



ರಾಜೀವ್ ಗಾಂಧಿ ಆರೋಗ್ಯ ವಿಜ್ಞಾನಗಳ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು

RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES, KARNATAKA, BENGALURU  
4<sup>th</sup> T Block, Jayanagar, Bengaluru - 560 041

NO. RGU/AUTH/AC/208/2017-18

Date. 14.12.2017

### **NOTIFICATION**

**Sub:** Amendment to Ordinance relating to M.Pharma (Retaining Modern Pharmaceutical Analytical Techniques curriculum in the I Semester for all M.Pharma Courses as per PCI norms)

**Ref:** 1] PCI as published in Gazette of India dated 21.12.2016  
2] RGUHS Notification No. RGU/AUTH/MPHARM/147/2017-18 dated 10.05.2017  
3] Minutes of the meeting of Academic Council held on 08.12.2017  
4] Orders of the Vice-Chancellor dated 14.12.2017

\* \* \*

In exercise of the powers conferred under section 35 of the RGUHS Act, 1994, the following amendment are effected to the Revised Ordinance relating to Master of Pharmacy course (Semester System) published vide Notification referred at (2) above.

- 1) Page 182 & 183 relating to Modern Pharmaceutical Analytical Techniques shall be substituted as per Annexure to this Notification.
- 2) The subject "Modern Pharmaceutical Analytical Techniques" shall be common subject for all M.Pharma courses during I Semester.
- 3) Common Q.P shall be set for all M.Pharma Courses for the Theory Paper of Modern Pharmaceutical Analytical Techniques.

This Notification shall come into effect immediately.

  
**REGISTRAR**

To  
All the Principals of Pharmacy Colleges conducting M.Pharma Courses

**Copy to :-**

1. The Secretary to Governor, Governor's Secretariat, Raj Bhavan, Bangalore- 560 001
2. The Secretary to Government, Health & Family Welfare Department (Medical Education), Vikasa Soudha, Bangalore
3. The Director, Department of Curriculum Cell, RGUHS
4. PA to Vice-Chancellor/Registrar/Registrar (Evaluation), RGUHS, Bangalore
5. The System Analyst, RGUHS to host the Notification on RGUHS Website
6. Office Copy



**Annexure to Notification No. RGU/AUTH/AC/208/2017-18**  
**dated 14.12.2017**

**M.PHARMACY SYLLABUS**  
**OF**  
**MORDERN PHARMACEUTICAL ANALYTICAL**  
**TECHNIQUES**

**Scope:**

This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.

**Objectives**

After completion of course student is able to know,

- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instruments

**THEORY**

**60 HOURS**

**1. UV-Visible spectroscopy:** Introduction, Theory, Laws, Instrumentation associated with UV-Visible spectroscopy, Choice of solvents and solvent effect and Applications of UV-Visible spectroscopy.

**IR spectroscopy:** Theory, Modes of Molecular vibrations, Sample handling, Instrumentation of Dispersive and Fourier - Transform IR Spectrometer, Factors affecting vibrational frequencies and Applications of IR spectroscopy

**Spectrofluorimetry:** Theory of Fluorescence, Factors affecting fluorescence, Quenchers, Instrumentation and Applications of fluorescence spectrophotometer.

**Flame emission spectroscopy and Atomic absorption spectroscopy:** Principle, Instrumentation, Interferences and Applications.

**11 Hrs**

**2. NMR spectroscopy:** Quantum numbers and their role in NMR, Principle, Instrumentation, Solvent requirement in NMR, Relaxation process, NMR signals in various compounds, Chemical shift, Factors influencing chemical shift, Spin-Spin coupling, Coupling constant, Nuclear magnetic double resonance, Brief outline of principles of FT-NMR and <sup>13</sup>C NMR. Applications of NMR spectroscopy. **11Hrs**

**3. Mass Spectroscopy:** Principle, Theory, Instrumentation of Mass Spectroscopy, Different types of ionization like electron impact, chemical, field, FAB and MALDI, APCI, ESI, APPI Analyzers of Quadrupole and Time of Flight, Mass fragmentation and its rules, Meta stable ions, Isotopic peaks and Applications of Mass spectroscopy . **11Hrs**

**4. Chromatography:** Principle, apparatus, instrumentation, chromatographic parameters, factors affecting resolution and applications of the following: a) Paper chromatography b) Thin Layer chromatography c) Ion exchange chromatography d) Column chromatography e) Gas chromatography f) High Performance Liquid chromatography g) Affinity chromatography **11Hrs**

**5. Electrophoresis:** Principle, Instrumentation, Working conditions, factors affecting separation and applications of the following: a) Paper electrophoresis b) Gel electrophoresis c) Capillary electrophoresis d) Zone electrophoresis e) Moving boundary electrophoresis f) Iso electric focusing

**X ray Crystallography:** Production of X rays, Different X ray methods, Bragg's law, Rotating crystal technique, X ray powder technique, Types of crystals and applications of X-ray diffraction. **11Hrs**

**6. Immunological assays :** RIA (Radio immuno assay), ELISA, Bioluminescence assays.

**5 Hrs**