

## PROGRAM OUTCOMES (PO)

PO	KEY CONCEPT	EXPLANATION
PO1	<b>Research Ability</b>	An ability to independently carry out research and development work utilising modern tools and employing planning and problem analysis skills to solve practical problems
PO2	<b>Technical Communication</b>	An ability to write and present substantial technical documents / reports and communicate effectively
PO3	<b>Expertise Demonstration</b>	An ability to demonstrate a degree of mastery over the area of specialization in terms of pharmaceutical knowledge, learning aptitude, managerial and administrative skills, computational and informatics skills in academia, manufacturing, clinical and allied sectors
PO4	<b>Professional Leadership</b>	An ability to lead in terms of team building, planning, motivating and ethically executing professional responsibilities and establish professional identity in the society
PO5	<b>Environment &amp; Sustainability</b>	An ability to comprehend the impact of the pharmaceutical solutions in societal and environmental contexts, and explore the knowledge of and need for sustainable development and apply the knowledge to solve such problems.

## PROGRAM SPECIFIC OUTCOMES (PSO): PHARMACEUTICS

PSO	KEY CONCEPT	EXPLANATION
PSO1	F&D	Apply the principles of drug delivery system in designing of safe and efficacious pharmaceutical dosage forms including novel drug delivery systems and cosmetics.
PSO2	Unit Operations	Able to plan, manage and carry out unit operations for environmentally sustainable manufacturing of pharmaceuticals and cosmetics.
PSO3	Regulatory Compliance	Able to develop and evaluate new drug formulations and cosmetics meeting the regulatory specification.
PSO4	Modern tools	Able to use modern scientific instrumental and computational tools in formulation development and pharmacokinetic investigation.
PSO5	Research Methodology	Understand, plan and apply the concepts of research methodology in pharmaceutical product development and able to interact with scientific audience through writing in form of reports/thesis or presentations

**COURSE OUTCOME M. PHARM.  
PHARMACEUTICS (Old syllabus)**

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
<p><b>MPT 106</b> DOSAGE FORM DESIGN PARAMETERS &amp; PHARMACEUTICAL PRODUCT DEVELOPMENT</p>	<p><b>MPT 106.CO1:</b> Student can able to <b>implement</b> the concepts of pilot plant for the manufacturing of pharmaceutical dosage forms.</p>
	<p><b>MPT 106.CO2:</b> Student can <b>execute</b> their knowledge of preformulation studies to fabricate and develop different pharmaceutical dosage forms.</p>
	<p><b>MPT 106.CO3:</b> Students can able to <b>perform</b> various physicochemical studies and can understand their significance on drug absorption as well as on bioavailability.</p>
<p><b>MBS 101</b> BIO-STATISTICS</p>	<p><b>MBS 101.CO1:</b> <b>Identify</b> data relating to different variables and select samples.</p>
	<p><b>MBS 101. CO2:</b> <b>Discuss</b> the basic concept and importance of statistical analysis.</p>
	<p><b>MBS 101.CO3:</b> <b>Arrange</b> the results using biostatistical knowledge and make statistical decisions in pharmaceutical research.</p>
<p><b>MPT 101</b> MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES</p>	<p><b>MPT101. CO1:</b> <b>Design</b> various spectroscopic characterization techniques as well as <b>interpret</b> various spectra for characterization of compounds.</p>
	<p><b>MPT101. CO2:</b> <b>Apply</b> knowledges of separation science to separate and identify various pharmaceutical and biological ingredients from their mixture.</p>
	<p><b>MPT101. CO3:</b> <b>Utilize</b> various thermal and thermogravimetric techniques for characterization of pharmaceutical compounds and their combinations.</p>
	<p><b>MPT101. CO4:</b> <b>Develop</b> various bioassays and herbal methods for separation and characterization of biological and/or phytopharmaceutical entities.</p>
<p><b>MPT 116</b> BIO-PHARMACEUTICS &amp; PHARMACOKINETICS</p>	<p><b>MPT 116. CO1:</b> Students will be able to <b>understand</b> the need and applications of biopharmaceutical study to pharmaceuticals and factors governing product development.</p>
	<p><b>MPT 116. CO2:</b> Students will <b>learn</b> various methods of assessing bioavailability by various pharmacokinetic and pharmacodynamic studies and their application for IVIVC studies.</p>
	<p><b>MPT 116. CO3:</b> The knowledge of pharmacokinetics of a drug through proper mathematical representation will <b>enable</b> students to design dosage regimen.</p>

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	<b>MPT 116. CO4:</b> Special considerations with respect to dosage interval and physiological conditions will enlighten students to the concepts of pharmacodynamics models.
<b>MPT 181 SEMINAR</b>	<p><b>MPT 181. CO1:</b> Students can able to show competence in identifying relevant information, defining and explaining topics under discussion.</p> <p><b>MPT 181. CO2:</b> Students can able to <b>improve</b> their communication and presentation skill.</p> <p><b>MPT 181. CO3:</b> Students can<b>engage</b> with works that are widely held to be significant in the field of pharmaceutical research.</p>
<b>MPT 191 PHARMACEUTICAL ANALYSIS LAB</b>	<p><b>MPT191. CO1:</b> The students would be able to <b>understand</b> different spectroscopic analysis, their theory and application range based on their functions.</p> <p><b>MPT191. CO2:</b> The students would be able to <b>apply</b> their knowledge in method development and results interpretation of various spectroscopic analysis.</p> <p><b>MPT191. CO3:</b> The students will be able to <b>design</b> various microbiological assays involving Vitamins and Antibiotics.</p> <p><b>MPT191. CO4:</b> The students will be able to <b>construct</b> various pharmacological assays depending upon the drug of choice.</p>
<b>MPT 206(1) DRUG DELIVERY SYSTEM</b>	<p><b>MPT 206(1). CO1:</b> To <b>explain</b> various approaches for development of novel drug delivery system and <b>defining</b> need for drug targeting in case in terms of site and target specificity.</p> <p><b>MPT 206(1). CO2:</b> To <b>determine</b> selection of suitable polymers along with drugs for formulation design and to develop various delivery systems for a specific drug target for NTDS</p> <p><b>MPT 206(1). CO3:</b> To <b>determine evaluation</b> for the developed targeted drug delivery system and to <b>analyse</b> the formulation approaches with the accurate pharmaceutical processes for site specific drug delivery.</p>
<b>MPT 209 PHARMACEUTICAL BIOTECHNOLOGY</b>	<p><b>MPT209 .CO1:</b> Gain Technical skills involved in extraction, manipulation of biomolecules and identification of gene and its expressions.</p> <p><b>MPT209. CO2:</b> <b>Develop</b> and <b>apply</b> the modern technology of genetic engineering in industries and Fermentation processes for the human welfare.</p> <p><b>MPT209. CO3:</b> <b>Understand</b> and <b>evaluate</b> the different pharmaceutical parameters of the current and future biotechnology related pharmaceutical products in the market</p>
<b>MPT-212</b>	<b>MPT212. CO1:</b> Students will be able to <b>understand</b> the need and application validation in pharmaceutical industry.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
PROCESS VALIDATION & CGMP	<b>MPT212. CO2:</b> Students will be able to <b>understand</b> the concepts of quality practices for certification standards in pharmaceutical industry.
	<b>MPT212. CO3:</b> Students will <b>develop</b> the knowledge about the various regulatory agencies and their role.
	<b>MPT212. CO4:</b> Students will <b>learn</b> to apply different laws and guidelines for drug registration and approval process.
MPT 206(2) PHYSICAL PHARMACEUTICS	<b>MPT 206(2). CO1:</b> Students can <b>develop</b> the different solid dosage form by utilizing different parameters.
	<b>MPT 206(2). CO2:</b> Students can able to <b>perform</b> dissolution of different dosage form.
	<b>MPT 206(2). CO3:</b> The students can be able to <b>solve</b> different problems related to solubility, permeability etc with the knowledge of surfactant system.
MPT 281 SEMINAR	<b>MPT 281. CO1:</b> Students shall be able to <b>communicate</b> with the scientific community in a confident manner.
	<b>MPT 281. CO2:</b> Student shall be able to <b>recognize</b> the societal issues related to healthcare, <b>analyse</b> and <b>solve</b> them
	<b>MPT 281. CO3:</b> Students shall be proficient in interpreting scientific data to <b>defend</b> the relevant topic.
MPT 296 BIO-PHARMACEUTICS LAB	<b>MPT 296. CO1:</b> To <b>design</b> single dose bioavailability study and relevant statistics.
	<b>MPT 296. CO2:</b> To <b>perform</b> testing of dosage forms on animal and collection of plasma.
	<b>MPT 296. CO3:</b> To <b>interpret</b> data obtained from animal experiments and estimate dosing frequency.
MPT314 RESEARCH METHODOLOGY AND CLINICAL TRIALS	<b>MPT 314. CO1:</b> Students will be able to <b>implement</b> the regulatory requirements and follow ethics while conducting clinical trials.
	<b>MPT 314. CO2:</b> Students will be able to <b>design</b> and <b>manage</b> clinical trial coordination process.
	<b>MPT 314. CO3:</b> Students shall <b>appreciate</b> statistical techniques in solving the problems.
MPT391 SYNOPSIS	<b>MPT 391. CO1:</b> Students will be able to <b>categorize</b> relevant information for <b>defining</b> and <b>explaining</b> the topic for presentation.



NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	<b>MPT 391. CO2:</b> In terms of <b>summarizing</b> and organizing the whole methodology, students will be able structure their oral work and <b>composing</b> information.
	<b>MPT 391. CO3:</b> Students will be able to <b>build</b> appropriate vocabularies with voice modulation, voice projection and pacing.
MPT392 PRESENTATION	<b>MPT 392. CO1:</b> Students can <b>develop</b> a structured presentation methodology to prepare presentation material and effective visual aids.
	<b>MPT 392. CO2:</b> Students can able to percolate his knowledge to the audiences.
	<b>MPT 392. CO3:</b> The students can be able to <b>Determine</b> and <b>develop</b> personal style.
MPT 496 THESIS	<b>MPT 496. CO1:</b> The students would be able to <b>learn</b> different types of scholarly sources and <b>analyse</b> them.
	<b>MPT496. CO2:</b> The students would be able to <b>analyse</b> the gaps and <b>evaluate</b> them.
	<b>MPT 496. CO3:</b> The students would be able to <b>build</b> problem solving skills and <b>execute</b> them to research in the related fields.
	<b>MPT 496. CO4:</b> The students would be able to <b>design</b> plan of work, <b>execute</b> them and <b>interpret</b> the data to evaluate the work.
	<b>MPT 496. CO5:</b> The students would be able to <b>write</b> their research reports constituting Introduction, Experimental Methods, Results & Discussion, Conclusion and References.

**COURSE OUTCOME: M. PHARM.  
PHARMACEUTICS (New syllabus)**

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
<p align="center"><b>MPT 1061</b> MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES</p>	<p><b>MPT 1061. CO1: Determine</b> the role of various drug excipients interaction.</p>
	<p><b>MPT 1061. CO2: Apply</b> the knowledge to undertake various analytical instrumental studies such as spectroscopic, separation science, thermal, biotechnological and crystallography-based studies</p>
	<p><b>MPT 1061. CO3: Evaluate</b> various results and interpretations of such instrumental techniques, solve any existing problems.</p>
	<p><b>MPT 1061. CO4: Develop</b> newer analytical methods by instrumental techniques.</p>
<p align="center"><b>MPT 1062</b> DRUG DELIVERY SYSTEMS</p>	<p><b>MPT 1062. CO1:</b> Students can able to <b>build</b> their concept and knowledge of novel drug delivery systems.</p>
	<p><b>MPT 1062. CO2:</b> Students can <b>implement</b> their knowledge for selection of drugs and polymers for the development of novel drug delivery systems.</p>
	<p><b>MPT 1062. CO3:</b> Students can be able to <b>develop</b> and <b>evaluate</b> various novel drug delivery systems.</p>
<p align="center"><b>MPT 1063</b> MODERN PHARMACEUTICS</p>	<p><b>MPT 1063. CO1: Apply</b> the preformulation parameters through an optimized approach for designing a viable pharmaceutical product.</p>
	<p><b>MPT 1063. CO2: Review</b> the policies of good manufacturing practice and implement the concept of total quality management.</p>
	<p><b>MPT 1063. CO3: Apply</b> statistical tools for determining the stability of pharmaceutical tablets.</p>
<p align="center"><b>MPT1064</b> REGULATORY AFFAIR</p>	<p><b>MPT 1064. CO1: Apply</b> the significance of regulatory guidelines in documentation and fulfilling of regulatory criteria for drug product approval and registration.</p>
	<p><b>MPT 1064. CO2: Understand</b> the regulatory framework of different countries and concept of harmonization of regulatory guidelines.</p>
	<p><b>MPT 1064. CO3: Evaluate</b> strategies for non-clinical drug development in the regulatory framework.</p>
	<p><b>MPT 1064. CO4:</b> Student can able to <b>conduct</b> clinical trials after getting the proper approval from the regulatory method.</p>

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
<p style="text-align: center;"><b>MPT 1965</b> PHARMACEUTICS PRACTICAL I</p>	<p><b>MPT 1965. CO1:</b> Students will able to <b>develop</b> the analytical method of the supplied sample by various analytical instrumentation methods.</p>
	<p><b>MPT 1965. CO2:</b> Students will able to <b>perform</b> preformulation studies and implement their knowledge to develop various novel drug delivery systems.</p>
	<p><b>MPT 1965. CO3:</b> Students can <b>utilize</b> their knowledge to formulate and evaluate various novel drug delivery systems.</p>
<p style="text-align: center;"><b>MPT 1986</b> SEMINAR</p>	<p><b>MPT 1986. CO1:</b> Students can able to <b>show</b> competence in identifying relevant information, defining and explaining topics under discussion.</p>
	<p><b>MPT 1986. CO2:</b> Students can able to <b>improve</b> their communication and presentation skill.</p>
	<p><b>MPT 1986. CO3:</b> Students can <b>engage</b> with works that are widely held to be significant in the field of pharmaceutical research.</p>
<p style="text-align: center;"><b>MPT 2061</b> MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY &amp; TARGETED DDS)</p>	<p><b>MPT 2061. CO1:</b> Students can able to <b>implement</b> their knowledge on various approaches of novel drug delivery system.</p>
	<p><b>MPT 2061. CO2:</b> Students can able to <b>gather</b> a clear concept on drug and formulation components required for designing novel drug delivery systems.</p>
	<p><b>MPT 2061. CO3:</b> Students can <b>utilize</b> their knowledge to fabricate targeted drug delivery systems.</p>
<p style="text-align: center;"><b>MPT 2062</b> ADVANCED BIO PHARMACEUTICS &amp; PHARMACOKINETICS</p>	<p><b>MPT 2062. CO1:</b> <b>Understand</b> the mechanism of drug absorption and the various factors affecting the movement of the drug in the body.</p>
	<p><b>MPT 2062. CO2:</b> Students can able to <b>analyse</b> concept and significance of dissolution testing and their mathematical validation for optimization of drug bioavailability.</p>
	<p><b>MPT 2062. CO3:</b> Students can able design and derive pharmacokinetic models for quantitative study of drug ADME (drug absorption, distribution, metabolism and elimination).</p>
	<p><b>MPT 2062. CO4:</b> Students can able evaluate the role of bioavailability and bioequivalence studies using biopharmaceutic and pharmacokinetic parameters.</p>
<p style="text-align: center;"><b>MPT 2063</b> COMPUTER AIDED DRUG DELIVERY SYSTEM</p>	<p><b>MPT 2063. CO1:</b> Optimize the biopharmaceutical characteristics of a drug or pharmaceutical product through virtual simulations.</p>
	<p><b>MPT 2063. CO2:</b> Review the various protocols for management of clinical data and adherence to regulatory guidelines.</p>
	<p><b>MPT 2063. CO3:</b> Nurture the idea of artificial intelligence and its applications in the automation in pharmaceutical industry.</p>



NAME OF THE COURSE WITH CODE	COURSE OUTCOME
<p><b>MPT2064</b> COSMETIC AND COSMECEUTICALS</p>	<p><b>MPT 2064. CO1:</b> Utilize the knowledge of regulatory requirement for the manufacturing of cosmetics.</p>
	<p><b>MPT 2064. CO2:</b> Prepare different cosmetics and cosmeceuticals.</p>
	<p><b>MPT 2064. CO3:</b> Evaluate the different formulation as per different official book.</p>
<p><b>MPT 2965</b> PHARMACEUTICS PRACTICAL II</p>	<p><b>MPT 2965. CO1:</b> To prepare and characterize various polymer-based formulations for drug encapsulation.</p>
	<p><b>MPT 2965. CO2:</b> To interpret the effect of formulation processing parameters on pharmacokinetic profile of the drugs.</p>
	<p><b>MPT 2965. CO3:</b> To develop and evaluate different kinds of cosmeceutical products.</p>
<p><b>MPT 2986</b> SEMINAR</p>	<p><b>MPT 2986. CO1:</b> Students can able to show competence in identifying relevant information, defining and explaining topics under discussion.</p>
	<p><b>MPT 2986. CO2:</b> Students can able to improve their communication and presentation skill.</p>
	<p><b>MPT 2986. CO3:</b> Students can engage with works that are widely held to be significant in the field of pharmaceutical research.</p>
<p><b>MPT 381</b> JOURNAL CLUB</p>	<p><b>MPT 381. CO1:</b> To search articles from various scientific databases.</p>
	<p><b>MPT 381. CO2:</b> To prepare a technical presentation for a small audience.</p>
	<p><b>MPT 381. CO3:</b> To deliver a presentation and address related queries.</p>
<p><b>MPT 384</b> RESEARCH METHODOLOGY &amp; BIOSTATISTICS</p>	<p><b>MPT 384.CO1: Discuss and explain</b> different methods and technologies used to carry out research work.</p>
	<p><b>MPT 384.CO2: Assess</b> the basic principles and working of analytical instrument in carrying out research work.</p>
	<p><b>MPT 384.CO3: Implement</b> the regulatory requirements and follow ethics while conducting clinical trials.</p>
	<p><b>MPT 384. CO4: Demonstrate</b> expertise in carrying out statistical analysis of the research findings.</p>
<p><b>MPT 391</b> DISCUSSION/ PRESENTATION (PROPOSAL)</p>	<p><b>MPT 391. CO1:</b> Students will be able to <b>categorize</b> relevant information for <b>defining</b> and <b>explaining</b> the topic for presentation.</p>

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	<p><b>MPT 391. CO2:</b> In terms of <b>summarizing</b> and organizing the whole methodology, students will be able structure their oral work and <b>composing</b> information.</p>
	<p><b>MPT 391. CO3:</b> Students will be able to <b>build</b> appropriate vocabularies with voice modulation, voice projection and pacing.</p>
<p><b>MPT392</b> RESEARCH WORK</p>	<p><b>MPT 392. CO1:</b> Students can develop a structured presentation methodology to prepare presentation material and effective visual aids</p>
	<p><b>MPT 392. CO2:</b> Students can able to percolate his knowledge to the audiences.</p>
	<p><b>MPT 392. CO3:</b> The students can be able to Determine and develop personal style.</p>
<p><b>MPT 481</b> JOURNAL CLUB</p>	<p><b>MPT 481. CO1:</b> To search articles from various scientific databases.</p>
	<p><b>MPT 481. CO2:</b> To prepare a technical presentation for a small audience.</p>
	<p><b>MPT 481. CO3:</b> To deliver a presentation and address related queries.</p>
<p><b>MPT 491</b> FINAL PRESENTATION</p>	<p><b>MPT 491. CO1:</b> Students will be able to <b>categorize</b> relevant information for <b>defining</b> and <b>explaining</b> the topic for presentation.</p>
	<p><b>MPT 491. CO2:</b> In terms of <b>summarizing</b> and organizing the whole methodology, students will be able structure their oral work and <b>composing</b> information.</p>
	<p><b>MPT 491. CO3:</b> Students will be able to <b>build</b> appropriate vocabularies with voice modulation, voice projection and pacing.</p>
<p><b>MPT 492</b> RESEARCH WORK</p>	<p><b>MPT 492. CO1:</b> The students would be able to <b>build</b> problem solving skills and <b>execute</b> them to research in the related fields</p>
	<p><b>MPT 492. CO2:</b> The students would be able to <b>design</b> plan of work, <b>execute</b> them and <b>interpret</b> the data to evaluate the work</p>
	<p><b>MPT 492. CO3:</b> The students would be able to <b>write</b> their research reports constituting Introduction, Experimental Methods, Results &amp; Discussion, Conclusion and References</p>