BAGSOIL202 Soil Fertility Management

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGSOIL 202	Soil Fertility Management	40	20	20	20	00	2	1	3(2+1)

Legends: **L** - Lecture; **P** – Practical; **C**-Credit;

*__Teacher Assessment__ shall be based on following components: Quiz / Assignment / Project /Participation in Class,

Objective: To provide a comprehensive knowledge of soil fertility, plant nutrition, fertilizers, and nutrient management

Course Outcomes:

1. Student will able to understand the how to management of soil fertility
2. Student will able to understand method of fertilizer application

Unit-1: History of soil fertility and plant nutrition. criteria of essentiality. role, deficiency and toxicity symptoms of essential plant nutrients, Mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants.

Unit-2: Chemistry of macro and micronutrients. Soil fertility evaluation, Soil testing. Critical levels of different nutrients in soil. Forms of nutrients in soil, plant analysis, rapid plant tissue tests. Indicator plants. Introduction and importance of manures and fertilizers. Fertilizer recommendation approaches.

Unit-3: Integrated nutrient management. Chemical fertilizers: classification, composition and properties of major fertilizers, secondary and micronutrient fertilizers, Complex fertilizers, Customised fertilisers, water soluble fertilizers nano fertilizers Soil amendments, Fertilizer Storage, Fertilizer Control Order.

Unit-4 Methods of fertilizer recommendations to crops. Factor influencing nutrient use efficiency (NUE), methods of application under rainfed and irrigated conditions.

Unit-5: STCR/RTNM/ IPNS, Carbon sequestration and Carbon Trading, Preparation and properties of major manures (FYM, Compost, Vermicompost, Green manuring, Oilcakes).

Practical:

Introduction of analytical instruments and their principles, calibration and applications of Coloremetry and flame photometry; Estimation of alkaline hydrolysable N in soils; Estimation of soil extractable P in soils; Estimation of exchangeable K in soils; Estimation of exchangeable Ca and Mg in soils; Estimation of soil extractable S in soils; Estimation of DTPA extractable Zn in soils; Estimation of N in plants; Estimation of P in plants; Estimation of K in plants; Estimation of S in plants.

Suggested Readings

1. Introductory Soil Science by Dilip Kumar Das, Kalyani Publishers
2. Soil Fertility and Nutrient Management by S. S. Singh, Kalyani Publishers
3. Soil Fertility and Fertilizers by Samual L. Tisdale, Werner L. Nelson and James D. Beaton, Macmillan Publishing Company, New York
4. The nature and Properties of Soils by Harry O. Buckman and Nyle C.

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BAGAGM201: Environmental Studies and Disaster Management

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGAGM201	Environmental Studies and Disaster Management	40	20	20	20	00	2	1	3(2+1)

Legends: **L** - Lecture; **P** – Practical; **C**-Credit;

*__Teacher Assessment__ shall be based on following components: Quiz / Assignment / Project /Participation in Class,

Course Objective: To expose and acquire knowledge on the environment and to gain the state-of-the-art - skill and expertise on management of disasters

Course Outcomes:

1. Student will able to understand scope and importance of environmental studies
2. Student will able to understand Natural Disasters and it`s management

Unit-1: Introduction to Environment - Environmental studies: Definition, scope and importance - Multidisciplinary nature of environmental studies - Segments of Environment - Spheres of Earth - Lithosphere - Hydrosphere - Atmosphere - Different layers of atmosphere. Natural Resources: Classification - Forest resources. Water resources. Mineral resources Food resources. Energy resources. Land resources. Soil resources.

Unit-2: Ecosystems: Concept of an ecosystem - Structure and function of an ecosystem - Energy flow in the ecosystem. Types of ecosystem. Biodiversity and its conservation: Introduction, definition, types. Biogeographical classification of India. Importance and Value of biodiversity. Biodiversity hot spots. Threats and Conservation of biodiversity.

Unit-3: Environmental Pollution: Definition, cause, effects and control measures of: a. Air pollution. b. Water pollution. c. Soil pollution. d. Marine pollution. e. Noise pollution. f. Thermal pollution h. Light pollution. Solid Waste Management: Classification of solid wastes and management methods, Composting, Incineration, Pyrolysis, Biogas production, Causes, effects and control measures of urban and industrial wastes. Social Issues and the Environment: Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Environmental ethics: Issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

Unit-4: Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Human Population and the Environment: Environment and human health: Human Rights, Value Education. Women and Child Welfare. Role of Information Technology in Environment and human health.

Unit-5: Disaster management: Disaster definition - Types - Natural Disasters - Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves. Man Made Disasters: Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest f ire, oil fire, road accidents, rail accidents, air accidents, sea accidents. International and National strategy for disaster reduction. Concept of disaster

management, national disaster management framework; financial arrangements; role of NGOs, community-based organizations and media in disaster management. Central, state, district and local administration in disaster control; Armed forces in disaster response; Police and other organizations in disaster management.

Practical:

Visit to a local area to document environmental assets river/forest/grassland/hill/mountain. Energy: Biogas production from organic wastes. Visit to wind mill / hydro power / solar power generation units. Biodiversity assessment in farming system. Floral and faunal diversity assessment in polluted and un polluted system. Visit to local polluted site - Urban/Rural/Industrial/Agricultural to study of common plants, insects and birds. Environmental sampling and preservation. Water quality analysis: pH, EC and TDS. Estimation of Acidity, Alkalinity. Estimation of water hardness. Estimation of DO and BOD in water samples. Estimation of COD in water samples. Enumeration of E. coli in water sample. Assessment of Suspended Particulate Matter (SPM). Study of simple ecosystem – Visit to pond/river/hills. Visit to areas affected by natural disaster.

Suggested readings

1. De, A.K. 2010. Environmental chemistry. Published by New Age International Publishers, New Delhi. ISBN:13–978 81 224 2617 5. 384 pp
2. Dhar Chakrabarti, P.G. 2011. Disaster management - India's risk management policy frameworks and key challenges. Published by Centre for Social Markets (India), Bangalore. 36 pp. Carnegie Dale. 1997. The Quick and Easy Way to Effective Speaking. Pocket Books, New York.
3. Erach Bharucha, Text book for Environmental studies. University Grants Commission, New Delhi
4. Parthiban, K.T. Vennila, Prasanthrajan, S., Umesh, M. and Kanna, S. 2023. Forest, Environment, Biodiversity and Sustainable development. Narendra Publishing House, New Delhi, India. (In Press).
5. Prasanthrajan M. and Mahendran, P.P. 2008. A text book on Ecology and Environmental Science. ISBN 81-8321-104-6. Agrotech Publishing Academy, Udaipur - 313 002. First Edition: 2008
6. Prasanthrajan M. 2018. Objective environmental studies and disaster management. ISBN 9789387893825. Scientific publishers, Jodhpur, India. Pp. 146.
7. Sharma, P.D. 2009. Ecology and Environment, Rastogi Publications, Meerut, India
8. Tyler Miller and Scot Spoolman. 2009. Living in the Environment (Concepts, Connections, and Solutions). Brooks/cole, Cengage learning publication, Belmont, USA

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BAGPATH201: Fundamentals of Plant Pathology

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGPATH201	Fundamentals of Plant Pathology	40	20	20	20	00	2	1	3(2+1)

Legends: **L -** Lecture; **P** – Practical; **C**-Credit;

*__Teacher Assessment__ shall be based on following components: Quiz / Assignment / Project /Participation in Class,

Objective:

1. To get acquainted with the role of different microorganisms in the development of plant disease
2. To get general concepts and classification of plant diseases
3. To get knowledge of general characteristics of fungi, bacteria, virus, and other microorganisms causing plant diseases
4. To acquaint the students with reproduction in fungi, and bacteria, causing plant diseases
5. To get acquainted with various plant disease management principles and practices

Course Outcomes

1. Student will able to understand importance of microbiology for the crop improvement
2. Student will able to understand different diseases of plant and it`s cause

Unit-1 Introduction to Plant Pathology: Concept of disease in plants; Different terms used in Plant Pathology, History of Plant Pathology with special references to India;

Unit-2 Causes of plant disease: Inanimate and animate causes; Classification of plant disease; Parasitism and pathogenesis; Development of disease in plants: Disease Triangle, Disease cycle; Fungi and their morphology, reproduction and classification of fungi;

Unit-3 Bacteria: Morphology, reproduction classification of phytopathogenic bacteria; Other plant pathogens: Mollicutes; Flagellant protozoa; FVB.

Unit-4 Green algae and parasitic higher plants; Viruses and viroids, virus transmission

Unit-5 Principles of Plant disease management: Disease management with chemicals, Host resistance, cultural and biological method of Integrated Disease Management (IDM).

Practical

Study of the microscope; Acquaintance with laboratory material and equipment; Study of different plant disease symptoms; Microscopic examination of general structure of fungi; Simple staining of bacteria: Direct and indirect staining, Gram staining of bacteria; Microscopic examination of fungal diseased specimen; Microscopic examination of bacterial diseased specimen; Preparation of culture media; Isolation of plant pathogens: Fungi, bacteria and viruses; Purification of plant pathogens; Study on plant disease diagnosis: Koch’s

Postulates, Characteristics, formulation, methods of application and calculation on fungicides.

Suggested readings

1. Agrios, G.N. 2010. Plant Pathology. Acad. Press
2. Alexopoulos, Mims and Blackwel. Introductory Mycology
3. Dhingra, O.D. and Sinclair, J.B. 1986. Basic Plant Pathology Methods. CRC Press, London, Tokyo.
4. Gibbs, A. and Harrison, B. 1976. Plant Virology - The Principles. Edward Arnold, London
5. Goto, M. 1990. Fundamentals of Plant Bacteriology. Academic Press, New York.
6. Hull R. 2002. Mathew's Plant Virology. 4th edn. Academic Press, New York.
7. Hull R. 2002. Mathew's Plant Virology. 4th edn. Academic Press, New York.
8. Mehrotra, R.S. and Aggarwal, A. 2007. Plant Pathology. 7th edn. Tata Mc Graw Hill Publ. Co. Ltd.
9. Nene, Y.L. and Thapliyal, P.N. 1993. Fungicides in Plant Disease Control. 3rd Ed. Oxford & IBH, New Delhi.
10. Pathak, V. N. Essentials of Plant Pathology. Prakash Pub., Jaipur
11. Rajeev, K. and Mukherjee, R.C. 1996. Role of Plant Quarantine in IPM. Aditya Books.
12. Rhower, G.G. 1991. Regulatory Plant Pest Management. In: Handbook of Pest Management in Agriculture. 2nd edn. Vol. II. (Ed. David Pimental). CRC Press.
13. Singh R.S. 2008. Plant Diseases. 8 th Ed. Oxford & IBH. Pub. Co.
14. Singh R.S. 2013. Introduction to Principles of Plant Pathology. Oxford and IBH Pub. Co.
15. Verma, J.P. 1998. The Bacteria. Malhotra Publ. House, New Delhi.
16. Vyas SC. 1993. Handbook of Systemic Fungicides. Vols. I-III. Tata McGraw Hill, New Delhi.

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BAGENT201: Fundamentals of Entomology

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGENT201	Fundamentals of Entomology	40	20	20	20	00	2	1	3(2+1)

Legends: **L** - Lecture; **P** – Practical; **C**-Credit;

*__Teacher Assessment__ shall be based on following components: Quiz / Assignment / Project /Participation in Class,

Objective:

1. To know the history of entomology, classification of insects and their relationship with other arthropods
2. To study the various morphological characters of class insect and their importance for classification of insects
3. To get an idea about the different physiological systems of insects and their roles in growth and development and communications of insects
4. To study the characteristics of commonly observed insect orders and their economically important families

Course Outcomes

1. Student will able to understand Insects and pest effect on plants
2. Student will able to understand classification of different insects

Unit-1 History of Entomology in India. Major points related to dominance of Insects in Animal kingdom. Classification of phylum Arthropoda up to classes. Relationship of class Insects 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. Metamorphosis and diapause in insects. Types of larvae and pupae.

Unit-2 Structure and functions of digestive, circulatory, excretory, respiratory, nervous, secretary (Endocrine) and reproductive system, in insects. Types of reproduction in insects. Major sensory organs. Insect Ecology: Introduction, Environment and its components.

Unit-3 Effect of abiotic factors and biotic factors. Categories of pests. Systematics: Taxonomy – importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order.

Unit-4 Classification of class Insecta up to Orders, basic groups of present day insects with special emphasis to orders and families of Agricultural importance like Orthoptera: Acrididae, Tettigoniidae, Gryllidae, Gryllotalpidae; Dictyoptera: Mantidae, Blattidae; Odonata; Isoptera: Termitidae; Thysanoptera: T hripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae, Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidae, Aleurodidae, Pseudococcidae;

Unit-5 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); 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.

Suggested readings

1. Fundamentals of Ecology - Eugene. P. Odum and Gray W. Barrett
2. Imm's General Text book of Entomology— O.W. Rechards and R.G. Davies
3. Introduction to the study of Insects –D. J. Borror and DeLong's

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BAGEXT204: Personality Development

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGEXT204	Personality Development	40	20	20	20	0	1	1	2(1+1)

Legends: **L** - Lecture; **P** – Practical; **C**-Credit;

*__Teacher Assessment__ shall be based on following components: Quiz / Assignment / Project /Participation in Class,

Objective: To make students realize their potential strengths, cultivate their inter-personal skills and improve employability.

Course Outcomes:

1. Student will able to understand English meaning and grammar
2. Student will able to understand way of presentation and speaking in English

Unit-1 Personality Definition, Nature of personality, theories of personality and its types

Unit-2 The humanistic approach - Maslow's self-actualization theory, shaping of personality, determinants of personality, Myers-Briggs Typology Indicator, Locus of control and performance, Type A and Type B Behaviours, personality and Organizational Behaviour.

Unit-3 Foundations of individual behavior and factors influencing individual behavior, Models of individual behavior, Perception and attributes and factors affecting perception, Attribution theory and case studies on Perception and Attribution.

Unit-4 Attribution Learning: Meaning and definition, theories and principles of learning, Learning and organizational behavior, Learning and training, learning feedback.

Unit-5 Attitude and values, Intelligence- types of Intelligence, theories of intelligence, measurements of intelligence, factors influencing intelligence, intelligence and Organizational behavior, emotional intelligence. Motivation- theories and principles, Teamwork and group dynamics

Practical:

MBTI personality analysis, Learning Styles and Strategies, Motivational needs, Firo-B, Interpersonal Communication, Teamwork and team building, Group Dynamics, Win-win game, Conflict Management, Leadership styles, Case studies on Personality and Organizational Behavior.

Suggested readings

1. Andrews, Sudhir. 1988. How to Succeed at Interviews. 21st (rep.) New Delhi. Tata McGraw Hill.

2. Heller, Robert. 2002. Effective Leadership. Essential Manager series. Dk Publishing.

3. Hindle, Tim. 2003. Reducing Stress. Essential Manager series. Dk Publishing.

4. Lucas, Stephen. 2001. Art of Public Speaking. New Delhi. Tata - Mc-Graw Hill.

5. Mile, D.J. 2004. Power of Positive Thinking. Delhi. Rohan Book Company.

6. Pravesh Kumar. 2005. All about Self- Motivation. New Delhi. Goodwill Publishing House.

7. Smith, B. 2004. Body Language. Delhi: Rohan Book Company.

8. Shaffer, D. R. 2009. Social and Personality Development (6th Edition). Belmont, CA: Wadswor.

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BAGLPM201: Livestock and Poultry Management

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGLPM201	**Livestock and poultry Management**	40	20	20	20	00	1	1	2(1+1)

Legends: **L** - Lecture; **P** – Practical; **C**-Credit;

*__Teacher Assessment__ shall be based on following components: Quiz / Assignment / Project /Participation in Class,

Objectives:

1. Provide basic knowledge to the students about scientific livestock and poultry rearing practices
2. Entrepreneurship development through Livestock/poultry and Agriculture Integrated Farming System

Course Outcomes:

1. Student will able to understand role of livestock in agriculture economy
2. Student will able to able to learn management livestock and poultry

Unit-1 Role of livestock in the national economy, Reproduction in farm animals and poultry, Housing principles, space requirements for different species of livestock and poultry

Unit-2 Management of calves, growing heifers and milch animals, Management of sheep, goat and swine. Incubation, hatching and brooding, Management of growers and layers

Unit-3 Important Indian and exotic breeds of cattle, buffalo, sheep, goat, swine and poultry

Unit-4 Improvement of farm animals and poultry. Digestion in livestock and poultry, Classification of feedstuffs, proximate principles of feed, Nutrients and their functions, Feed ingredients for ration for livestock and poultry. Feed supplements and feed additives. Feeding of livestock and poultry

Unit-5 Introduction of livestock and poultry diseases, Prevention (including vaccination schedule) and control of important diseases of livestock and poultry.

Practical:

External body parts of cattle, buffalo, sheep, goat, swine and poultry. Handling and restraining of livestock. Identification methods of farm animals and poultry. Visit to IDF and IPF to study breeds of livestock and poultry and daily routine farm operations and farm records. Judging of cattle, buffalo and poultry. Culling of livestock and poultry. Planning and layout of housing for different types of livestock. Computation of rations for livestock. Formulation of concentrate mixtures. Clean milk production, milking methods. Hatchery operations, incubation and hatching equipment. Management of chicks, growers and layers.

Debeaking, dusting and vaccination. Economics of cattle, buffalo, sheep, goat, swine and poultry production

Suggested readings

1. A Textbook of Animal Husbandry by G. C Banerjee
2. A text Book of Livestock Production management in Tropic by D. N. Verma

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BAGSECSOIL203: Soil, Plant and Water Testing

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGSEC SOIL203	Soil, Plant and Water Testing	00	30	20	50	00	2	1	2(0+2)

Legends: **L** - Lecture; **P** – Practical;

*__Teacher Assessment__ shall be based on following components: Quiz / Assignment /Project /Participation in Class,

Objective:

- To impart practical skills in testing soil, plant, and irrigation/drinking water quality.
- To train students in nutrient analysis, soil health interpretation, and water quality diagnosis.
- To familiarize students with working protocols of soil testing and water analysis laboratories.
- To develop competency for employment in soil testing labs, fertilizer industry, and extension services

Course Outcomes:

- Collect and prepare soil, plant, and water samples for laboratory analysis.
- Perform chemical analyses for major and micronutrients.
- Use essential laboratory instruments (pH meter, EC meter, spectrophotometer, flame photometer).
- Interpret analytical data for soil fertility and irrigation water quality.
- Prepare soil health cards and suggest nutrient management recommendations.

UNIT I: Sampling and Sample Preparation

1. Principles of soil sampling—tools, depth, number of samples.
2. Collection, processing, drying, grinding, and sieving of soil samples.
3. Plant sampling—diagnostic leaves, stage of sampling, sample washing.
4. Water sampling—bottle preparation, preservation, and storage.
5. Composite sampling and avoidance of contamination.

UNIT II: Basic Soil Analysis

1. Determination of soil pH using pH meter.
2. Measurement of electrical conductivity (EC).
3. Estimation of soil organic carbon (Walkley & Black method).
4. Chemical analysis for:
    - **Available Nitrogen** (Alkaline $KMnO_4$ method)
    - **Available Phosphorus** (Olsen/Bray depending on soil pH)
    - **Available Potassium** (Flame photometer method)
5. Texture determination by hydrometer method.
6. Bulk density and particle density (demonstration).

UNIT III: Plant Analysis

1. Dry ashing and wet digestion of plant samples.
2. Estimation of total nitrogen (Kjeldahl method).
3. Estimation of total phosphorus (vanadomolybdate/yellow colour method).
4. Estimation of total potassium (flame photometry).
5. Diagnosis of nutrient deficiency through critical limits & sufficiency ranges

UNIT IV: Water Quality Analysis

1. Determination of pH, EC, total dissolved solids (TDS).
2. Alkalinity determination (CO_3^{2-} and HCO_3^-).
3. Calcium and magnesium by EDTA.
4. Sodium by flame photometry.
5. Calculation of:
    - Residual Sodium Carbonate (RSC)
    - Sodium Adsorption Ratio (SAR)
    - Exchangeable Sodium Percentage (ESP)
    - Permeability Index (PI)
6. Classification of irrigation water quality (USSL, WHO).

UNIT V: Reporting and Interpretation

1. Preparation of soil health cards as per GOI guidelines.
2. Fertilizer recommendation based on soil test values.
3. Interpretation of plant analysis values.
4. Irrigation suitability interpretation based on SAR, RSC, EC.
5. Laboratory record maintenance, calibration, and troubleshooting.

Suggested Readings:

Kanwar, J.S. & Chopra, S.L. (2015). *Analytical Agricultural Chemistry*. Kalyani Publishers.
Sarkar, D. & Haldar, A. (2005). *Physical and Chemical Methods in Soil Analysis*. New Age International.
Gupta, P.K. (2019). *Soil, Plant, Water and Fertilizer Analysis*. Agrobios India.

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BAGSECENG204: Food Processing

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGSEC ENG204	Food Processing	00	30	20	50	00	2	1	2(0+2)

Legends: **L** - Lecture; **P** – Practical;

*__Teacher Assessment__ shall be based on following components: Quiz / Assignment /Project /Participation in Class,

Objective:

- To familiarize students with basic food processing operations, machinery, and safety procedures.
- To develop hands-on skills in the preparation, preservation, and packaging of food products using simple equipment.
- To encourage understanding of hygiene, quality standards, and small-scale processing feasibility.

Course Outcomes:

- Students will understand lab safety, hygiene, and basic operation of food processing equipment.
- Students will gain knowledge of basic fruit and vegetable processing techniques and thermal preservation.
- Students will acquire skills to process cereal-based snacks and bakery products using simple setups.
- Students will learn small-scale dairy processing and quality control methods.
- Students will understand packaging, labeling, storage standards, and get exposure to real processing environments.

UNIT I

- Introduction to food processing, safety rules, and lab hygiene.
- Familiarization with food processing laboratory layout and SOPs.
- Study of basic food processing equipment: mixer, grinder, dehydrator, tray dryer/solar dryer, and hand sealing machine.
- Measurement of moisture content and determination of drying rate of food materials.

UNIT II

- Study of fruit pulper and juice extractor.
- Demonstration of blanching and boiling of vegetables.
- Study of sterilization and pasteurization process (demonstration-based).

- Equipment focus: pasteurizer, milk can, stainless steel vessel, digital thermometer, pH meter, refractometer, honey extractor.

UNIT III

- Preparation of roasted/puffed snacks (using roaster or sand roasting).
- Preparation of bakery items such as biscuits or cake using oven.
- Understanding heat transfer and moisture control during baking and roasting.

UNIT IV

- Preparation of paneer and khoa.
- Preparation of flavored milk or curd.
- Study of pasteurization principles related to dairy processing.
- Use of digital thermometer and pH meter for process control.

UNIT V

- Study of various food packaging materials (plastic, glass, metal, paper).
- Packaging and labeling of prepared products as per FSSAI norms.
- Study of storage and shelf life of one selected product.
- Visit to local food processing and packaging/cold storage unit and preparation of short report.

Suggested Readings:

- Sivasankar, B. (2014). *Food Processing and Preservation.* PHI Learning.
- Ranganna, S. (2010). *Handbook of Analysis and Quality Control for Fruit and Vegetable Products.* Tata McGraw Hill.
- Fellows, P.J. (2017). *Food Processing Technology: Principles and Practice.* Woodhead Publishing.
- FSSAI Manuals & Guidelines.
- NIAM, ICAR. *Entrepreneurship in Food Processing.*

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BAGNSS102: National Service Scheme (NSS-II)

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
BAGNSS102	National Service Scheme (NSS-II)	00	30	20	50	0	2	1	3(0+1)

Legends: **L -** Lecture; **P** – Practical; **C**-Credit;
*__Teacher Assessment__ shall be based on following components: Quiz / Assignment / Project /Participation in Class

Course Outcomes

1. Student will able to understand Importance and role of youth leadership
2. Student will be trained in NCC/NSS

National Service Scheme (NSS-II)

- Importance and role of youth leadership
- Meaning, types and traits of leadership, qualities of good leaders; importance and roles of youth leadership, Life competencies
- Definition and importance of life competencies, problem-solving and decision-making interpersonal communication. Youth development programs
- Development of youth programs and policy at the national level, state level and voluntary sector; youth-focused and youth-led organizations
- Health, hygiene and sanitation. Definition needs and scope of health education; role of food, nutrition, safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan) for health; national health programs and reproductive health. Youth health, lifestyle, HIV AIDS and first aid. Healthy lifestyles, HIV AIDS, drugs and substance abuse, home nursing and first aid. Youth and yoga. History, philosophy, concept, myths, and misconceptions about yoga; yoga traditions and its impacts, yoga as a tool for healthy lifestyle, preventive and curative method.

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