

# PG Dept. of Chemistry, Vimala College (Autonomous)

Engineering College PO  
Thrissur, Kerala 680 009

## ADD-ON COURSE

2020-21

### PRACTICAL METHODS IN FOOD ANALYSIS

This add-on course is exclusively for chemistry main students. The course has been designed and formulated keeping in mind the current trends in Food Technology.



#### Course Outcomes

1. This course will enhance students' job prospects in the Food Industry.
2. Hand-on practical understanding on adulteration in various food types and the brief knowledge about Food Laws in India give them chances for jobs as Food Inspectors.
3. This Course provides basics of analytical techniques in Food Chemistry and gives them an upper hand in analytical industries.

#### Mode of Evaluation & Fees

Evaluation will be on the basis of **Semester Examination**. On successful completion of the course a **Certificate** will be provided. *Course Fee: Rs 500/-.*

*Add on course for First year B.Sc Chemistry students*

## **PRACTICAL METHODS IN FOOD ANALYSIS**

*Duration: 35 hrs*

### **Unit 1: ANALYSIS OF PHYSICO-CHEMICAL PROPERTIES OF FOOD (4hrs)**

*Physico-chemical properties of food- boiling point, evaporation, melting point, smoke point, surface tension, osmosis, humidity, freezing point and specific gravity - Titrable acidity, Non-enzymatic browning, water activity, sulphur dioxide, Benzoic acid and H-ion concentration. Colloidal systems- Particle size and extent of dispersion, stability of colloids, properties of colloidal dispersion. Starch and protein colloids. Type of colloidal system in food- sol, gel, emulsion, foam.*

### **Unit 2: SAMPLING TECHNIQUES AND PROXIMATE ANALYSIS (8hrs)**

*Preparation of samples - dry food sample, moist solid foods. Enzyme inactivation, Storage and preservation- Role of microbes in spoilage of foods and their control- Use of antimicrobial chemicals- organic acids, sugars, sodium chloride, nitrites, phosphates, sulphites, Benzoates, Sorbates / Propionates naturally occurring antimicrobials; Physical methods- Low and high temperatures, drying, radiation and high pressure; Proximate Analysis: Moisture and total solids-different methods, ash, Crude protein, Crude fat, crude fibre, Nitrogen free extract.*

### **Unit 3: PROXIMATE ANALYSIS OF MAJOR COMPONENTS IN FOOD I (6 hrs)**

*Carbohydrates*

*Sugars - reducing and non-reducing sugar, sucrose. Starch- Amylose, water soluble amylose.*

*Fibers - Acid detergent fibre, neutral detergent fibre, Total dietary fibre, pectin*

*Protein - True protein, non-protein Nitrogen, Free amino Nitrogen*

*Fat - Acid value, Fatty acid in fats and oils using GLC, iodine value, Saponification value, Rancidity of fat and oil*

**Unit 4: PROXIMATE ANALYSIS OF MAJOR COMPONENTS IN FOOD II (4hrs)**

*Minerals: Preparation of sample solution, Estimation of Trace elements by AAS (Fe, Cu, Mn, Mg, Zn, K, Na, Ca), Calcium, Phosphorous, Fluorine, Iodine, Lead, Vitamins- Vitamin A, Ascorbic Acid, Thiamine, Riboflavin.*

**Unit 5: FOOD ADDITIVES AND ADULTERATION (5 hrs)**

*Food additives, antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents, bleaching and maturing agent, sweeteners, humectants and anti-caking agents, coloring and flavoring substance*  
*Food adulteration: Types of adulterants- intentional and incidental adulterants, methods of detection. Health hazards and risks.*

**Unit 5: FOOD LAWS AND REGULATION IN INDIA (3 hrs)**

*Laws governing food industry, need for new act, key regulations of FSSA, Requirements and benefits of food grades and standard- BIS, AGMARK, ISI, FPO, CAC*

**Unit 6: PRACTICAL METHODS (5hr)**

*Detection of adulteration in food products-pulses, spices, honey, milk, oil, tea and coffee, sweets - Determination of Saponification value and Iodine value of oil and Fat.*

**REFERENCES:**

1. Srilakshmi B. Food Science 4th edition. New age International
2. Srivastava, R. P. and Kumar, S. 1998, Fruit and vegetable preservation: principles and Practice. 2nd edition. International book distributing co., Lucknow.

3. Mohini Sethi and Eram S Rao. *Food science experiments and applications*. CBS publishers.
4. Raghuramulu, N., Madhavan Nair, K., and Kalyanasundaram, S. Ed. 1983.
5. *A Manual of Laboratory Techniques*. National Institute of Nutrition, ICMR, Hyderabad.
6. Warner, J.M. 1976. *Principles of Dairy Processing*. Wiley Eastern Ltd. New Delhi
7. Jay, J.M. "Modern Food Microbiology". 4th Edition. CBS Publishers, 2003
8. Adams, M.R and M.O. Moss. "Food Microbiology". New Age International, 2002
9. Mann, Jim and Stewart Truswell "Essentials of Human Nutrition". 3rd Edition. Oxford, University Press, 2007.
10. Gibney, Michael J., et al., "Introduction to Human Nutrition". 2nd Edition. Blackwell, 2009.
11. Gropper, Sareen S. and Jack L. Smith "Advanced Nutrition and Human Metabolism". 5th Edition. Wadsworth Publishing, 2008.