Minutes of Board of Studies Meeting

Board of Studies meeting was held on 21.04.2013, 10:00 a.m. at Department of Pharmacy, M. J. P. Rohilkhand University, Bareilly, to initiate start of M. Pharm course in specialization viz Pharmaceutics and Pharmacology with intake of 18 seats in each branch after grant of permission from All India Council for Technical Education vide letter no. F.No.Northern/1-490318252/2013/EOA dated 19.03.2013. The syllabus and ordinance of M. Pharm (Pharmaceutics), M.Pharm (Pharmacology) were formed, discussed and finalized following members attended the meeting.

1.	Shri S. D. Singh	Convenor
2.	Dr. Vijay Jyoti Kumar	External Expert Member
3.	Dr. Sobhna Singh	Member
4.	Dr. Kamal Kishore	Member
5.	Dr. S. B. Tiwari	Member
6.	Mr. Amit Verma	Member
7.	Mr. Lakshyaveer Singh	Member
8.	Mr. Kaushal Kumar	Member
9.	Dr. Saurabh Mishar	Member

The external member Dr. Pawan Krishan Could not come due to unavoidable circumstances.

Following recommendations were made;

a) M. Pharm programme should be started from academic session 2013-14 with intake of 18 seats in each branch viz Pharmaceutics and Pharmacology.
b) The ordinances, syllabus, teaching and evaluation scheme was finalized by the committee constituted for same.
c) These courses should run strictly as per norms laid by statutory bodies (AICTE) in terms and norms of University. The convenor ended the meeting with vote of thanks.

(Shari S. D. Singh)

(Dr. Vijay Jyoti Kumar)

(Dr. Kamal Kishore)

(Dr. Sobhna Singh)

(Dr. S. B. Tiwari)

(Mr. Amit Verma)

(Mr. Lakshyaveer Singh)

(Mr. Vimal Kumar)

(Mr. Kaushal Kumar)

(Dr. Saurabh Mishra)

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INSTITUTE OF ENGINEERING & TECHNOLOGY
M.J.P. ROHILKHAND UNIVERSITY, BAREILLY

Ref. No- IET / MJP /.....

Dated 21-04-2013

MINUTES

Sub: Meeting of Faculty Board at 12:30PM on 21-04-2013.

A meeting of Faculty Board was convened at 12:30PM on 21-04-2013. Various approved proposals submitted by different departments were disucussed.The Faculty Board hereby submit the recommendations for further approval by Academic Council and Executive Council. The recommendations made are as following.

1. The minutes of BOS of the Department of Pharmacy (held on 21-04-2013) pertaining to syllabus & semester systems ordinance of M.Pharm. Pharmaceutics and Pharmacology (which have already been approved by AICTE) were discussed and approved as such by the Faculty Board.
2. Minutes of BOS meeting of the Department of Applied Chemistry which was held on 30-08-2012 were discussed and approved.
3. The semester system ordinances of M.Sc course in Applied Chemistry, Applied Mathematics and Applied Physics under the IET were discussed and approved.
4. The Minute of BOS meeting of the Department of Maths (held on ~~19-09-2012~~ 06.08.2012) were discussed and approved.
5. The minutes of BOS meeting of the Department Physics (held on 19-09-2012) were discussed and approved.
6. Minutes of the meeting of all Departmental Coordinators of Training and Placement Centre from all Departments of Faculty of Engineering & Technology which was held at the office of Training & Placement Officer, M.J.P.R. University on 20-4-2013 at 12:00 noon were discussed and approved as such.
7. Syllabus of B.Tech was revised by the department of EI and implemented without the approvals of Faculty Board, Academic Council & Executive Council. Regarding the above issue a letter was sent to the Registrar. The Registrar replied with the information that Hon'ble Vice-Chancellor has the view that syllabus can only be implemented only after the approvals by AC

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& EC. All the members of the Faculty Board were of the opinion that matter may be discussed in the meeting of Academic council for final decision.

8. Minutes of BOS meeting of the Department of CSIT which was held on 19-04-2013 were discussed and approved.
9. As per recommendations of the UGC with reference to directive of the Task force on National Security, it is decided that the subject "cyber security/ information security" should be introduced as an elective subject for UG & PG courses.

(S.K.Chaurasia)
HOD ME

(Dr Sudhir Kumar)
HOD Physics

(Sanjay Singh)
HOD EE

(S.D. Singh)
HOD Pharm

(Dr. Saleem Khan)
Member

(Dr. S.K. Pandey)
HOD Chesmistry

(Dr Ravendra Singh)
HOD CSIT

(Dr S. K. Tomar)
HOD EC

(Dr Vijay Jyoti Kumar)
External Expert

(Dr.K.K. Maheshwari)
Member

(M.S. Karuna)
HOD Chemical

(Dr. A. K. Gupta)
Dean IET

(Dr. A Prasad)
HOD Mathematics

M. J. P. ROHILKHAND UNIVERSITY
BAREILLY
DEARTMENT OF PHARMACY

Syllabus
Master of Pharmacy (M.Pharm)
(Pharmaceutics)
Effective from academic session 2013-14

Subject and evaluation scheme, M. Pharm (Pharmaceutics)

Name of Subject	Marks Allotted				
M. Pharm. Ist Year, Ist Semester	**Paper**	**(H/W)**	**Internal**	**External**	**Total**
Modern Analytical Techniques	1	4	30	70	100
Modern Analytical Techniques Practical	2	6	30	70	100
Pharmaceutical Biotechnology	3	4	30	70	100
Product Design & Development	4	4	30	70	100
Product Design & Development Practical	5	6	30	70	100
M. Pharm Ist Year, IInd Semester					
Biopharmaceutics & Pharmacokinetics	6	4	30	70	100
Biopharmaceutics & Pharmacokinetics Practical	7	4	30	70	100
Novel Drug Delivery System	8	6	30	70	100
Novel/Advanced Drug Delivery System Practical	9	4	30	70	100
Advanced Drug Delivery	10	6	30	70	100
M. Pharm IInd Year, IIIrd Semester					
Research Methodology	11	4	20	30	50
Workshop on Research Methodology	12	---	20	30	50
Synopsis Presentation & Viva Voce	13	---	--	100	100
M. Pharm IInd Year, IVth Semester					
Dissertation Work_presentation+viva voce	14	---	---	300	300

Semester-I
(Pharmaceutics)
Paper 1-MODERN ANALYTICAL TECHNIQUES

External Marks: 70 4 hours/week
Internal Marks: 30
Total Marks: 100

1- Theory, instrumentation and applications with regard to drug analysis, decomposition product indentification and estimation, metabolite analysis and special methods based on: Ultraviolet-visible spectrophotometry, Infrared spectrophotometry and Fluorimetry.

2- Theory, instrumentation and basic principles and recent advances of:

1. 1H Nuclear Magnetic Resonance Spectroscopy (1H NRM): Concepts of chemical shift, spin-spin coupling, coupling constant, shielding and deshielding effects.
2. Mass Spectroscopy: Introduction, different techniques of ionization (CI, EI & FABMS) isotopic abundance, molecular on fragmentation, base peaks etc, Nitrogen rule.
3. Chromatographic methods, principles and applications of: Gas-chromatography including GC-MS; High performance liquid chromatography; Electrophoresis (gel and capillary) with an emphasis on specific examples of biological assay methods by HPTLC.

Books Recommended:

1. Willard H.H., Merrit L.L., Dean J.A., Settle P.A., Instrumental Methods of Analysis, Van Nostrand.
2. Skoog D.A., Heller F.J., Nieman T.A., Principles of Instrumental Analysis, WB Saunders.
3. Hunson J.W., ed. Pharmaceutical Analysis, Modern Methods, part A & B, Marcel Dekker.
4. Schirmer R.E., ed. Modern Methods of Pharmaceutical Analysis, Vols 1, 2. Boca Raton F.L., CRC Press.
5. Mann C.K. et al., Instrumental Analysis Harper & Row.
6. Jaffe H.H., Orchin M., Theory & Applications of Ultraviolet Spectroscopy, Willy.
7. Silverstein, Spectrometric identification of Organic Compounds, Willy.
8. Bovey F., Jelinski L., Miran P., Nuclear Magnetic Resonance Spectroscopy, Sau: Diego Academic.
9. Stothers J.B., Carbon-13 NMR.Spectroscopy, Academic.
10. Gordy W., Theory & Applications of Electron Spin Resonance, Willy.
11. Haswell S.J., ed. Atomic Absorption Spectroscopy, Elsevier.
12. Ardrey R.E., Pharmaceutical Mass Spectra, Pharmaceutical Press, London.
13. Budzikiewicz et al., Interpretation of Mass Spectra of Organic Compounds, Holden-Day San Francisco.
14. Beckett and Stenlake, Practical Pharmaceutical Chemistry, CBS.
15. Stahl E., Thin Layer Chromatography- A laboratory Handbook, Springer-Verlag
16. Giddings J.C., Principles and Theory- Dynamics of Chromatography, Marcel Dekker.
17. Sethi P.D., Quantitative Analysis of Pharmaceutical formulations, CBS Publishers, New Delhi.
18. Kemp William, Organic spectroscopy, Pal grave, New York.
19. Kalsi P.S., Spectroscopy of organic compounds, New age publishers, New Delhi.
20. Gross - Mass Spectrometry
21. WHO - Quality Assurance of Pharmaceuticals, Vol. I, II.
22. Sethi P.D., HPLC, Quantitative Analysis of Pharmaceutical Formulations, CBS Publishers, Delhi.
23. Sethi P.D., HPTLC, Quantitative Analysis of Pharmaceutical Formulations, CBS Publishers, Delhi.
24. Haffmann, Chromatography.
25. Sethi and Charcgankar, Identification of Drugs in Pharmaceutical Formulations by TLC.
26. Robert D. Braun, Introduction to Instrumental Analysis.
27. Wilfried M.A. Niessen- Liquid Chromatography-Mass Spectrometry.

28. Harry G. Brittain, Spectroscopy of Pharmaceutical Solids.
29. George S., Steroid Analysis in Pharmaceutical Industry.
30. Higuchi, Pharmaceutical Analysis.
31. Bidingmeyer, Practical HPLC Methodology and Applications.
32. Hoffmann, Mass Spectrometry: Principle and Application.
33. Scott, Techniques and Practice of Chromatography.
34. Wilkins, Identification of Microorganism by Mass Spectrometry.
35. Wu, Handbook for Size Exclusion Chromatography and related Techniques.

Paper 2-PRACTICALS OF MODERN ANALYTICAL TECHNIQUES

External Marks: 70 6 hours/week
Internal Marks: 30
Total Marks: 100

Practical Based on theory

Paper 3-PHARMACEUTICAL BIOTECHNOLOGY

External Marks: 70 4 hours/week
Internal Marks: 30
Total Marks: 100

1. Status and Scope of Biotechnology in Pharmacy Enzyme immobilization-Principles and Prhamaceutical applications.
2. Biotechnology based pharmaceutical using recombinant DNA Technology, interferons and reverse transcriptase.
3.Optimization of fermentation processes- Ethyl Alcohol, Antibiotics, Vitamins, Amino acids and Pharmaceutical solvents- raw materials, process and process Validation.
4. Bo-technology & GMP Formulation approaches to protein stabilization. Regulatory aspects of Biotechnology based pharmaceuticals.
5. Introduction to Bioinformatics.

Book Recommended:

1. Wiseman A.,ed, Principles of Bio-technology", Chapman & Hall.
2. Antebi E, Fishlock D., " Biotechnology- Strategies for life", Cambridge.
3. Higgins 1.1., Best, DJ & Jones " Biotechnology, Principles & Applications" Blackwell Scientific Publications, Oxford.
4. Stanbary P.F. and Whitaker, A " Principles of Fermentation Technology" Pergamon Press, Oxford.
5. Golub E " The limits of Medicine: How Science shapes our Hope for the cure " Time Books, New York.
6. Bickerstaff GF. " Enzymes in Industry and Medicine,New Studies in Biology" Edwin Arnold, London.
7. Glick. BR, Pasternak J.I., "Molecular Biotechnology-Principles and Applications of Recombinant DNA" ASM Press Washington.

Paper 4-PRODUCT DESIGN AND DEVELOPMENT

External Marks: 70 4 hours/week
Internal Marks: 30
Total Marks: 100

1. Fundamental Aspects of Product Development: Studies of wettability, solubility, dissolution, partition and other physico chemical properties of drug affecting dosage form development. Preformulation studies. Pediatric and geriatric aspects of formulation.
2. Designing of oral pharmaceuticals: Formulation, evaluation of oral solid and liquid dosage forms with recent advances.
3. Development of parenterals: Concepts, formulation, evaluation of large volume and small volume parenterals. Quality Assuarance in manufacturing.
4. Ophthalmic Preparations: Formulation consideration, evaluation, packaging of ophthalmic products (solution, suspensions, ointment, contact lenses)
5. Dermatological Preparations: Formulation, evaluation of ointments, creams, gels herbal creams
6. Stability Studies: Theoretical considerations, stability indicating assays, influence of packaging component on stability of dosage forms
7. Concept of total quality management, requirements of GMP, GLP, GCP, Regulatory requirements of drugs and Pharmaceutical (USFD-NDA/ ANDA)
8. Documentation and Maintenance of records.
9. Intellectual property rights patents, Trademarks, Copyrights, Patents Act.

Books Recommended:

1. Bannker GS & Rhodes C.T., ' Modern Pharmaceutics', Marcel Dekker, New York.
2. Liberman H.A. et al, 'Pharmaceutical Dosage Forms-Tablets.' Marcel Dekker, New York.
3. Gennaro A.R.,Remington, 'The Science & Practice of Pharmacy.' Lippincott. William & Wilkins.
4. Lachman L, Lieberman H.A. & Kanig J.L. 'The Theory & Practice of Industrial Pharmacy.' Varghese Publishing Home.
5. Aulton M.E., ' Pharmaceutics-The Science of Dosage form Design ' Churnchill Livingstone.
6. Osborne D.W. & Amann A.H. ,'Topical Drug Deliverry Formulation ' Marcel Dekker, New York.
7. Bontempo J.A.,' development of Bio-Pharmaceutical Parenteral Dosage Forms' Marcel Dekker, Nerw York.
8. Liberman H.A. et al , 'Pharmaceutical Dosage Forms-Parenterals, Marcel Dekker, New York.
9. Carstensen J.T., 'Drug Stability-Priciples & Practice ' Marcel Dekker, New York.
10. Malmsten M. , ' surfactants and Polymers in Drug Delivery' Marcel Dekker ,New York.
11. Dressman J.B. & Lennernas H. ,' oral Drug Absorption: Prediction and Assessment' Marcel Dekker, New York.
12. Gordon A.et al, 'Transport Process in Pharmaceutical Systems' Marcel Dekker, New York.
13. Brittain .H.G. 'Polymorphism in Pharmaceutical Solids' Marcel Dekker, New York.
14. Parikh D.M.' Handbook of Pharmaceutical Granulation Technology' Marcel Dekker, New York.
15. Alderborn G.& Nystrom C ' Pharmaceutical Powder Compactiopn Technology' Marcel Dekker, New York.
16. Welling P.G. et al ,' Pharmaceutical Bioequivalence' Marcel Dekker, New York.
17. Weiner M.L., & Kotkoskie L.A., 'Excipient Toxicity & Safety' Marcel Dekker, New York.
18. Ansel H.A.- Pharmaceutical Dosage Forms.
19. Sarfaraz K.Niazi, Handbook of Preformulations: Chemical, Biological and Botanical Drugs.
20. Willing, S.W., & Stoker, Good Manufacturing Practices for Pharmaceuticals, Marcel Dekker, New York.
21. Guarino, R.A., New Drug Approval Process, Marcel Dekker, New York.
22. Drug & Cosmetic Act.
23. Patents Act.

24. Federal Food, Drug & Cosmetic Act.
25. Bansol, IPR Guidelines for Pharm students and Researchers.
26. Pisano-FDA Regulatory Affairs.
27. Phillip W. Grubb, Patents for Chemicals, Pharmaceuticals and Biotechnology.
28. Aulton M.E. 'Pharmaceutics – The Science of Dosage form Design' Churncill Livingstone.
29. Levin M.A.' Pharmaceutical process Scale up ' Marcel Dekker, New York.
30. DeSpautz.J.F.'Automation and Validation of information in Pharmaceutical Processing' Marcel Dekker, New York.
31. Kennedy T. 'Pharmaceutical Project Management' Marcel Dekker, New York.

Paper 5-PRACTICALS OF PRODUCT DESIGN AND DEVELOPMENT

External Marks: 70 6 hours/week
Internal Marks: 30
Total Marks: 100

Practicals based on theory

Semester-II
(Pharmaceutics)

Paper 6-BIOPHARMACEUTICS AND PHARMACOKINETICS

External Marks: 70 4 hours/week
Internal Marks: 30
Total Marks: 100

1. Drug Absorption Distribution & Disposition.
2. Pharmacokinetics. Open, one compartment, two compartment & three compartment models & their limitations, applied to intra venous injection as route of admistration.
3. Non-compartmental pharmacokinetics. Graphical methods of calculating pharmacokinetic parameters.
4. Continuous input kinetics: Accumulation, Disposition following I.V. infusion, infusion plus I.V. injection.
5. Factors influencing bio-availability, evaluation ofbioavailability, bio-equivalence with reference to BCS.
6. Dosage Regimens, Repetitive dosing and dose adjustments in renal and hepatic failure, individualization of dosage regimen. Pharmacokinetic applications in Clinical practice.

Paper 7-PRACTICALS OF BIOPHARMACEUTICS AND PHARMACOKINETICS

External Marks: 70 6 hours/week
Internal Marks: 30
Total Marks: 100

Practicals based on theory

Paper 8-NOVEL DRUG DELIVERY SYSTEMS

External Marks: 70 6 hours/week
Internal Marks: 30
Total Marks: 100

1. Polymers and their applications in development of NDDS: Introduction, basic properties of biodegradable polymers and non biodegradable polymers, their uses
2. Nutraceuticals: Introduction and scope
3. Target oriented drug delivery systems: Principle and method of targeting. Preparation and evaluation of carrier systems such as Liposomes, Aquasomes, Niosomes, Nanoparticles, Microspheres, Liquid crystals, Resealed erythrocytes, Monoclonal antibodies, Lipoprotein activate carbons, dendrimers. Recent advances in target drug delivery systems.
4. Newer approaches in intravaginal and intrauterine drug delivery systems: IUD, medicate and copper IUD, hormone releasing IUD
5. Recent advances in fast release formulations: Introduction, Formulation and evaluation

Books Recommended:

1. Chien YW., ' Novel Drug Delivery Systems-Fundamentals, Developmenttal concepts.' Biomedical Assessment , Marcel Dekker, New York.
3. Schreier ,H ,' Drug Targeting Technology Physical, Chemical 7 Biological Methods,' Marcel Dekker, New York.
4. Banker GS & Rhodes C.T. ,'Modern Pharmaceutics', Marcel Dekker, New York.
5. Gennaro A.R., 'Remington, The Science & Practice of Pharmacy,' Lippincott. Williams & Wilkins.
6. Lachman L, Lieberman B.A & Kanig IL.' The Theory & Practice of Industrial Ph 2 Tmacy', Varghese Publishing Home.
7. Aulton M.E.,'Pharmaceutics-The Science of Dosage form Design' Churchill Livingstone.
11. Cohen S & Bernstein H, 'Microparticulate Systems for the Delivery of Proteins and Vaccenes,' Marcel Dekker, New York.
13. Benita S. ' Microencapsulation : Methods and Industrial Application', Marcel Dekker , New York.
14. Kreuter J, 'Colloidat'al Drug Delivery Systems' Marcel Dekker, New York.
15. Rolland A. 'Particulate carriers: therapeutic Applications' , Marcel Dekker, New York.
16. Vyas S. P., Khar R. K., "Targeted & controlled drug delivery novel carrier systems" CBS Publication & Distributors, New Delhi.
17. Jain N. K. "Advances in controlled & novel drug delivery" CBS Publication & Distributors, New Delhi.
18. Jain N. K. " Controlled & novel drug delivery" CBS Publication & Distributors, New Delhi.

Paper 9- PRACTICALS OF NOVEL/ADVANCED DRUG DELIVERY SYSTEM

External Marks: 70 6 hours/week
Internal Marks: 30
Total Marks: 100

Practicals based on theory

Paper 10-ADVANCED DRUG DELIVERY SYSTEM

External Marks: 70 4 hours/week
Internal Marks: 30
Total Marks: 100

1. Formulation considerations with special emphasis on release pattern.
2. Sustained and controlled release dosage forms: Principles involved, advantages, disadvantages, dose considerations, physical, chemical and biological properties relevant to sustained release formulation and there recent advances.
3. Formulaion, evaluation, development of parenteral sustained/controlled release dosage forms

4. Mucosal drug delivery systems: Mechanism of trans mucosal permeation, mucous membrane models, buccal, nasal, pulmonary drug delivery systems: their development and evaluation.
5. Transdermal drug delivery systems: Fundamentals, development and evaluation of TDDS. Iontophoresis and ionophoresis and other modern approches.
6. Oral controlled drug delivery systems:Principles involved, basic concept, osmotic pressure controlled, membrane permeation controlled, pH independent, ion exchange, controlled gel diffusion, controlled and hydrodynamically balanced systems, their evaluation.

Books Recommended:

1. Chien YW., ' Novel Drug Delivery Systems-Fundamentals, Developmenttal concepts.' Biomedical Assessment , Marcel Dekker, New York.
2. Chien YW., ed., 'Transdermal Controlled Systemic Medications ' Marcel Dekker, New York.
4. Banker GS & Rhodes C.T. ,'Modern Pharmaceutics', Marcel Dekker, New York.
5. Gennaro A.R., 'Remington, The Science & Practice of Pharmacy,' Lippincott. Williams & Wilkins.
6. Lachman L, Lieberman B.A & Kanig IL.' The Theory & Practice of Industrial Ph 2 Tmacy', Varghese Publishing Home.
7. Aulton M.E.,'Pharmaceutics-The Science of Dosage form Design' Churchill Livingstone.
8. Mathiowitz, E. et al ' Bioadhesive Drug Delivery Systems: Fundamentals, Novel Approaches, and Development', Marcel Dekker, New York.
9. Bronaugh RL & Maibach H.I. ' Percutaneous Absorption Drugs-Cosmetics-Mechanism-Methodology', Marcel Dekker, New York.
10. Potts R.O. & Guy R.H., ' Mechanism of Trans dermal Drug Delivery', Marcel Dekker, New York.
11. Cohen S & Bernstein H, 'Microparticulate Systems for the Delivery of Proteins and Vaccenes,' Marcel Dekker, New York.
12. Rathbone MJ,' Oral Mucosal Drug Delivery ' Marcel Dekker, New York.
14. Benita S. ' Microencapsulation : Methods and Industrial Application', Marcel Dekker , New York.
15. Jain N. K. "Advances in controlled & novel drug delivery" CBS Publication & Distributors, New Delhi.
16. Jain N. K. " Controlled & novel drug delivery" CBS Publication & Distributors, New Delhi.

Semester-III
(Pharmaceutics)
Paper 11-RESEARCH METHODOLOGY

External Marks: 70 4 hours/week
Internal Marks: 30
Total Marks: 100

1. Research: meaning, purpose, types, objectives of research.
2. Literature survey: use of library, books, journal, medlines, internet
3. Selecting a problem and preparing research proposal
4. Documentation: Research paper/thesis writing (different parts, key words, implementation of statistics discussion, support or non support of hypothesis, practical and theoretical implications.
5. Statistical Analysisof data including standard deviation, standard error, student t-test, chi-square test, confidence level, null hypothesis, analysis of variance(one and two way), factorial design, ANOVA (one way and two way), multiple comprasion procedures
6. Application of software for statistical calculatons like SPSS, foxtron

Book Recommended:

1. Bolton, Pharmaceuticals Statistics- Practical & Clinical Applications, Marcel & Dekker, New York.
2. Fisher, R.A., Statistical Methods for Research Works, Oliver & Boyd, Edinburgh.

3. Chow, Statistical Design and Analysis of Stability Studies, Marcel Dekker, New York.
4. Buncher, Statistics in the Pharmaceutical Industry, Marcel Dekker, New York.
5. Finney, D.J., Statistical Methods in Biological Assays, Hafner, New York.
6. Montgomery, D.C., Introduction to Statistical Quality Control, Willy.
7. Khan, Irfan A., Biostatistics for Pharmacy.
8. Khan, Irfan, A., Fundamentals of Biostatistics.
9. Gauthaman, Biostatistics for Pharmacy students.
10. Lipschutz, Introduction to Probability and Statistics.
11. Liwan Po, Statistics for Pharmacist.
12. William E. Fassett, Computer Application in Pharmacy.
13. Ekins, S., Computer Application in Pharmaceutical Research & Development, Wiley.
14. Nageswara Rao and Tiwari, Biostatistics and Computer Applications.

Paper 12-WORK SHOP ON RESEARCH METHODOLOGY

External Marks: 70
Internal Marks: 30
Total Marks: 100

Workshop on research methodology

Paper 13- SYNOPSIS PRESENTATION & VIVA-VOCE

External Marks: 100
Total Marks: 100

Semester-IV
(Pharmaceutics)

Paper 14- DISSERTATION, PRESENTATION & VIVA-VOCE

External Marks: 300
Total Marks: 300