning, Scope and importance of Physical Education
18. Teaching – Definition, Type of Tournaments
19. Teaching – Physical Fitness and Health Education
20. Construction and laying out of the track and field (*The girls will have Tennikoit and Throw
Ball).

**Semester II: Physical Education and Yoga Practices**

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
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.
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.
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.

**Note: 1)** Compulsory Uniform: Half pants, Tee Shirts, Shoes and socks all white (Girls will have white Tee Shirt and Track pants) 2) The games mentioned in the practical may be inter changed depending on the season and facilities.

**Course title : Educational Tour: 2 (0+2)**

# Examination Scheme (II Semester)

| II Semester (Credit hours distribution) | | | |
|---|---|---|---|
| **S.No** | **Course Code** | **Course Title** | **Credit Hours** |
| 1. | BAG 201 | Fundamental of Genetics | 3 (2+1) |
| 2. | BAG 202 | Agricultural Microbiology | 2 (1+1) |
| 3. | BAG203 | Soil and Water Conservation Engineering | 2 (1+1) |
| 4. | BAG204 | Fundamentals of Crop Physiology | 2 (1+1) |
| 5. | BAG205 | Fundamentals of Agricultural Economics | 2 (2+0) |
| 6. | BAG206 | Fundamentals of Plant Pathology | 4(3+1) |
| 7. | BAG207 | Fundamentals of Entomology | 4(3+1) |
| 8. | BAG208 | Fundamentals of Agricultural Extension Education | 3(2+1) |
| 9. | BAG209 | Communication Skills and Personality Development | 2(1+1) |
| **TOTAL CREDITS** | | | **24 (16+8)** |
| 3(2+1): 3 lectures per week, (2+1) :indicate 2 Lecture and one practical | | | |

| Evaluation Scheme | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Course code** | **Course title** | **C** | **L** | **P** | **PM** | **UT** | **ESM** | **T** | **FM** |
| BAG201 | Fundamentals of Genetics | 3 | 2 | 1 | 20 | 30 | 50 | 100 | 300 |
| BAG202 | Agricultural Microbiology | 2 | 1 | 1 | 20 | 30 | 50 | 100 | 200 |
| BAG203 | Soil and Water Conservation Engineering | 2 | 1 | 1 | 20 | 30 | 50 | 100 | 200 |
| BAG204 | Fundamentals of Crop Physiology | 2 | 1 | 1 | 20 | 30 | 50 | 100 | 200 |
| BAG205 | Fundamentals of Agricultural Economics | 2 | 2 | 0 | 0 | 50 | 50 | 100 | 200 |
| BAG206 | Fundamentals of Plant Pathology | 4 | 3 | 1 | 20 | 30 | 50 | 100 | 400 |
| BAG207 | Fundamentals of Entomology | 4 | 3 | 1 | 20 | 30 | 50 | 100 | 400 |
| BAG208 | Fundamentals of Agricultural Extension Education | 3 | 2 | 1 | 20 | 30 | 50 | 100 | 300 |
| BAG209 | Communication Skills and Personality Development | 2 | 1 | 1 | 20 | 30 | 50 | 100 | 200 |
| Total | | | | | | | | | 2400 |
| C-Credit, L-Lecture, P-Practical, UT-Unit test, ESM: End semester marks, FM-Final marks (TXC) | | | | | | | | | |

| BAG 201: FUNDAMENTALS OF GENETICS | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 3 hr./ week (2+1) | Unit Test: 30 Marks |
| Tutorials: Nil | Practical marks: 20 Marks |
| Credits: 3 | End Semester Exam:50 Marks |

**Course Objectives:**

1. To study about mendelian concepts and principles of heredity.
2. To study the chromosome morphology, cell cycle and cell division.
3. To study the linkage and crossing over mechanisms
4. To give an overview on haploids and mutations.
5. To give the knowledge of protein synthesis, transcription and gene concepts.

**Syllabus**

**Theory**

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.

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. 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. 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**

Study of microscope. Study of cell structure. Mitosis and Meiosis cell division. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross, Experiments on epistatic interactions including test cross and back cross, Practice on mitotic and meiotic cell division, Experiments on probability and Chi-square test. Determination of linkage and cross-over analysis (through two point test cross and three point test cross data).Study on sex linked inheritance in Drosophila. Study of models on DNA and RNA structures.

**Text and Reference books:**

1.Singh, B.D. 2014. Fundamental of Genetics. Kalyani Publishing House, New Delhi.
2.Singh, B.D. 2001.Genetics. Kalyani Publishing House, New Delhi.
P. Singh. Genetics. Kalyani Publishing House, New Delhi.

**Course Outcomes:**

| **After completing the course, students will be able to:** |
|---|
| 1. Understand concepts and principles of heredity. |
| 2. Understand genetic architecture of chromosome and cell division (mitosis and meiosis) |
| 3. Understand gene concepts and its role in crop improvement |
| 4. Understand role of haploids and mutation on crop plants |
| 5. Understand qualitative & quantitative traits |
| 6. Understand about the transcription and translation process. |
| 7. Understand allele interaction and linkage and crossing over techniques |

| BAG 202: AGRICULTURAL MICROBIOLOGY | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 2 hr./ week (1+1) | Unit Test: 30 Marks |
| Tutorials: Nil | Practical marks: 20 Marks |
| Credits: 2 | End Semester Exam:50 Marks |

**Course Objectives:**

1. To study about prokaryotic and eukaryotic microbes.
2. To study the genetic recombination, conjugation, transduction, plasmids and transposon in bacterial cell.
3. To study the role of of microbes in soil fertility and crop production.
4. To give an overview on microbes in human welfare.

**Syllabus**

**Theory**

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

Role of microbes in soil fertility and crop production: Carbon, Nitrogen, Phosphorus and Sulphur cycles. Biological nitrogen fixation- symbiotic, associative and asymbiotic. Azolla, blue green algae and mycorrhiza. Rhizosphere and phyllosphere. Microbes in human welfare: silage production, biofertilizers, biopesticides, biofuel production and biodegradation of agro-waste.

**Practical**

Introduction to microbiology laboratory and its equipment's; Microscope- parts, principles of microscopy, resolving power and numerical aperture. Methods of sterilization. Nutritional media and their preparations. Enumeration of microbial population in soil-bacteria, fungi, actinomycetes. Methods of isolation and purification of microbial cultures. Isolation of *Rhizobium* from legume root nodule. Isolation of *Azotobacter* from soil. Isolation of *Azospirillum* from roots. Isolation of BGA. Staining and microscopic examination of microbes.

**Text and Reference books:**


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. 2010. IInd ed. Agricultural Microbiology. Prentice Hall of India Pvt. Limited, New Delhi


**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. Understand prokaryotic and eukaryotic microorganisms. |
| 2. Understand Bacteria cell structure chemoautotrophy and photo autotrophy |
| 3. Understand genetic recombination, conjugation, transduction, plasmids and transposon in bacterial cell. |
| 4. Understand carbon, nitrogen, phosphorus and Sulphur cycles |
| 5. Understand biological nitrogen fixation in soil fertility |
| 6. Understand role of biofertilizers, biopesticides and biofuel in human welfare. |

| BAG 203: SOIL AND WATER CONSERVATION ENGINEERING | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 2 hr./ week (1+1) | Unit Test: 30 Marks |
| Tutorials: Nil | Practical marks: 20 Marks |
| Credits: 2 | End Semester Exam:50 Marks |

**Course Objectives:**

1. To give complete knowledge and information about the subject.
2. To give an overview of different types of structure and design of conservation practices.
3. To explain the difference practices of soil and water conservation.
4. To describe all methods and practices of conservation.

**Syllabus**

**Theory**

Introduction to Soil and Water Conservation, causes of soil erosion. Definition and agents of soil erosion, water erosion: Forms of water erosion. Gully classification and control measures. Soil loss estimation by universal Loss Soil Equation. Soil loss measurement techniques. Principles of erosion control: Introduction to contouring, strip cropping. Contour bund. Graded bund and bench terracing. Grassed water ways and their design. Water harvesting and its techniques. Wind erosion: mechanics of wind erosion, types of soil movement. Principles of wind erosion control its control measures.

**Practical**

General status of soil conservation in India. Calculation of erosion index. Estimation of soil loss. Measurement of soil loss. Preparation of contour maps. Design of grassed water ways. Design of contour bunds. Design of graded bunds. Design of bench terracing system.Problem on wind erosion.

**Text and Reference Books**


1. Land and Water Management Engineering. 1982. Murthy V.V.N. Kalyani Pubhliers, New Delhi.
2. Principles of Agricultural. Engineering. Vol. II. 2012. Michael A.M. and T.P. Ojha. Jain Brothers, New Delhi.
3. Soil and Water Conservation Water Management. 2010. Mahnot, S.C., Singh P.K. and Chaplot, P.C.,. Apex Publication House, Udaipur.


**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. Understand the different types of soil and water conservation practices. |
| 2. Understand the design of conservation practices. |
| 3. Understand about the different terminology related to conservation practices. |
| 4. Understand the methods and practices for conservation approach. |

| BAG 204: FUNDAMENTALS OF CROP PHYSIOLOGY | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 2 hr./ week (1+1) | Unit Test: 30 Marks |
| Tutorials: Nil | Practical marks: 20 Marks |
| Credits: 2 | End Semester Exam:50 Marks |

**Course Objectives:**

1. To give complete knowledge and information about the subject
2. To give an overview of different types of pathways for growth of a plant.
3. To explain the nutrient requirement, its importance, function in a plant.
4. To describe the role of hormones in plant development.
5. To give the knowledge of the physical, chemical and biological functions of living plants.

**Syllabus**

**Theory**

Introduction to crop physiology and its importance in Agriculture; Plant cell: an Overview Diffusion and osmosis; Absorption of water, transpiration and Stomatal Physiology; Mineral nutrition of Plants: Functions and deficiency symptoms of nutrients, nutrient uptake mechanisms; Photosynthesis: Light and Dark reactions, C3, C4 and CAM plants; Respiration: Glycolysis, TCA cycle and electron transport chain; Fat Metabolism: Fatty acid synthesis and Breakdown; 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**

Study of plant cells, structure and distribution of stomata, imbibitions, osmosis, plasmolysis, measurement of root pressure, rate of transpiration. Separation of photosynthetic pigments through paper chromatography. Rate of transpiration, photosynthesis, respiration, tissue test for mineral nutrients, estimation of relative water content. Measurement of photosynthetic CO2 assimilation by Infra Red Gas Analyser (IRGA).

**Text and Reference books**


1. **S**. N. Pandey and B. K. Sinha (1995). Plant physiology.Vikas Publishing House Pvt. Ltd., new Delhi
2. L. Taiz and E. Zieger (2006). Plant Physiology. 4th Ed. Sinauer Associates.


**Course Outcomes:**

| After completing the course, students will be able to: |
|---|
| 1. Understand the functions of a living organism or any of its parts. |
| 2. Understand its importance in agriculture fields, medicine, food production and textiles. |
| 3. Understand about the physiologists can expect jobs at agricultural industries, manufacturing industries, public and private sectors. |

| BAG 205: FUNDAMENTALS OF AGRICULTURAL ECONOMICS | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 2 hr./ week (2+0) | Unit test : 50 Marks |
| Tutorials: Nil | End Semester Exam:50 Marks |
| Credits: 2 | |

**Course Objectives:**

1. To study about economics and its role in agriculture.
2. To study economic principles, with emphasis on their application to the solution of farm, agribusiness, and agricultural industry problems.
3. To study demand and supply theory and competitive environments.
4. To study about money and taxes.

**Syllabus**

**Theory**

***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.

***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. 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 socioeconomic determinants, current policies and programmes on population control.

**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.

**Text and Reference books:**


1. Bhavani Devi,P. Raghu Ram,S. SubbaReddy,T.V. Neelakanta Sastry, 2009, Agricultural economics, Oxford and IBH Co. Pvt. Ltd., , New Delhi.
2. K. K. Dewett and J. D. Varma, 1986, Elementary Economic Theory, S. Chand & Company, New Delhi.
3. Latika Sharma et al (2014) Principles of agricultural economics, Agrotech publishers, Udaipur.


**Course Outcomes:**

| **After completing the course, students will be able to:** |
|---|
| 1. Understanding agricultural set up and its financial management |
| 2. Understanding farm management |
| 3. Computation of economic and cost reduction |
| 4. Rationalizing agricultural inputs and practices |

| BAG 206: FUNDAMENTALS OF PLANT PATHOLOGY | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 4 hr./ week (3+1) | Unit Test: 30 Marks |
| Tutorials: Nil | Practical marks: 20 Marks |
| Credits: 4 | End Semester Exam:50 Marks |

**Course Objectives:**

1. To study about importance, scope Plant Pathology.
2. To study the biotic, abiotic and mesobiotic causes of plants disease.
3. To explain the Disease Triangle.
4. To give an overview of growth and reproduction of plant pathogens.
5. To study mechanism of disease development by the pathogens
6. To know the methods of managements of plant disease.

**Syllabus**

**Theory**

**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.

**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.

Bacteria and mollicutes: general morphological characters. Basic methods of classification and reproduction.

**Viruses**: nature, structure, replication and 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.)

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**

Acquaintance with various laboratory equipment's and microscopy. Collection and preservation of disease specimen. Preparation of media, isolation and Koch's postulates. General study of different structures of fungi.

Study of symptoms of various plant diseases. Study of representative fungal genera. Staining and identification of plant pathogenic bacteria. Transmission of plant viruses. Study of phanerogamic plant parasites. Study of morphological features and identification of plant parasitic nematodes. Sampling and extraction of nematodes from soil and plant material, preparation of nematode mounting. Study of fungicides and their formulations.

Methods of pesticide application and their safe use. Calculation of fungicide sprays concentrations.

**Text and Reference books:**


1. Chaube, H.S. and Pundhir, V.S.2005. Crop Disease and Their Management.PHI Learning Pvt. Ltd.
2. Singh, R.S.2007.Plant diseases. Medtech; 10 edition.
3. Singh, R.S. 2005. 4th ed. Principles of Plant Pathology. Oxford & IBH, New Delhi.
4. Nene, Y.L. 2015. Fungicides in Plant Diseases Control. Oxford & IBH published Co. Pvt. Ltd., New Delhi.


**Course Outcomes:**

| **After completing the course, students will be able to:** |
|---|
| 1. Understand various causes/ factors affecting plant disease. |
| 2. Understand interaction between plant and pathogen in relation to environment and time. |
| 3. Understand about the morphology and life cycle of different plant pathogenic organisms e.g. Fungi, Bacteria etc. |
| 4. Understand various sign and symptoms of Plant diseases. |
| 5. Understand defense mechanism in plants (how they protect themselves from the disease). |
| 6. Understand about the various principles and methods of plant disease management. |

| BAG 207: FUNDAMENTALS OF ENTOMOLOGY | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 4 hr./ week (3+1) | Unit Test: 30 Marks |
| Tutorials: Nil | Practical marks: 20 Marks |
| Credits: 4 | End Semester Exam:50 Marks |

**Course Objectives:**

1. To know about characteristics of class Insecta to dominate in Animal Kingdom
2. To know about morphology and physiology of Insects.
3. To explain about Environmental factors affecting insect life cycle and their infestation.
4. To give knowledge of different categories of pest and their recent methods of control.
5. To give detail account of concept, scope, practices and limitation of Integrated Pest Management

**Syllabus**

**Theory**

**Part – 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.

**Part-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.

**Part 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.

**Part – IV**

Systematics: Taxonomy –importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order. Classification of class Insectaupto 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, Papiloinidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidae, Bruchidae, Scarabaeidae; Hymenoptera: Tenthridinidae, Apidae.

Trichogrammatidae, lchneumonidae, Braconidae, Chalcididae; Diptera: Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae,Muscidae, Tephritidae.

**Practical**

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

**Text and Reference books:**

1.Chapman .R.F.1981. Insect Structure and Function, ELBS Publishers New Delhi.
2.K.N. Ragumoorthi, V. Balasubramani, M.R. Srinivasan.2017. Insecta An Introduction,A.E. Publications.
3. Mathur and Upadhyay, 2005. A Text Book of Entomology, Aman Publishing House, Meerut.
4. Pant. N.C. and Ghai, S. 1981. Insect Physiology and Anatomy, ICAR, New Delhi.

**Course Outcomes:**

**After completing the course, students will be able to:**

| |
|---|
| 1.Understand that due to the great diversity, remarkable adaptability and genetic flexibility of insects, made them dominant species on the Earth. |
| 2. Understand the characteristics of the phylum Arthropoda and class insecta. |
| 3. Able to understand economic importance of insects. |
| 4. Recognize the major taxonomic Orders of Insect and their key characteristics. |
| 5. Identify harmful insect pest and understand their morphology and physiology. |
| 6. Understand the concept, scope and limitation of IPM. |
| 7. Understand about various environmental factors affecting insects and their biology. |
| 8. Familiar about the pesticide and their use in the crops. |

| BAG 208: FUNDAMENTALS OF AGRICULTURAL EXTENSION EDUCATION | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 3 hr./ week (2+1) | Unit Test: 30 Marks |
| Tutorials: Nil | Practical marks: 20 Marks |
| Credits: 3 | End Semester Exam:50 Marks |

**Course Objectives:**

1. The course is intended to orient the students with the concept of extension education and its importance in agriculture development
2. Expose the students with various rural development programmes aimed at poverty alleviation
3. To know about the extension system worldwide and new dimensions of Agricultural Extension in India
4. To Understand dimensions and process of extension and programme planning

**Syllabus**

**Theory**

**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, Nilokheri Experiment, etc.); 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.

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; 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**

To get acquainted with university extension system. Group discussion- exercise; handling and use of audio visual equipment's and digital camera and LCD projector; preparation and use of AV aids, preparation of extension literature – leaflet, booklet, folder, pamphlet news stories and success stories. Presentation skills exercise; micro teaching exercise; A visit to village to understand the problems being encountered by the villagers/ farmers; to study organization and functioning of DRDA and other development departments at district level.Visit to NGO and learning from their experience in rural development; understanding PRA techniques and their application in village development planning; exposure to mass media: visit to community radio and television studio for understanding the process of programme production; script writing, writing for print and electronic media, developing script for radio and television.

**Text and Reference books:**

1.Adivi Reddy, A., 2001, Extension Education, Sree Lakshmi press, Bapatla.

2. Dahama, O. P. and Bhatnagar, O. P., 1998, Education and Communication for Development, Oxford and IBH publishing Co. Pvt. Ltd., New Delhi.

3. Jalihal, K. A. and Veera bhadraiah, V., 2007, Fundamentals of Extension Education and Management in Extension, Concept publishing company, New Delhi.

**Course Outcomes:**

| **After completing the course, students will be able to:** |
|---|
| 1.Learn different methods of agriculture technology transfer |
| 2. Methods to be conducted on farm research |
| 3. Bridging the gaps between farmers and researchers |
| 4. Getting feedback to improvise the research activities. |

| BAG 209: COMMUNICATION SKILLS AND PERSONALITY DEVELOPMENT | |
|---|---|
| **Teaching Scheme** | **Examination Scheme** |
| Lecture and Practical: 2 hr./ week (1+1) | Unit Test: 30 Marks |
| Tutorials: Nil | Practical marks: 20 Marks |
| Credits: 2 | End Semester Exam:50 Marks |

**Course Objectives:**

1. Develop awareness of appropriate communication strategies.
2. Prepare and present messages with a specific intent.
3. Analyze a variety of communication acts.
4. Ethically use, document and integrate sources.
5.Students will identify and explain their goals for the semester.
6. Identify the needs communication helps us meet.
7. Identify common misconceptions about communication
8. Explain communication competence
9. Identify the reasons we commit perceptual errors.
10. Identify the reasons people use language

**Syllabus**

**Theory**

Communication Skills: Structural and functional grammar; meaning and process of communication, verbal and nonverbal communication; listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures. Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations, impromptu presentation, public speaking; Group discussion. Organizing seminars and conferences.

**Practical**

Listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures. Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations.

**Text and Reference books:**

1.Sandhu, A. S. (1999). Textbook on Agricultural Communication; process and methods oxford RIBH Publishing co. Pvt. Ltd. New Delhi.

2. Berlo, David K. (1960). The process of Communication. NwYark, Holt, Rinehart and Winston Inc.

3. Dahama, O. P. and Bhatnagar, O.P., 1998, Education and Communication for Development, Oxford and IBH publishing Co. Pvt. Ltd., New Delhi.

4.Verma, K.C. 2013. The Art of Communication. Kalpaz.

5. Mohan Krishna and Meera Banerjee. 1990. Developing Communication Skills. Macmillan India Ltd. New Delhi.

6. Sharma R C and Krishna Mohan. 1978. Business Correspondence. Tata Mc Graw Hill

**Course Outcomes:**

| **After completing the course, students will be able to:** |
| --- |
| 1. .Students will be able to understand and apply knowledge of communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication etc. from multiple perspectives. |
| 2.Students will be able to understand and evaluate key theoretical approaches used in the interdisciplinary field of communication. I.e., students will be able to explain major theoretical frameworks, constructs, and concepts for the study of communication and language, summarize the work of central thinkers associated with particular approaches, and begin to evaluate the strengths and weaknesses of their approaches. |
| 3.Students will be able to find, use, and evaluate primary academic writing associated with the communication discipline. |
| 4. Students will develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others. Such skills could include communication competencies such as managing conflict, understanding small group processes, active listening, appropriate self-disclosure, etc. |
| 5.. Students will be able to communicate effectively orally and in writing. |