SS803 INSTRUMENTAL METHODS OF ANALYSIS 3-1-0-4

Errors in chemical analysis: Evaluation of analytical data, significant figures, types of errors, minimization of errors, standard deviation, coefficient of variation, statistical treatment of data, students T test, Rejection of suspected value, Q test, sampling, standardization and calibration.
Chromatographic Techniques: Basic principles – column resolution and efficiency – gas chromatographic column. Gas liquid chromatography – instrumentation and application. CHN analysis by Gas. HPLC adsorption. Ion exchange and size exclusion chromatography, planar chromatography – application to detection and isolation of compounds.
Diffraction Techniques: X-Ray diffraction techniques – X-Ray generation and properties – lattice planes – Bragg's law – power and thin film diffraction – X-Ray scattering – X-Ray stress measurement –instrumentation and application. Electron diffraction
Thermal gravimetric analysis – instrumentation and operation. Thermal stability assessment and compositional analysis – application to specific samples. Differential scanning thermal analysis – instrumentation and application.
SEM, AFM, STM, STEM, TEM, confocal microscopy – principle, instrumentation, working, applications to characterizing Nanophase materials.

TEXT BOOKS/REFERENCES:

1. D. A. Skoog and D. M. West, "*Principles of Instrumental Analysis*", Eighth Edition. Thomsons-Brooks/Cole, 2004.
2. F. W. Fifield and D. Kealey, "*Principle and Practice of Analytical Chemistry*", Second Edition, International Book Company, 1993.
3. David Harvey, "*Modern Analytical Chemistry*", McGraw Hill Companies, 2000.