4267 - ELEMENTARY FOOD ANALYSIS

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
Lectures	Practical	Credits			Theory		Practical Ex.	Total
2	4	6	25	25	3Hrs	100	50	200

Pre-requisite	Source
4263	FOD

Semester	Theory	Test	Total	TW	PR	Gr Total	
	75	25	100	50	50	200	

Rationale: The technologist in a food industry is expected to supervise production or implement quality control procedures or take up both these functions. Analysis of raw material, intermediate product, food additives, packaging material and final product is one of the most important tasks of meaningful quality control. With this in view, the course in food analysis has been devised to cover the basic principles of important analytical techniques used In food industries along with extensive practical work to develop necessary skills and accuracy in each of these techniques. A few items in Indian food may be also taken for analysis.

COURSE CONTENT	Hrs	Mks
1. INTRODUCTION Purpose of food analysis: Determination of proximate composition and nutritive value of food composite. Detect food adulteration and presence of toxic components, extraneous matter in food. Quality control of raw material, intermediate product and final product.	2	6
2. DETERMINATION OF PROXIMATE COMPOSITION Principles of following analyses: Determination of moisture content and ash content of food (total ash, acid soluble, and insoluble ash and alkalinity of ash). Determination of crude protein by Kjeldahl method. Determination of crude fat by Soxhlet method. Determination of crude fibre in food sample. Determination of total sugar, reducing and non-reducing sugar in food. Determination of starch content of food by hydrolysis.	5	16
3. DETECTION OF ADULTERATION Definition of adulteration. Detection of adulteration in tea, coffee, oils and fats, spices by simple, physical and chemical methods and visual examination.	4	15
4. VOLUMETRIC ANALYSIS Principle of acid-base titration. Principle of oxidation – reduction titration. Principle of iodometry	4	15
5. COLORIMETRIC ESIMATIONS Principles of colorimetry. Absorption, transmission and reflections of light through liquid media. Statement of Beer's Law and Lambert's Law and mathematical expression of the law. Main components of colorimeter and their functions. Procedure followed in colorimetric estimation (taking example of Biuret method for protein estimation).	6	16
6. CHROMATOGRAPHY Principle of chromatographic techniques. Components of chromatographic techniques- Inert phase, stationary phase, mobile phase. Definition of Rf value and calculation. Types of chromatography (outline of each techniques)- Paper chromatography, thin layer chromatography, column chromatography, gas-liquid chromatography. Paper chromatography: Procedure used for analytical work: Type of paper used, preparation of sample, spotting, chromatographic chamber, solvents, types of paper chromatography- Ascending and descending chromatography, two dimensional chromatography, circular paper chromatography.	6	16

7. INSTRUMENTAL METHODS OF ANALYSIS Determination of colour using Munsell Disc Colorimeter- Definition of colour. Factors affecting colour perception. Munsell system of colour description (hue, value and chroma). Working of Munsell Disc Colorimeter. Determination of consistency of liquid food products- Definition of rheology, consistency. Principle of measurement of consistency on basis of flow through a capillary tube, flow through an orifice, falling weight, rotation of spindle or cylinder in test material, rotation of test material around a spindle or cylinder, power consumption, penetration into test material, spread or flow of material, continuous viscosity measurement.	5	16
Total	32	100

PRACTICALS

1) Determination of preservatives in food sample- Determination of sulphur dioxide content c squash and preserved pulp. Determination of benzoic acid in tomato product.
2) Determination of calcium in food by volumetric analysis.
3) Determination of crude fat by Soxhlet method.
4) Detection of adulteration in food sample- Spices (chilli powder, pepper, turmeric), Oils and fats.
5) Analysis of coffee (moisture, solubility, water soluble ash, alkalinity of soluble ash)
6) Microscopic study of starch for structure of granules.
7) Estimation of total sugar, reducing and non-reducing sugar by Lane-Eynon Method.
8) Paper Chromatography (detection of various sugars in mixture)
9) Determination of iodine value of oil sample.
10) Detection and estimation of rancidity of oil sample by Kreis test and TBA number.
11) Determination of consistency of fruit pulp, using Brooke field Synchrolectric Viscometer

REFERENCE BOOKS

1. Food Analysis Theory & Practice by Pomeranz and meloan
2. Chemical Analysis of Food by David Pearson
3. Analysis of Fruit & Vegetable Products by Dr. S. Ranganna / Handbook of Analysis and Quality Control of Fruit and Vegetable products by Dr. S. Ranganna.
4. Quality Control for the Food Industry Vol I & II by Kramer & Twigg.
5. The Chemical Analysis of Foods & Food Products by Jacobs.