

# RIMT UNIVERSITY

MANDI GOBINGARH, 147301

COURSE Ph.D PROGRAM YEAR (2017-18)



**Pharmaceutical sciences**

**Scheme and Syllabus**

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**FIRST SEMESTER (COURSE WORK)**

<b>Paper</b>	<b>Subject</b>	<b>Theory</b>	<b>Duration Of Examination</b>	<b>Maximum Marks</b>	<b>Passing Marks</b>
<b>Paper-I</b>	<b>Research Methodology</b>	<b>6 Hr/Wk</b>	<b>3 Hours</b>	<b>100</b>	<b>50</b>
<b>Paper-II</b>	<b>Computer Application</b>	<b>6hr/Wk</b>	<b>3 Hours</b>	<b>100</b>	<b>50</b>
<b>Paper-III</b>	<b>Pharmaceutical Sciences: A) Pharmacognosy or B) Pharmaceutical Analysis</b>	<b>6hr/Wk</b>	<b>3 Hours</b>	<b>100</b>	<b>50</b>

**Note:**

- 1. In paper I, II and III (theory), there shall be 40 marks for internal assessment and 60 marks in main examination.**
- 2. A candidate is declared pass if he/she obtain 50% marks individually in each subject and 50%marks in aggregate.**

**Director**

**RIMT UNIVERSITY**  
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**SYLLABUS: PHARMACOGNOSY**

**TIME: 3 HOURS**

**MARKS: 100**

**INTERNAL: 40**

**EXTERNAL: 60**

**Module -A**

Drug discovery and development from natural products with special emphasis on drugs derived from atropine, morphine, quinine, cocaine, podophyllotoxin and paclitaxel

**Module -B**

Pharmacognostic characteristics, chemical constituents and pharmacological basis of therapeutic uses of the Hepatoprotective plants-*Andrographis paniculata*, *Glycyrrhiza glabra*, *Picrorrhiza kurroa*, *Silybum marianum* and *Swertia chirata*.

Pharmacognostic characteristics, chemical constituents and pharmacological basis of therapeutic uses of the Anti inflammatory plants- *Aesculus hippocastanum*, *Boswellia serrata*, *Commiphora mukul*, *Curcuma longa*, *Pluchea lanceolata* and *Vitex negundo*.

**Module -C**

Pharmacognostic characteristics, chemical constituents and pharmacological basis of therapeutic uses of the Antidiabetic plants- *Allium cepa*, *Azadirachta indica*, *Cyamopsis tetragonolobus*, *Gymnema sylvestris*, *Momordica charantia*, *Pterocarpus marsupium*, *Syzygium cuminii* and *Trigonella foenum graecum*.

**Module -D**

Pharmacognostic characteristics, chemical constituents and pharmacological basis of therapeutic uses of the Plants used in cardiovascular disorders- *Digitalis*, *Coleus forskohli*, *Garcinia cambogia*, *Terminalia arjuna*, *Thevetia nerrifolia*, *Viscum album*, *Veratrum* and *Allium sp*.

**Module -E**

Pharmacognostic characteristics, chemical constituents and pharmacological basis of therapeutic uses of the Antiviral plants- *Echinaceae purpurea*, *Sambucus nigra*, *Saponaria officinalis*, *Rhizophora species* and *Thuja occidentalis*;

Anticancer drugs-*Camptotheca acuminata*, *Catharanthus roseus*, *Podophyllum species* and *Taxus species*

**Module -F**

Pharmacognostic characteristics, chemical constituents and pharmacological basis of therapeutic uses of the Plants used as adaptogens and immunomodulators-*Allium sativum* *Asparagus racemosus*, *Ganoderma species*, *Ocimum sanctum*, *Panax ginseng*, *Phyllanthus emblica*, *Tinospora cordifolia* and *Withania somnifera*.

**Reading Material Recommended**

1. W.C. Evans, Trease and Evans Pharmacognosy, 15th edition, W.B. Saunders &Co., London, 2002.
2. S.S. Handa and M.L. Kaul, Supplement to cultivation and utilization of medicinal plants, R.R.L Jammu, India, 1996.
3. Ram P Rastogi, Compendium of Indian Medicinal Plants Vol. I-V, CSIR, Lucknow & NISCOM, New Delhi, 1998.
4. T. Fleming, PDR for Herbal Medicine, 2nd edition Medical Economics compant, Mountvale, New Jersy, 2000.
5. M.J. Cupp, Toxicology and Clinical Pharmacology of Herbal Products, Humana Press, New Jersy, 2000

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**SYLLABUS: ANALYTICAL TECHNIQUES**

**TIME: 3 HOURS**

**MARKS: 100**

**INTERNAL: 40**

**EXTERNAL: 60**

**Module -A**

**Basic Techniques**

Buffers; Methods of cell disintegration, Dialysis, Ultrafiltration (principle, method and application)

**Module -B**

**Spectroscopy Techniques**

Theory and Principle of UV and Visible, Circular Dichroism; Fluorescence; MS (MS-MS, MALD-TOF), NMR spectroscopy.

**Module -C**

**Chromatography Techniques**

Theory, Principle and application of TLC, Paper chromatography, Gel permeation, Ion exchange and Affinity chromatography; HPLC and GLC

**Module -D**

**Electrophoresis techniques**

Theory and application of Polyacrylamide and Agarose gel electrophoresis, 2DElectrophoresis; Gradient electrophoresis; Pulsed field gel electrophoresis

**Module -E**

**Centrifugation**

Basic principles; Mathematics & theory (RCF, Sedimentation coefficient etc); Types of centrifuge - Microcentrifuge, High speed & Ultracentrifuges; Preparative centrifugation; Differential & density gradient centrifugation, Applications (Isolation of cell components)

**Module -F**

**Other basic techniques**

Theory, Principle & application of Flow Cytometry, ELISA, Southern, Northern Blotting, western blotting, RFLP, RAPD, AFLP, DNA sequencing, New GEN sequencing, Microarray.

**Suggested Readings**

1. Thomas G.M. Schalkhammer. Methods & Tools in Biotechnology, Analytical Biotechnology, Bertelsmann Springer Publishing Group
2. Donald L. Pavia, Gary M. Lampman, Introduction to Spectroscopy IV Edition, Brooks/Cole Cengage Learning
3. Frank C. Hay, Olwyn M.R. Westwood, Practical Immunology, Fourth Edition, Blackwell Science
4. Jack G. Chirikjian, Biotechnology: theory and techniques, Vol 1-5, 1995, Jones and Bartlett Publishers

5. Freifelder D., *Physical Biochemistry, Application to Biochemistry and Molecular Biology*, 2nd Edition, W.H. Freeman & Company, San Fransisco, 1982.
6. Keith Wilson and John Walker, *Principles and Techniques of Practical Biochemistry*, 5th Edition, Cambridge.