

CHEMISTRY

Skill Based Elective I (Semester IV)

FOOD AND NUTRITION

OBJECTIVES

- To learn the importance of food and nutrition.
- To know the chemical composition and importance of balanced diet.
- To learn the food adulterants and identification of them.

UNIT I: FOOD, NUTRITION AND HEALTH

The meaning of food, nutrition, nutritional care and health-nutritional problems in India

UNIT II: BIOLOGICAL IMPORTANCE OF FOOD

Nutritional classification of food-nutrients as body constituents-digestion and absorption of food. Types of food, caloric content and dieting

UNIT III: BASIC CHEMICAL CONSTITUENTS OF FOOD

Biological functions of carbohydrates, proteins, fats, vitamins, minerals and water

UNIT IV: FOOD ADULTERATION TESTING

Common adulterants in food-testing methods of all food adulterants (Ghee, Chilli powder, Oil, Milk, Turmeric powder)

UNIT V: HEALTH PROBLEMS OF FOOD ADULTERATION

Principal adulterants and its effect on health.

REFERENCES

1. Alex Ramani V, Food Chemistry, MJP Publishers, Triplicane, Chennai, 2009
2. Thangamma Jacob, Food adulteration, Macmillan company of India limited, New Delhi, 1976
3. Jeyaraman J, Laboratory manual in biochemistry, Wiley Eastern limited, New Delhi, 1981

Skill Based Elective II (Semester V)

AGRICULTURAL CHEMISTRY

OBJECTIVES

- To know the properties of soil and the importance of plant nutrients.
- To know the significance of fertilizers and pesticides.

UNIT I : ORIGIN OF SOIL

Origin of soils, their properties, acid, alkali and saline soils- diagnosis – remediation of acid and salt affected soils – methods of reclamation and after care.

UNIT II : CHEMISTRY ASPECTS OF SOIL

Soil testing – concept, objectives and basis – soil sampling, tools, collection processing, despatch of soil samples – soil organic matter – its decomposition and effect on soil fertility.

UNIT III: PLANT NUTRIENTS

Plant nutrients – macro and micro nutrients – their role in plant growth – sources - forms of nutrient absorbed by plants – factors affecting nutrient absorption - deficiency symptoms in plants – corrective measures – chemicals used for correcting nutritional deficiencies – nutrient requirement of crops – their availability fixation and release of nutrients.

UNIT IV: FERTILIZERS

Fertilizers – classification of NPK fertilizers – sources - natural and synthetic – straight – complex – liquid fertilizers, their properties, use and relative efficiency secondary and micronutrient fertilizers – mixed fertilizers.

UNIT V : PESTICIDES AND FUNGICIDES

Pesticides : definition – Classification – organic and inorganic pesticides – mechanism of action – characteristics safe handling of pesticides – impact of pesticides on soil, plants and environment.

Fungicides : Definition – Classification – mechanism of action – sulphur, copper, mercury compounds, dithanes, dithiocarbamate.

REFERENCES

1. Biswas T.D and Mukherjee S.K. Text book of soil science 1987.
2. Daji A.J. A text book of soil science, Asia publishing House, Madras – 1970.
3. Tisdale S.L. Nelson W.L. and Beaton J.D. Soil fertility and fertilizers, Macmillon Pub Co New York 1990.
4. Hesse P.R, A text book of soil chemical analysis John Murray, NewYork, 1971.
5. Buchel K.H, Chemistry of Pesticides, John Wiley & Sons New York 1983.
6. Sree Ramulu V.S Chemistry of Insecticides and Fungicides, Oxford and IBH Publishing Co., New Delhi 1979.

Skill Based Elective III (Semester V)

DYEING TECHNIQUES AND WATER TREATMENT

OBJECTIVES

- To develop the skills in dyeing.
- To understand the water qualities and treatments.
- To know the sewage treatments.

UNIT-I

- 1.1. Textile fiber pretreatments: Sizing and desizing, purpose, desizing methods (Hot water, Acid and enzymatic) - their merits and demerits - Scouring: classification, method of Kier boiling process.
- 1.2 Dye chemistry: Witt's theory of colour –important dye stuff intermediates- their names- Difference between dye and pigments.
- 1.3. Chromophore – auxo chromes –batho chromic shift and hypso chromic shift -classification of dyes based on application.

UNIT-II

- 2.1 Technical terms in dyeing: M.L. ratio – % of shade – % of exhaustion – equilibrium absorption.
- 2.2 Dyeing machineries: Description and uses of Padding mangle and Jigger.
- 2.3. Textile dyeing processes I: Direct cotton dyeing – effect of temperature, Acid dyeing – effect of electrolytes in acid dyeing.

UNIT-III

- 3.1 Textile dyeing processes II: Vat dyeing, Pre – mordant dyeing, Post – mordant dyeing.
- 3.2 Fastness properties – Definition of Light, Washing Rubbings, Perspiration and sublimation fastness - Evaluation procedures for Light and Washing fastness.

UNIT-IV

- 4.1. Sewage & Domestic wastes and their effects - concepts of BOD and COD.
- 4.2. Eutrophication and their effects - Biological magnification.
- 4.3 Water treatment methods: General methods of water treatment – Sewage treatment methods: preliminary, Primary, Secondary, Tertiary treatments.

UNIT-V

- 5.1. Industrial effluents: Nature of effluents of Chemical, Food, Drug and material industries.

- 5.2. Industrial waste water treatment: preliminary, Primary, Secondary (Biological) treatment. Aerobic process (Lagooning, Trickling Filters, activated Sludge, oxidation ditch).
- 5.3. Anaerobic digestion - advantages of Anaerobic process - Disposal of sludge – draw backs and effective steps and Tertiary treatments (adsorption, ion-exchange and ultra-filtration).

REFERENCES

FOR UNITS I TO III

1. Venkataraman . K. The chemistry of synthetic dyes Vol, I, II, III & IV-, Academic Press N.Y., 1949.
2. Shenai, V.A. ,Chemistry of Textile fibres, vol.I, Sevak publication , Mumbai
3. Shenai, V.A. ,Chemistry of Dyes and Principles of dyeing , vol.II, Sevak publication, Mumbai

FOR UNITS IV & V

4. H.Kaur “Environmental Chemistry” 7th Edition, Pragati Prakashan publisher, 2013
5. A.K.De “Environmental Chemistry” 3rd Edition ,New Age International (P) Ltd.Publisher,1997.
