

FST 306 Food Analysis and Instrumentation (3 Units)

Application of modern instrumental methods of analysis to the examination food products; atomic absorption spectrometer (AAS); high pressure liquid chromatography (HPLC); gas chromatography (GC); gas chromatography Mass spectrometer (GC/MS); infrared spectrometer (IR); Nuclear Magnetic Resonance Spectroscopy (NMR); preparation gas chromatography (PGC); NEAR infrared reflectance Spectroscopy. UV/visible spectrophotometry, Atomic Absorption spectrophotometry, flame photometry chromatographic techniques in Food Analysis (Paper chromatography, Thin layer chromatography, Gas-Liquid chromatography, HPLC), Electrophoretic techniques, ultracentrifugation techniques in protein analysis and other macronutrients, Enzymatic analysis of food components (sugar, alcohol citric acid etc). Theory and applications in the food industry; hands on demonstrations in the laboratory. Use of radioactive isotopes and bio-assays. Sampling and treatment of food samples for proximate analysis. Principles of analytical methods such as photometry, colorimetry, gravimetry, refractometry and chromatographic methods for food analysis. Principles of physical and chemical analytical methods of water and other major components of foods. Theoretical determination of vitamins in foods Vit C, Vit. B., B2. Use of HPLC for determination of vitamins. Determination of toxic constituents in foods, HCN, Phytic acid, Non protein Nitrogen etc. Sugar analysis, starch, Amylose and amylopectin in foods, damaged starch.

Practical: Determination of vitamins using HPLC. Protein analysis — Total Volatile Nitrogen in meat and fish. Fat analysis — FFA, TBA, Acidity, peroxide value. Dirts in oil, saponification value, unsaponifiable matter. Carbohydrate analysis — Sugar determination using Lane and Eynon method. Starch determination — using phenol- sulphuric acid method. Determination of Beta Carotene and lycopene. Nutritionally important metals — iron in flour, heavy metals — Hg P, Na & K using flame photometer. Determination of pesticides/insecticide residue in foods e.g. organ chlorine DDT. Aflatoxin in foods (groundnut).