



FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: Bachelor of Technology (Food Processing Technology)

Semester: VI

Course Code: 202070604

Course Title: Food Analytical Techniques

Course Group: Professional Elective Course I

Course Objectives: The subject is designed to build the scientific food analysis approach among students. The course provides clear understanding of principles and working operations of various instruments that are commonly used in food industry and food research labs to characterize the structure physical and chemical properties of food components. Exposure to sophisticated instruments will enhance the food analytical skill.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Theory		J/V/P*		Total
				Internal	External	Internal	External	
3	0	2	4	50/18	50/17	25/9	25/9	150/53

* J: Jury; V: Viva; P: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	Introduction to Food Analysis: Selection of analysis methods and samples, Steps in analysis, Method validity, Introduction to AOAC, AACC, AOCS, Codex Alimentarius Commission, National Standards Authority	06
2	Sampling and Sample Preparation: Selection of sampling procedures, Problems in Sampling, Sample preparation	04
3	Compositional analysis of food Moisture analytical techniques: Oven drying, Vacuum oven, Distillation, Karl Fischer Method, Dielectric Method; Ash Analysis – Dry Ashing, Wet Ashing, Microwave ashing; Fat Analysis – Continuous and Batch Solvent Extraction, Gerber Method for milk fat; Protein Analysis – Kjeldahl Method, Dumas Method, Infrared Spectroscopy, Biuret Method, Lowry Method; Carbohydrate Analysis: Phenol Sulphuric acid method, Somogyi-Nelson Method	12
4	Principle and Working of Instruments: pH meter, Electrophoresis unit, Atomic Absorption Spectroscopy, Nuclear Magnetic Resonance Spectroscopy	12



5	Chromatography Techniques and applications in food industry: Introduction to Chromatography, Paper Chromatography, Thin layer chromatography, Gas Chromatography, High Performance Liquid Chromatography	11
	Total	45

List of Practicals / Tutorials:

1	Determination of moisture in a food product by hot air oven drying, vacuum oven drying and infrared moisture analyser and comparing the results.
2	Determination of ash and acid insoluble ash in cereal flour
3	Demonstration of Karl Fischer Instrument
4	Study of principle, components and working of pH meter
5	Study of principle, components and working of spectrophotometer
6	Demonstration of protein characterization by electrophoresis unit
7	Determination of colour of food sample by colorimeter.
8	Determination of water activity of food sample by water activity meter
9	Isolation of casein from milk
10	Qualitative tests for carbohydrates

Reference Books:

1	Food Analysis by S. Suzanne Nielsen 4th Edition. Springer New York
2	Introduction to Instrumental Analysis. By R. P. Braun. Pharma Med Press A Unit of BSP Books Pvt. Ltd. Hyderabad
3	Principles of Instrumental Analysis 7th Edition by Douglas A. Skoog, F. James Holler, Stanley R. Crouch. Cengage Learning
4	Techniques of Food Analysis by Winton A.L. & Winton K.B. Agrobios Publications
5	Spectroscopic techniques for food analysis. Wilson, R.H. (Ed) New York: VCH Publishers.

Supplementary learning Material:

1	http://fssai.gov.in/manuals
2	http://fao.org/fao-who-codexalimentarius
3	http://www.who.int/foodsafety
4	https://nptel.ac.in/courses/103108100
5	https://nptel.ac.in/courses/104108078

Pedagogy:

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Industrial/ Field visits
- Course Projects

Internal Evaluation:

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model



making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc. where individual component weightage should not exceed 20%.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						R: Remembering; U: Understanding; A: Applying; N: Analyzing; E: Evaluating; C: Creating
R	U	A	N	E	C	
20%	40%	10%	10%	20%	0%	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	To know major analytical organization working for analytical methods development & harmonization and Understand the scientific approach for analytical method selection, sample selection and preparation	15
CO-2	Understand compositional analysis of food for macronutrients and other major components.	30
CO-3	Comprehend principles, working and applications of advanced instruments in food analysis	25
CO-4	Conceptualize different types of chromatography techniques and their applications in food analysis	30

Curriculum Revision:

Version:	2
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	
Next Review on (Month-Year):	June-2025