Bhujbal Knowledge City, MET's Institute of Pharmacy, Adgaon, Nashik

M. Pharm (Pharmaceutics) 2013 Pattern (Sem I)

Advanced Analytical Techniques

Student should be able to

No	Course Outcome
1	Learn the principle, instrumentation and applications of various spectroscopic and chromatographic analytical techniques like UV-VIS spectroscopy, IR spectroscopy, Nuclear Magnetic Spectroscopy, Mass spectrometry, HPLC, GC, UPLC, SCFC, LC-MS and GC-MS
2	Learn the principle, instrumentation and applications of various thermal methods of analysis and electron microscopy
3	Elucidate the structure using UV, IR, NMR and MS spectral data.
4	Study and understand the effect of various solvents on absorption maxima of drugs and to learn the Beer's law limit of drugs in suitable solvent.
5	Learn and understand various multicomponent analysis technique by UV spectrophotometry for estimation of drugs in combined dosage form.
6	Perform assay of drugs official in various pharmacopoeias by UV spectrophotometry, titrimetry and HPLC. To perform validation of assay method as per USP and ICH guidelines.

Dr. S. S. Sonawane
(Subject I/c)

Research Methodology

Student should be able to

No.	Course Outcomes
1.	Understand Meaning and objective of research, types of research and to study preparation of research proposals and different methods of Literature survey.
2.	Study Technical writing like Research report, Research papers, Review papers, thesis writing and to acquire Presentation skills.
3.	Learn Cost analysis of the project, research organizations and procurement of research grants.
4.	Understand basic definitions/concepts of statistics like Variables and variation, sample and population, precision, accuracy and bias along with concept of Experimental design and types.
5.	Understand various parameters of Descriptive Data Analysis like and Inferential data analysis statistical measures, normal distribution, measures of relative position, measures of relationship.
6.	Learn inferential data analysis with reference to Statistical inference, the central limit theorem, parametric tests, testing statistical significance, decision making sample Z test, student's distribution (t), crossover design, variance (ANOVA) , multiple regression and correlation and nonparametric tests.

(1) Dr. S.N. Sure
Sub I/c

(2) Dr. Ahirrao
S.P.

Bhujbal Knowledge City, MET's Institute of Pharmacy, Adgaon, Nashik

M. Pharm (Pharmaceutics) 2013 Pattern (Sem I)

Advanced Pharmaceutics

Student should be able to

No.	Couse Outcomes
1	Understand the preformulation concept used in the development of effective, stable and patient friendly dosage by studying the physicochemical properties using analytical tools as well as to predict the mechanism of drug degradation
2	Learn the applications of natural, synthetic and semi synthetic polymeric material used in the development of dosage forms
3	Overview variety of functional materials used for development of dosage form, and to learn about their potential to interact with drug and packaging materials.
4	Be familiar with the concept of quality control, quality assurance and validation
5	Utilize various statistical techniques for optimization of dosage form.

Dr. M. P. Patil

Sterile Products Formulation & Technology

Student should be able to

No.	Course Outcomes
1.	Learn preformulation, general requirements, formulation principles, packaging materials used, types, choice of containers, official quality control tests and methods of evaluation for sterile products such as SVPs, LVPs.
2.	Describe classification, general requirements, formulation, and evaluation of ophthalmic product along with ocular inserts, particulate and liposome drug delivery, protein and peptide delivery
3.	Explain merits, demerits, and application of fundamental concept of Sustained Release Parenterals
4.	Acquire the knowledge and understand the layouts of parenteral and BFS /FFS is an advanced aseptic processing technology
5.	Know the different Parenteral devices with its applications and understand the number of Hazards associated with Parental Therapy
6.	Adapt the knowledge of Good manufacturing Practices and regulatory guidelines and different process involved in Large-scale sterilization, development and validation

Dr. Thombre NA
(Subject I/C)

Bhujbal Knowledge City, MET's Institute of Pharmacy, Adgaon, Nashik

M. Pharm (Pharmaceutics) 2013 Pattern (Sem II)

Drug regulatory Affaires

Student should be able to

No.	Couse Outcomes
1	Be familiar with Indian regulatory agencies and their modus operandi for the benefit of the society.
2	Provide knowledge of regulations governing the pharmacy profession, activities under the profession and working of different statutory bodies under the regulations.
3	Understand various certification system with special emphasis on quality, safety and efficacy.
4	Know the dug regulatory aspects for drug registration in National and International market
5	Study the different types of intellectual property rights and their benefits for the welfare of individual as well as society at large.
6	Learn American and European patent systems and treaties for intellectual property rights.

Dr. Ahirrao Dr. M. P. Patil

Formulations and Development

Student should be able to

No.	Couse Outcomes
1	Understand the concept of development of solid, liquid, semisolid and aerosol type of dosage form thoroughly including basics, formulation concept, methods of preparation and characterization
2	Incorporate concept of nutraceuticals as a medicine along with its formulation
3	Study in detail the regulatory guidelines viz. QbD and pharmaceutical development used by pharmaceutical industry.
4	Understand the concept of packaging of pharmaceuticals with regulatory perspective along with study of materials used for packaging.
5	Be Familiar with variety of veterinary dosage form used along with techniques used for administrations.

Dr. M. P. Patil

Bhujbal Knowledge City, MET's Institute of Pharmacy, Adgaon, Nashik

M. Pharm (Pharmaceutics) 2013 Pattern (Sem II)

Novel Drug Delivery Systems

Student should be able to

No.	Couse Outcomes
1	Describe impact of drug properties and route of administration on control and Sustained release dosage forms. To describe formulation, fabrication and evaluation of various oral controlled drug delivery systems including gastro retentive, colon targeted and pulsatile drug delivery.
2	Describe injectable controlled release, formulation of long acting contraceptive formulations; implantable drug delivery; micro spheres, liposomes & quality control. To describe buccal, sublingual, rectal, nasal, mucosal & vaginal drug delivery: formulation development, in-vitro, ex-vivo and in-vivo methods of evaluation.
3	Describe permeation through skin including mechanism, permeation enhancers, in-vitro skin permeation, technologies for developing transdermal drug delivery system & evaluation parameters. To describe biopharmaceutical classification of drugs, absorption of permeability and solubility limited drugs. Bio wavers for bioequivalence studies, strategies to enhance bioavailability.
4	Describe composition, preparation, characterisation, stability, pharmacokinetics, clinical applications, production and scale up of Liposomes; structure & classification, methods of preparation, properties, release behaviour, characterisation, pharmacokinetics & in-vivo evaluation, applications and toxicity of Niosomes; structures, theories of formation, formulation consideration.
5	Describe concept of micro particles Nanoparticles Dendrimers. To describe active & passive targeting, resealed erythrocyte, monoclonal antibodies drug targeting particulate carrier system, specific drug delivery to targeted organs like brain & colon, freeze drying of parenteral, environmental controlled parenteral manufacturing.
6	Describe ocular Topical Drug Delivery, Issues and Challenges, Drug Candidate Selection, Product Design Considerations, Product Optimization Considerations, Processing Considerations. To describe physical aspects, biochemistry of protein drug ; general methods of analysis of protein & peptide drugs, barrier to transport & pharmacokinetics, different route of delivery

Bhambere D.S.
Subject I/c.

Bhujbal Knowledge City, MET's Institute of Pharmacy, Adgaon, Nashik

M. Pharm (Pharmaceutics) 2013 Pattern (Sem II)

Pharmaceutical Plant Design and Operations

Student should be able to

No.	Course Outcomes
1.	Study design, layout and operational facilities considered in the manufacturing of Pharmaceutical dosage forms like Tablets, Capsules, Liquid orals, Ointments and Dry syrups.
2.	Understand cGMP Regulatory requirements of Pharma facilities, basic requirements of Factory Act and Rules and also regulations included in revised schedule M.
3.	Know the importance of different utility services required in pharmaceutical unit operations like different types of Water, steam, Compressed air and other inert gases and also various support services required in Pharmaceutical Industries.
4.	Learn the designing and operation of Quality Control lab and related parameters like effective QMS (Quality Management System), validation protocol etc.
5.	Study the basic design of effluent treatment plant (ETP) and various treatment methods required for recycling/recovery of industrial effluent/ waste products.

(Dr. Animas S.P.)
Subject I/C.