

(BM-311) - Bio-Instrumentation and Measurements - II

Course Outline:

Theory:

1. **Centrifugation techniques**
2. **Electrochemical methods of analysis**
 1. Electrophoresis
 2. Blood banking and transfusion
 3. Chromatography, Liquid chromatography
 4. Gas chromatography
 5. High performance liquid chromatography
 6. Clinical chemistry analyser
 7. Automated cell counter
3. **Spectroscopy**
 1. Spectrophotometry
 2. Flame photometry
 3. Mass spectrometry
 4. Infrared spectrometry
 5. Nuclear Magnetic Resonance Spectroscopy
4. **Microscopy**
 1. Electron microscopy
 2. Atomic force microscopy
 3. Confocal microscopy

List of Practicals:

1. Demonstration and Troubleshooting of centrifuge
2. Separation of Blood components using Centrifuge
3. Hemoglobin separation using Electrophoresis.
4. Design and Development of Virtual Instruments in Lab View.
5. Introduction to Virtual Instrument Designing in Lab View
6. Building Applications using For loops in Lab View
7. Signal Processing using Lab View
8. Analysis of Cefixime Trihydrate using UV Spectrophotometer.
9. Determination of absorption coefficient using UV-spectrophotometer.
10. Wavelength analysis of different light sources using Atomic Spectrometer.
11. Demonstration and working of High Performance Liquid Chromatography (HPLC)
12. Demonstration and working of Hematology Analyzer.
13. Demonstration and working of Chemistry Analyzer
14. Troubleshooting and repair of Medical Equipment
15. Comprehension of documentation and hospital set-up
16. Open Ended Lab 1

Suggested Teaching Methodology:

- Lecturing
- Written Assignments Report Writing

Suggested Assessment:

Theory (100%)

- Sessional (20%)
- Quiz (12%)

- Assignment (8%)
- Midterm (30%)
- Final Term (50%)

Laboratory (100%)

- Labs
- Open-Ended Labs

Recommended Text and Reference Books:

1. Mary C. Haven (Editor), et al, Laboratory Instrumentation, 4th ed, 1995. ISBN: 978-81-265-2857-8
 2. Cromwell, Bio-Medical Instrumentation & Measures 2. 2nd ed,1980. ISBN: 978-81-203-0653-
 3. John G. Webster (Editor), Medical Instrumentation 2. 2nd ed. 2010. ISBN: 978-0-471-67600-3
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