



P.K.M Educational Trust (R)

# R.R. COLLEGE OF PHARMACY

Chikkabanavara, Bangalore-560090

Affiliated to Rajiv Gandhi University of Health Sciences Bangalore, and recognised by PCI, AICTE and Govt of Karnataka

Internal Quality Assurance Cell

## Course out Comes and Programme outcomes (PO)

**Name of Course:** Modern Pharmaceutical Analytical Techniques

**Program:** M. PHARM I SEM

**Section:** Theory (60 Hours)

**ACADEMIC YEAR :** 2019-2020

**Faculty in Charge:** Mr. Syed Nizamuddin

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Explain general principles and theory of spectroscopy	U	F,C,P	PO1,PO3,PO4.
02	Understand the basic instrumentation of HPTLC, HPLC, GC for identification, and characterization of compounds.	U	C,P	PO1,PO3,PO4.
03	Understand the basic concept and instrumentation of Chromatographic techniques and identification of compounds by electrophoresis technique.	U	C,P	PO1,PO3,PO4.
04	Understand the basic concept and instrumentation of nmr & mass spectrophotometer	U	C,P	PO1,PO3,PO4.
05	Understand the basic principles and instrumentation of fluorimeter and atomic absorption spectrometer	U	C,P	PO1,PO3,PO4.
06	Identify organic compounds by -X-ray crystallography	U	C,P	PO1,PO3.



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## Course out Comes and Programme outcomes (PO)

**Name of Course:** Modern Pharmaceutical Analytical Techniques

**Program:** M. PHARM I SEM

**Section:** Practical

**ACADEMIC YEAR :** 2019-2020

**Faculty in Charge:** Mr. Syed Nizamuddin

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Demonstrate the working procedure of UV-Visible Spectroscopy and explain the study of max.	U	F,C,P	PO1,PO3,PO4.
02	Experiment with UV -Visible Spectroscopy and determine the Percentage purity of Drugs and Formulation.	U	C, P	PO1,PO3,PO4.
03	Measure the amount and percentage purity of Drug and formulation by using HPLC and GC.	U	C, P	PO1,PO3,PO4.
04	Utilize the Flame photometry equipment to determine the concentration of metals	U	C, P	PO1,PO3,PO4.
05	Discuss the interpretation of Mass spectrum with the support of Mass spectrum	U	C, P	PO1,PO3,PO4.
06	Utilize the fluorimetry equipment to determine the concentration of fluorescent compounds	U	C, P	PO1,PO3,PO4.



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## Course out Comes and Programme outcomes (PO)

**Name of Course:** Modified Release Drug Delivery System

**Program:** M. PHARM I SEM

**Section:** Theory (60 Hours)

**ACADEMIC YEAR:** 2019-2020

**Faculty in Charge:** Mrs. Sujatha P M

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Understand the various approaches for development of novel drug delivery systems.	R and U	C	PO1 and PO11
02	Understand the various approaches for development of rate controlled drug delivery systems.	R and U	C	PO1 and PO11
03	Explain the gastro retentive drug delivery systems.	U, A and E	C and P	PO1, PO2, PO4 and PO11
04	Understand ocular drug delivery systems and vaccine delivery systems.	R and U	C	PO1 and PO11
05	Explain the transdermal drug delivery systems.	U, A and E	C and P	PO1, PO2, PO4 and PO11
06	Understand the protein and peptide delivery.	R and U	C	PO1, PO2and PO11



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## Course out Comes and Programme outcomes (PO)

**Name of Course:** Modern Pharmaceutics

**Program:** M. PHARM I SEM

**Section:** Theory (60 Hours)

**ACADEMIC YEAR:** 2019-20

**Faculty in Charge:** Dr. A Geethalakshmi

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Understand the elements of pre-formulation studies. API and generic drug product development.	R, U and A	C and P	PO1, PO4 and PO11
02	Explain the optimization techniques in pharmaceutical formulations.	R, A, and U	C and P	PO1, PO2, PO3 and PO11
03	Understand the pharmaceutical validation.	R and U	C	PO1 and PO11
04	Describe cGMP and industrial management.	R and U	C	PO1 and PO11
05	Determine the compression and compaction of tablets.	R, U A and E	C and P	PO1, PO2, PO3 PO4 and PO11
06	Calculate the consolidation parameters.	R, A, and U	C and P	PO1, PO2, PO3 PO4 and PO11



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## Course out Comes and Programme outcomes (PO)

**Name of Course:** Pharmaceutics I

**Program:** M. PHARM I SEM

**Section:** Practical

**ACADEMIC YEAR:** 2019-2020

**Faculty in Charge:** Dr. A. Geethalaksmi

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Perform In-vitro dissolution profile of CR/ SR marketed formulation and the effect of compressional force on tablets disintegration time.	AP, E	C,P	PO2,PO3,PO4, PO11
02	Perform Preformulation studies of tablets and Micromeritics properties of powders and granulation	Ap, E	C,P	PO2,PO3,PO4, PO11
03	Perform the effect of particle size on dissolution of a tablet and effect of binders on dissolution of a tablet	AP, E	C,P	PO2,PO3,PO4, PO11
04	Plot Heckal plot, Higuchi and peppas plot and determine similarity factors.	AP, E	C,P	PO2,PO3,PO4, PO11
05	Formulate and evaluate the sustained release matrix tablets osmotically controlled DDS	AP, E	C,P	PO2,PO3,PO4, PO11
06	Prepare and evaluate Floating DDS, Muco adhesive tablets & trans dermal patches	AP, E	C,P	PO2,PO3,PO4, PO11



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## Course out Comes and Programme outcomes (PO)

**Name of Course:** Regulatory Affairs

**Program:** M. PHARM

**Section:** Theory (60 Hours)

**ACADEMIC YEAR:** 2019-2020

**Faculty in Charge:** MR. Subhash P G

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Explain the Regulatory guidance's and guidelines for filling and approval process.	U	F,P	PO1,PO2,PO6
02	Summarize the post regulatory affairs and ICH guidelines.	U,AP	C,P,AN	PO1,PO2,PO3,PO4,PO11
03	Summarize the global submission of IND,NDA and ANDA	U,AP	C	PO1,PO2,PO3, PO4, PO11
04	Explain the preparation of Dossiers and their submission to regulatory agencies .	U	C,P	PO1,PO2,PO4
05	Summarize Pharmacovigilance and process of clinical monitoring.	U	F	PO1,PO2,PO6



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## Course out Comes and Programme outcomes (PO)

**Name of Course:** Molecular Pharmaceutics (Nano Tech and Targeted DDS)

**Program:** M. PHARM II SEM

**ACADEMIC YEAR:** 2019-2020

**Section:** Theory (60 Hours)

**Faculty in Charge:** Dr. A Geethalakshmi

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
Upon completion of the course student shall be able to:				
01	Understand Quality-by-Design in Pharmaceutical Development.	AP, E	C,P	PO2,PO3,PO4, PO11
02	Perform DoE Using Design Expert® Software Formulation data analysis Using Design Expert® Software.	AP, E	C,P	PO2,PO3,PO4, PO11
03	Perform the effect of temperature change , non- solvent addition, incompatible polymer addition in microcapsules preparation	AP, E	C,P	PO2,PO3,PO4, PO11
04	Formulate and evaluate Alginate beads, gelatin /albumin microspheres	AP, E	C,P	PO2,PO3,PO4, PO11
05	Formulate and evaluate liposomes/niosomes & spherules	AP, E	C,P	PO2,PO3,PO4, PO11
06	Explain Computer Simulations in Pharmacokinetics and Pharmacodynamics and Computational Modeling Of Drug Disposition	AP, E	C,P	PO2,PO3,PO4, PO11



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## Course out Comes and Programme outcomes (PO)

**Name of Course:** Advanced Biopharmaceutics & Pharmacokinetics.

**Program:** M. PHARM II SEM

**Section:** Theory (60 Hours)

**ACADEMIC YEAR:** 2019-2020

**Faculty in Charge:** Mrs. Sujatha P M

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Understand the basic concepts in Biopharmaceutics and pharmacokinetics and their significance.	U, AP	C	PO1, PO10, PO11
02	Understand the concepts of bioavailability and bioequivalence of drug products and their significance.	U, AP	C &P	PO1, PO10, PO11
03	Apply Pharmacokinetics: One compartment open model .a. Intravenous Injection (Bolus) b. Intravenous infusion. Multi compartment model, Two compartment open model. Explain Non-Linear pharmacokinetics.	U, AP	C&P	PO1, PO10, PO11
04	Apply bioavailability and bioequivalence of drug products	U, AP	C&P	PO1, PO10, PO11
05	Apply pharmacokinetics for MRDDS and TDDS. Understand proteins and peptides.	U, AP	C&P	PO1, PO10, PO11





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## Course out Comes and Programme outcomes (PO)

**Name of Course: Computer Aided Drug Delivery Systems**

**Program: M. PHARM II SEM**

**Section: Theory (60 Hours)**

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**ACADEMIC YEAR: 2019-2020**

**Faculty in Charge: Mr. Subhash P**

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Understand the Computers in Pharmaceutical Research and Development	R, U and A	C and P	PO1, PO4 and PO11
02	Explain the Computational Modeling of Drug Disposition	R, U A and E	C and P	PO1, PO2, PO3 , PO4 and PO11
03	Understand the Computer-aided formulation development	R, U A and E	C and P	PO1, PO2, PO3, PO4 and PO11
04	Describe Computer-aided biopharmaceutical characterization	R, U A and E	C and P	PO1, PO2, PO3, PO4 and PO11
05	Explain the artificial Intelligence (AI), Robotics and Computational fluid dynamics	R, U A and E	C and P	PO1, PO2, PO3, PO4 and PO11



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## Course out Comes and Programme outcomes (PO)

**Name of Course: Cosmetics & Cosmeceuticals**

**Program: M. PHARM II SEM**

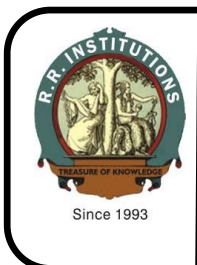
**Section: Theory (60 Hours)**

**ACADEMIC YEAR: 2019-2020**

**Faculty in Charge: Mrs K.S.Srilatha**

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Explain the formulations approaches and requirements as per EU Guidelines.	U	F,P	PO1,PO2,PO6
02	Summarize the plant layout ,factory requirements and commonly used cosmetics raw materials	U,AP	C,P,AN	PO1,PO2,PO3,PO4,PO11
03	Summarize the design of special purpose cosmeceutical product.	U,AP	C	PO1,PO2,PO3, PO4, PO11
04	Explain various Herbal ingredients used in Herbal cosmetics.	U	C,P	PO1,PO2,PO4
05	Summarize cosmetics safety and formulation of lip care product.	U	F	PO1,PO2,PO6



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## Course out Comes and Programme outcomes (PO)

**Name of Course:** Pharmaceutics II

**Program:** M. PHARM II SEM

**Section:** Practical

**ACADEMIC YEAR:** 2019-2020

**Faculty in Charge:** Mrs. Sujatha P M

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Apply & evaluate solid dispersion technique ,highly & poorly protein bound drug and dissolution of two marketed products.	U & AP	C & P	PO1,PO2 &PO3
02	Determine & apply bioavailability studies of paracetamol	U & AP	C&P	PO1,PO2&PO3
03	Apply & evaluate pharmacokinetic & IVIVC data analysis, in vitro cell studies for permeability.	U & AP	C&P	PO1,PO2&PO3
04	Apply DoE Using design Expert,Quality –by-design ,computer simulations in pharmacokinetics & pharmacodynamics	U & AP	C&P	PO1,PO2&PO3
05	Apply & evaluate computational modeling of drug disposition ,develop clinical data modeling, creams, shampoo, toothpaste.	U& AP	C&P	PO1 ,PO2&PO3
06	Understand herbal & chemical activities to develop products .Dry skin,acne,blemish, wrinkles,bleeding gums & dandruff.	U & AP	C&P	PO1,PO4



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## Course out Comes and Programme outcomes (PO)

**Name of Course: Research Methodology And Biostatistics**

**Program: M. PHARM III SEM**

**Section: Theory**

**ACADEMIC YEAR : 2019-2020**

**Faculty in Charge: Mr. K Mahalingan**

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Formulation of various cosmetics	R, U, AP	F, C,P	PO1, PO3, PO4, PO11.
02	Formulation of dermatological preparations, herbal tablets, capsules, aromatherapy formulations & cough syrup.	R, U, AP, An	F, C, P	PO1, PO3, PO4, PO9, PO11.
03	Preparation and standardization of Ayurveda, Siddha, Homeopathy and Unani formulary	R, U, AP, An, E	F, C, P	PO1, PO3, PO4, PO9, PO11.