

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY
BIOMEDICAL TECHNOLOGY WING, POOJAPURA, TRIVANDRUM – 12
(An Institution of National Importance, Department of Science and Technology, Govt. of India)

VACANCY-ORIENTED PROMOTION SCHEME

Syllabus for the Post of Scientific Assistant (Instruments)

Central Analytical Facility, BMT Wing

General awareness on material characterization and quality management system: Basic understanding on the principles of analysis of materials/devices under the quality management system, concept of quality and quality management systems, accreditation, ISO 17025, accuracy, precision, uncertainty of measurement, uncertainty evaluation methods, ensuring the validity of test results, interlaboratory comparisons and proficiency testing, error evaluation and mitigation, laboratory safety, good laboratory practices.

Spectroscopic characterization of materials: Theory and applications of various spectroscopic techniques. UV Visible spectroscopic analyses, reflectance and colour measurements, FTIR spectroscopic analyses, Raman spectroscopy and Raman chemical mapping, emission analysis, X-Ray spectroscopic techniques for biomedical evaluations, RoHS compliance testing, Role of spectroscopy in the extractables & leachables analysis of medical devices.

Chromatographic techniques for material analysis: Theory and applications of various chromatographic techniques, HPLC analysis, GPC analysis, Gas chromatography, LCMS analysis, Role of chromatography techniques in medical device evaluations, analysis of extractables and leachables.

Mechanical testing of materials and devices: Theory and operations of mechanical test systems such as Universal testing machines, Dynamic mechanical analyzer and Texture analyzer. ISO/ASTM/BIS standards for mechanical testing; modes of testing such as tension, compression and flexural; tests such as tear strength, puncture resistance, peeling force, muco and bio-adhesion analysis; and mechanical evaluation of small medical devices.

Thermal analyses of materials: Theory and applications of various thermal analytical techniques. Thermogravimetric analysis, Differential thermal analysis, Differential Scanning Calorimetry, ASTM methods, Standard and reference materials, modulated measurements, heat capacity, thermodynamic property estimation, Tacticity and crystallinity.

Other physicochemical techniques for analysis: Surface and interfacial tension, viscosity and viscoelastic properties, Rheological analysis, water vapour permeability, and extraction methods.

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