

M.PHARMACY PROGRAMME
PHARMACEUTICS

M.PHARMACY PROGRAMME – PHARMACEUTICS

PROGRAMME OUTCOMES (PO's)

PO 1	Scientific knowledge: To apply the scientific and technological principles to design, develop effective pharmaceutical dosage forms and drug delivery systems for better therapeutic results.
PO 2	Technological applications: To utilize technical knowledge and identify any factors affecting the quality of pharmaceutical production.
PO 3	Modern tool usage: Learn, select, apply appropriate methods, procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
PO 4	Entrepreneurship: To understand the basics of establishing and management of pharmaceutical enterprise.
PO 5	Practical skills: To gain practical expertise in formulating and evaluating various novel drug release systems for minor ailments to major diseases.
PO6	Applied science: To employ contemporary scientific knowledge viz., pharmacology, biotechnology for designing disease-centric pharmaceuticals.
PO 7	Computational and statistical methodologies: Applying and utilizing the statistical tools with the aid of computer software to optimize the formulations.
PO 8	Pharmaceutical ethics: To respect personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural, personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
PO 9	Environment and sustainability: To understand, protect and cooperate environmental concerns for sustaining biodiversity.
PO10	Life-long learning: To develop the habit of updating knowledge from time to time to meet industrial demands and social needs for having a fruitful career.

M. PHARMACY PROGRAMME

PHARMACEUTICS

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

PEO 1	To impart sound pharmaceutical knowledge, scientific principles to make them ever-ready for producing quality, safety and effective pharmaceutical formulations.
PEO 2	To develop creative thinking, innovative strategies to overcome therapeutic challenges with customized medicines time to time for society.
PEO 3	To produce skilled pharmaceutical professionals, leaders, policy makers and entrepreneurs for building healthy nation.

M. PHARMACY PROGRAMME

PHARMACEUTICS (MPH)

PROGRAMME SPECIFIC OUTCOMES (PSO's)

PSO 1	Formulation strategies: To impart practical knowledge, expertise to develop, design disease-centric formulations, targeting approaches using current, advanced scientific principles for better patient care and compliance.
PSO 2	Emerging science: To introduce knowledge about emerging cutting-edge technologies and their application in pharmaceutical field with better formulations for effective treatments.
PSO 3	Computational literacy: To demonstrate the use of artificial intelligence, computer programs or software applications useful in screening formulations, interpretation of experimental data and their validation.
PSO 4	Pharmaceutical regulations: To understand the objectives, roles, functions of various pharmaceutical regulatory bodies governing quality, safety and efficacy of pharmaceuticals from manufacturing to patient door.

COURSE OUTCOMES OF M.PHARMACY PROGRAMME

Programme : I/II M.Pharmacy
Semester/Year of Study: 1st Semester
Branch : **Pharmaceutics**
Subject Name : Modern Pharmaceutical Analytical Techniques
Course code : **21S01101** (Theory)

C101.1	To recall selected instrumental analytical techniques (spectroscopic, Chromatographic, electrochemical methods) and relate with volumetric analysis.
C101.2	To gain knowledge on interaction of EMR with matter, affinity of matter with stationary phase and mobile phase, physical and chemical changes of matter on heating, potential differences in different aqueous and organic solution.
C101.3	To build the analytical understanding in the level of ion, atom, group and molecular structure of organic and inorganic compounds with different functional groups and their applications in pharmacy.
C101.4	To categorize different organic and inorganic compounds using suitable spectroscopy, chromatography, electrophoresis, thermal and immuno assay.
C101.5	To elaborate principle, theory and instruments employed for the analysis of drugs.
C101.6	To maximize knowledge of electrophoresis, immunological, thermal and X-Ray crystallographic techniques.

Programme : I/II M.Pharmacy
Semester/Year of Study : 1st Semester
Branch : **Pharmaceutics**
Subject Name : Advanced Physical Pharmaceutics
Course code : **21S0301T** (Theory)

C101.1	To recall selected instrumental analytical techniques (spectroscopic, Chromatographic, electrochemical methods) and relate with volumetric analysis.
C101.2	To gain knowledge on interaction of EMR with matter, affinity of matter with stationary phase and mobile phase, physical and chemical changes of matter on heating, potential differences in different aqueous and organic solution.
C101.3	To build the analytical understanding in the level of ion, atom, group and molecular structure of organic and inorganic compounds with different functional groups and their applications in pharmacy.
C101.4	To categorize different organic and inorganic compounds using suitable spectroscopy, chromatography, electrophoresis, thermal and immuno assay.
C101.5	To elaborate principle, theory and instruments employed for the analysis of drugs.

Programme : I/II M.Pharmacy
Semester/Year of Study : 1st Semester
Branch : **Pharmaceutics**
Subject Name : Advanced Physical Pharmaceutics
Course code : 21S03101 T (Theory)

C3101.1	Describe the particle size analysis method, solid dispersion, physics of tablets, polymer classification and its applications.
C3101.2	Explain the stability calculations, shelf life calculations and accelerated stability studies.
C3101.3	Explain the rheology, absorption related to liquids and semi-solid dosage forms.
C3101.4	State the factors affecting the dissolution and solubility in relation to <i>in-vitro/in-vivo</i> correlations.
C3101.5	To understand the various Stability testing methods follow the ICH Guidelines

Programme : I/II M.Pharmacy
Semester/Year of Study : 1st Semester
Branch : **Pharmaceutics**
Subject Name : Modern Pharmaceutics-I
Course code : **21S03102 T** (Theory)

C3102.1	Explain the Preformulation parameters, apply ICH guidelines and evaluate drug, drug excipients compatibility.
C3102.2	Explain about formulation and development, use of excipients in various solid dosage form.
C3102.3	Describe the tablets, powders, micro-encapsules and coating techniques.
C3102.4	Describe the capsules, advances in capsule manufacture, machines, processing and control including pharmaceutical aspects.
C3102.5	Apply the statistical design in different formulations.

Programme : I/II M.Pharmacy
Semester/Year of Study : 1st Semester
Branch : **Pharmaceutics**
Subject Name : Advanced Biopharmaceutics & Pharmacokinetics
Course code : **21S03103 T (Theory)**

C3103.1	Understand the various factors affecting drug absorption and apply the various regulations related to developing the BA-BE study protocol for the new drug molecule.
C3103.2	Determine the various pharmacokinetic parameters from either plasma concentration or urinary excretion data of the drug following one and multi compartment models.
C3103.3	Determine the various pharmacokinetic parameters of a drug after oral administration.
C3103.4	Summarize the concept of non-linear and clinical pharmacokinetics and their significance.
C3103.5	Understand the various causes of the pharmacokinetics and drug interactions.

Programme : I/II M.Pharmacy
Semester/Year of Study : **Ist Semester**
Branch : **Pharmaceutics**
Course Name : Modern Pharmaceutical Analytical
Techniques Lab
Course code : 21S01105 (Lab)

C1105.1	Recall and relate the principle of spectroscopy, chromatography and other commonly used instrumental methods of analysis.
C1105.2	Train the students and to give hands on training on these Sophisticated instruments.
C1105.3	Perform quantitative & qualitative analysis of drugs using various analytical instruments like UV-visible and IR spectrophotometer and HPLC.
C1105.4	Plan and select lab experiments using appropriate analytical skills. Evaluate the quantity of a drug in a given formulation.
C1105.5	Practice them on solving spectral problems and generate a comprehensive analytical report on the findings.
C1105.6	Interpret spectra of UV-visible, IR, NMR and Mass to identify the given compound.

Programme : I/II M.Pharmacy
Semester/Year of Study : Ist Semester
Branch : **Pharmaceutics**
Subject Name : Modern Pharmaceutics – I Lab
Course code : **21S03104(Lab)**

C3104.1	Perform Preformulation studies for development of various dosage forms.
C3104.2	Perform the effect of compressional force on tablet disintegration time.
C3104.3	Perform the effect of particle size and binders on dissolution of tablets.
C3104.4	Compare the dissolution efficiency of various marketed pharmaceutical products.
C3104.5	Perform the Accelerated stability testing of different tablets.
C3104.6	Determine the beta cyclodextrin complexes of new drugs and rate order constants.

Programme : I M.Pharmacy
Semester/Year of Study : 2nd Semester
Branch : **Pharmaceutics**
Subject Name : **Modern Pharmaceutics-II**
Course code : **21S03201 (Theory)**

C3201.1	Understand the planning of pilot plant techniques used for all pharmaceutical dosage forms such as tablets, capsules, parenterals, aerosols, cosmetics and neutraceuticals.
C3201.2	Describe the formulation development of parenteral dosage forms.
C3201.3	Outline the principles and formulation aspects of various aerosol dosage forms.
C3201.4	Explain the principles and formulation aspects of cosmetics and neutraceuticals.
C3201.5	Understand the concept of aseptic processing and HVAC system.

Programme : I/II M.Pharmacy
Semester/Year of Study : 2nd Semester
Branch : **Pharmaceutics**
Subject Name : **Advanced Drug Delivery System**
Course code : 21S03202 T (Theory)

C3202.1	Explain fundamentals of controlled drug delivery system.
C3202.2	Describe design, fabrication, evaluation and applications of controlled drug delivery system.
C3202.3	Summarize on transdermal drug delivery system, ocular drug delivery system.
C3202.4	Explain bioadhesive drug delivery system and nasal drug delivery system.
C3202.5	Explain on vaccine delivery for immunization.
C3202.6	Generalize on liposomes, niosomes, microspheres and nanoparticles.

Programme : I/II M.Pharmacy
Semester/Year of Study : 2nd Semester
Branch : **Pharmaceutics**
Course Name : **Industrial Pharmacy**
Course code : **21S03203 T (Theory)**

C3203.1	Explain the machinery involved in mixing, milling, filtration and drying.
C3203.2	Describe packaging material constructions used in the production of pharmaceutical materials.
C3203.3	Represent the salient features of GMP, TQM applicable in industry.
C3203.4	Explain the effluent treatment and prevention of pollution.
C3203.5	Evaluate the validation of analytical methods and processes.

Programme : I/II M.Pharmacy
Semester/Year of Study : 2nd Semester
Branch : Pharmaceutics
Subject Name : Nano Drug Delivery System
Course code : 21S03204 T (Theory)

C3204.1	Identify the right material for the formulations
C3204.2	Apply the knowledge to develop nanoformulations with appropriate technologies.
C3204.3	Evaluate the product related test and for identified diseases.
C3204.4	Understand the toxicological aspects of nanosized surfaces, particle size and stability for release of drugs.
C3205.1	Develop and evaluate mouth washes, cold cream, vanishing cream, calamine lotion, foundation creams and cleansing creams.

Programme : I/II M.Pharmacy
Semester/Year of Study : 1st Semester
Branch : Pharmaceutics
Course Name : Modern Pharmaceutics - II Lab
Course code : 21S03205 (Lab)

C3205.1	Develop and evaluate mouth washes, cold cream, vanishing cream, calamine lotion, foundation creams and cleansing creams.
C3205.2	Design and evaluate antiseptic cream, Film coated tablets, floating, fast dissolving and chewable tablets.
C3205.3	Illustrate the effect of surfactants on drug release.
C3205.4	Develop and evaluate oral rehydration solution, calcium carbonate tablets

Programme : I/II M.Pharmacy
Branch : Pharmaceutics
Course Name : Advanced Drug Delivery System Lab
Course code : 21S03206 (Lab)

C3206.1	Develop formulation and evaluate sustained release oral matrix tablets.
C3206.2	Develop formulation and evaluate microspheres.
C3206.3	Develop formulation and evaluate transdermal films.
C3206.4	Develop formulation and evaluate mucoadhesive system.
C3206.5	Develop formulation and evaluate enteric coated tablets.

Programme : I/II M.Pharmacy

Branch : **Pharmaceutics**

Course Name : Pedagogy Studies

Course code : **21DAC201a (Theory)**

C201a.1	Recognize the theories underlying methodology, searching and learning.
C201a.2	Describe the pedagogical approaches of teachers in formal and informal classrooms in developing countries practice.
C201a.3	Analysis of pedagogical practices effectiveness.
C201a.4	Describe the teacher's classroom professional development in detail.
C201a.5	Determine and fill research gaps for future research actions.

Programme : II /II M.Pharmacy

Semester/Year of Study : 3rd Semester

Branch : **Pharmaceutics**

Course Name : Research Methodology and Intellectual Property Rights

Course code : **21DRM101**

CM101.1	Understand Research Problem formulation.
CM101.2	Analyze research Related information.
CM101.3	Follow research ethics.
CM101.4	Understand that today's world is controlled by computer, Information technology, but tomorrow world will be ruled by ideas, concept, and creativity.
CM101.5	Understand that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
CM101.6	Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

Programme : II/II M.Pharmacy
Semester/Year of Study : 3rd Semester
Branch : **Pharmaceutics**
Course Name : **Pharmaceutical Validation**
Course code : **21S0E301a (Theory)**

C301a.1	Perform the validation of analytical methods.
C301a.2	Validate the manufacturing area & facilities
C301a.3	Carryout validation of manufacturing and testing equipment's.
C301a.4	Carryout validation of analytical instruments.
C301a.5	Prepare the MFR and BMR.

Subject Name: ASSIGNMENTS	
Year of Study: 1stM.Pharmacy 1st and 2nd Semester	
C.1	To recall the fundamentals of proposed topic and carry out literature review.
C.2	To classify / compare, interpret the various methods and techniques.
C.3	To organize the collected data in chronological order and develop writing skills.
C.4	To analyze the data and interpret the relationships.
C.5	To evaluate and conclude the given topic.
C.6	To propose, design research in given concept and improve presentation skills.

Subject Name: SEMINARS	
Year of Study:II M.Pharmacy 3rd Semester	
C.1	To recall the fundamentals of proposed topic and carry out literature review.
C.2	To classify / compare, interpret the various methods and techniques.
C.3	To organize the collected data in chronological order and develop writing skills.
C.4	To analyze the data and interpret the relationships.
C.5	To evaluate and conclude the given topic.
C.6	To propose, design research in given concept and improve presentation skills.

Subject Name: RESEARCH WORK I & II
Year of Study: 2ndM.Pharmacy 3rd & 4th
Semester

C.1	To recall the fundamentals, carry out literature review on proposed research topic and identify research problem.
C.2	To outline the requirements to perform the proposed research.
C.3	To construct the research hypothesis.
C.4	To take part in research experiments meticulously and documentation as per format.
C.5	To evaluate and conclude the results using statistical analysis.
C.6	To appraise societal application and appreciation.

Subject Name: Co-Curricular activities
Year of Study: 2ndM.Pharmacy 4th Semester

C.1	To select the scientific concept based on literature and define the objectives of research.
C.2	To outline the hypothesis and summarize the concept for presentation.
C.3	To plan for a meeting, discuss SWOT analysis, the design and methods used in concept.
C.4	To analyze the variables and their inter relationships.
C.5	To conclude the results and to discuss its significance.
C.6	To appraise the concept for societal needs, acknowledge and improve presentation skills.

