



16FT307 INSTRUMENTAL METHODS OF FOOD ANALYSIS

Hours Per Week :

L	T	P	C
3	-	2	4

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
45	-	30	15	45	-	-	10	5

Course Description and Objectives:

The course deals with different instrumental techniques in food analysis. The objective of the course is to impart knowledge to students on principles and techniques of food analysis by using physical, chemical, biological methods and to apply their knowledge and skills acquired to solve real-world problems associated with food analysis.

Course Outcomes:

The student will be able to:

- understand the concepts of techniques in food analysis.
- identify and determine errors and uncertainty of analytical results.
- understand issues in public health protection related to chemical analysis.
- understand proximate analysis of foods.

SKILLS:

- ✓ *Proficiency on analytical methods of food analysis.*
- ✓ *Suggest relevant test methods for a particular food component.*
- ✓ *Perform qualitative and quantitative estimation of compounds present in food.*
- ✓ *Propose equipment limitations, costs, advantages and disadvantages for analysis of foods.*
- ✓ *Interpret the results from sophisticated instrument (HPLC, GC-MS) techniques.*

UNIT - 1**L-9**

SAMPLING AND ITS TECHNIQUES: Introduction - Definitions of Population, Laboratory Sample, Sample, precision, Accuracy, Sensitivity, Reproducibility of analysis, Basic principles of spectrophotometer and colorimeter and its application.

UNIT - 2**L-9**

CARBOHYDRATE ANALYSIS: Introduction, Importance of carbohydrate analysis, Methods of analysis, Sample preparation, Extraction of monosaccharide, Oligosaccharides, Chemical methods for carbohydrates - Gravimetric methods, Titrimetric methods, Colorimetric methods: Phenol sulphuric acid, Enzymatic methods, Physical methods: Polarimetric method, Density, Infrared radiation, Immuno assays, Analysis of starch and crude fiber.

UNIT - 3**L-9**

PROTEIN ANALYSIS: Protein concentration by Kjeldhal method, Enhanced Dumas method using U. V. Visible spectroscopy, Direct measurement at 280 nm, Biuret method, Lowry method, Dye binding method, Turbido metric method.

UNIT - 4**L-9**

LIPID ANALYSIS: Basic principles of chromatography, Types of chromatography and its applications, Analysis of lipids: Introduction, Importance of analysis of lipids, Solvent extraction, Non-solvent extraction methods, Instrumentation methods, Determination of lipid composition: Separation and analysis by chromatography, Lipids fractions of TLC.

UNIT - 5**L-9**

CHEMICAL TECHNIQUES: Analysis of minerals: Introduction, Importance of mineral analysis, Dry ashing, Wet ashing, Low plasma ashing, Adsorption spectroscopy.

LABORATORY EXPERIMENTS**LIST OF EXPERIMENTS**

Total hours: 30

1. Estimation of carbohydrates by Anthrone Reagent method
2. Estimation of starch
3. Estimation of crude fibre
4. Determination of Calorific value of food by Bomb Calorie Meter
5. Determination of Vitamin C by titration method
6. Determination of pigment
7. Estimation of Protein content by Lowry Methods
8. Test for adulterants in Sugar, Jaggery, Honey, Milk, Ghee, plantation crops (Tea, coffee), Turmeric, spices(Cardamom, cloves, pepper)
9. Estimation of Cholesterol

TEXT BOOKS:

1. M. Kalia, "Food Analysis and Quality Control", 1st edition. Kalyani Publishers, New Delhi,

ACTIVITIES:

- *Sample preparation procedure to find mineral composition in finger millet.*
- *HPLC, GC data interpretation.*
- *Significance test for given experimental data.*
- *DSC, TGA data interpretation.*

Hyderabad, 2002.

2. S. S. Nielsen, "Food Analysis", 3rd edition, Aspen Publishers, Gaithery Berg, Mary Land, 1998.

REFERENCE BOOKS:

1. AOAC International, "Official methods of Analysis", AOAC International, 18th edition, Gaithersburg, Mary Land, 2007.
2. Y. Pomeranz and C.E. Meloan, "Food Analysis: Theory and practice", 3rd edition, A.V.I Publishing Company, INC West Port, U.S.A, 2013.
3. J. Jayaraman, "Laboratory Manual in Biochemistry", 3rd edition, Wiley Eastern Publishers, New Delhi, 1980.
4. D. T. Plummer, "An introduction to Practical Biochemistry", 2nd edition, Tata Mc Graw-Hill Publishing Co., New Delhi, 1979.
5. S. Sadasivam and A. Manickam, "Biochemical methods for Agricultural Sciences", 2nd edition, New Age International Publisher, New Delhi, 1996.