

## PROGRAM OUTCOMES (POs) FOR ALL PROGRAMMES

PO No.	PROGRAM OUTCOMES (POs)	
<b>PO1</b>	<b>Pharmacy Knowledge</b>	Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioural, social, and administrative pharmacy sciences; and manufacturing practices.
<b>PO2</b>	<b>Planning Abilities</b>	Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
<b>PO3</b>	<b>Problem Analysis</b>	Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
<b>PO4</b>	<b>Modern tool usage</b>	Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
<b>PO5</b>	<b>Leadership skills</b>	Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.
<b>PO6</b>	<b>Professional Identity</b>	Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
<b>PO7</b>	<b>Pharmaceutical Ethics</b>	Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and 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.
<b>PO8</b>	<b>Communication</b>	Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
<b>PO9</b>	<b>The Pharmacist and society</b>	Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
<b>PO10</b>	<b>Environment and Sustainability</b>	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO11</b>	<b>Life-long learning</b>	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use of feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.



# JOGINPALLY B. R. PHARMACY COLLEGE

**PROGRAM: B PHARMACY (R17)**  
**(Batch 2019-2023)**

## COURSE OUTCOMES (COs)

### I year I semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Human Anatomy and Physiology I	BP.C111T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain the gross morphology, structure, functions of various organs/ systems of the human body
		CO2	Describe various homeostatic mechanisms & their imbalances
		CO3	Identify various tissues and organs of different systems of human body
		CO4	Demonstrate various experiments related to systems & specific senses of body
		CO5	Interpret coordinated working pattern of different organs of each system
Pharmaceutical Analysis I	BP.C112T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Prepare different concentrations of solutions
		CO2	Conduct various volumetric titrations
		CO3	Perform different analytical titrations
		CO4	Perform different electrochemical methods of analysis

		CO5	Apply various procedures involved in titrations of electrochemical methods
Pharmaceutics - I	BP.C113T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Illustrate the history of Profession of Pharmacy and Pharmacopoeias
		CO2	Explain different dosage forms, pharmaceutical incompatibilities and calculations
		CO3	Describe the parts of Prescription and handling of Prescription
		CO4	Prepare conventional dosage forms according to standard formula of IP
		CO5	Explain factors affecting Posology and Pediatric dose calculations
Pharmaceutical Inorganic Chemistry	BP.C114T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain the importance of pharmacopoeia in medicines preparation and discuss the methods to determine & purification techniques of the impurities
		CO2	Describe in detail about the importance & applications of acid bases & buffers
		CO3	Explain in detail about gastrointestinal agents
		CO4	Discuss in detail about miscellaneous agents/ pharmaceutical agents
		CO5	Describe the applications of the radiopharmaceuticals
Communication skills	BP.C115T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Summarize communication skills
		CO2	Evaluate elements and styles of communication (verbal & non-verbal)
		CO3	Develop basic listening skills and effective written communication
		CO4	Analyze interview skills (Do's and Dont's)and plan the presentations
		CO5	Develop and defend in Group Discussion for enhancing leadership qualities
Remedial Mathematics	BP.C117T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Solve the different types of pharmaceutical problems by applying Partial Fractions,

			Logarithms, Functions & Limits
		CO2	Choose proper methods of matrices and determinants to solve pharmacokinetic equations
		CO3	Differentiate the different types of problems by applying the derivatives
		CO4	Solve the different types of problems by using the concept of straight lines and integrations
		CO5	Evaluate the method of solving the differential equations and Laplace transforms to solve chemical kinetics and pharmacokinetics equations

I year II semester			
Course/Subject name	Course Code	Course Outcome number	Course Outcome
Human Anatomy and Physiology II	BP.C121T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain the structure and functions of various systems of the human body
		CO2	Describe various homeostatic mechanisms and their imbalances, which cause diseases/ disorders in human body
		CO3	Perform haematological tests and record BP, heart rate, pulse and respiratory volumes
		CO4	Identify and describe various tissues and organs of different systems of human body
		CO5	Explain the concepts related to genetics
Pharmaceutical Organic Chemistry-I	BP.C122T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain Nomenclature, Isomerism, types of organic reactions
		CO2	Describe about alkanes, alkenes, conjugated dienes

		CO3	Explain about alkyl halides, alcohols reactions
		CO4	Summarize carbonyl compounds
		CO5	Illustrate carboxylic acids, aliphatic amines reactions
Biochemistry	BP.C123T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain importance of metabolic pathways of Carbohydrates metabolism
		CO2	Describe Lipid metabolism and its importance
		CO3	Explain metabolic pathways of Amino acid metabolism
		CO4	Describe Nucleic acid metabolism and its importance
		CO5	Illustrate the importance of Enzymes
Pathophysiology	BP.C124T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the etiology and pathogenesis of selected diseases and process of injury and inflammation
		CO2	Explain about signs and symptoms of the disease
		CO3	Compare and contrast pathophysiological aspects of various diseases
		CO4	Apply the knowledge of pathophysiology for safe practice of medicine
		CO5	Decide rational and effective drug use
Computer Applications in Pharmacy	BP.C125T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Use Basic Number Systems and concept of information systems and softwares
		CO2	Compare Web Technologies (HTML, XML, CSS, etc)
		CO3	Apply the knowledge of Computers in Pharmacy
		CO4	Summarize Bioinformatics and its applications
		CO5	Integrate computer data analysis in Pre-clinical Development

## II year I semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Pharmaceutical Organic Chemistry-II	BP.C211T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain the chemical aspects and reactions of organic compounds
		CO2	Interpret the methods of preparation and properties of organic compounds
		CO3	Describe the aromaticity and reactivity of the heterocyclic compounds
		CO4	Summarize the medicinal uses and other applications of polynuclear aromatic Hydrocarbons
		CO5	Describe the stability and reactivity of cycloalkanes
Physical Pharmaceutics-I	BP.C212T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Compare States of matter; explain properties of matter and physicochemical properties of drug molecules
		CO2	Analyze solubility of drugs, dissolution, diffusion and distribution of drugs
		CO3	Analyze properties of powders, particles depending on their sizes and distribution
		CO4	Illustrate the concept of Complexation and protein binding
		CO5	Explain about p <sup>H</sup> , buffers and isotonic solutions
Pharmaceutical Microbiology	BP.C213T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the scope of Microbiology, importance of microorganisms, nutritional

			requirements, Isolation and preservation methods
		CO2	Choose proper identification test, sterilization and disinfection method, evaluation of sterilization by performing sterility testing
		CO3	Describe the morphology, classification, reproduction, replication of fungi and virus, factors affecting disinfection, evaluation
		CO4	Explain importance of aseptic area, laminar air flow, sources of contamination, methods of standardization of antibiotics, vitamins and aminoacids
		CO5	Describe various types of spoilage, factors affecting preservation of pharmaceutical products, concepts of animal cell culture methods and applications
Pharmaceutical Engineering	BP.C214T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Illustrate various operations used in Pharma industry
		CO2	Demonstrate material handling techniques
		CO3	Apply various process involved in Pharma industry
		CO4	Perform various tests to prevent pollution
		CO5	Construct plant layout, design for optimum use of resources

## II year II semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Pharmaceutical Organic	BP.C221T	<b>Upon completion of the course, student will be able to</b>	



Chemistry-III		CO1	Explain the methods of preparation and properties of organic compounds
		CO2	Describe the stereo chemical aspects and reactions of organic compounds
		CO3	Describe the aromaticity and reactivity of the heterocyclic compounds
		CO4	Summarize medicinal uses and other applications of organic compounds
		CO5	Describe the named reactions and synthetic importance
Medicinal Chemistry I	BP.C222T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain the importance of SAR towards pharmacology
		CO2	Describe in detail about metabolic reactions (phase-I & phase-II)
		CO3	Discuss the structure, chemistry & pharmacology of the drugs
		CO4	Describe the synthesis of important drugs
		CO5	Explain about anti-inflammatory agents
Physical Pharmaceutics-II	BP.C223T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the Reaction kinetics, reaction order, factors affecting the rate of reaction and stability testing
		CO2	State the derived flow properties of powders and understand the flow behavior of fluids and formulation development
		CO3	Explain the formulation concepts of Pharmaceutical Suspensions and Emulsion; and their stability problems
		CO4	Describe the role of Surfactants and interfacial phenomenon in formulation development
		CO5	Discuss the concept of Colloids and methods to determine the particle size in formulation development
Pharmacology - I	BP.C224T	<b>Upon completion of the course, student will be able to</b>	

		CO1	Describe the pharmacological aspects of drugs falling under various categories
		CO2	Appreciate the importance of pharmacology subject in clinical aspects
		CO3	Apply the Pharmacology knowledge of drugs therapeutically
		CO4	Demonstrate the Pharmacology of drugs acting on CNS, ANS
		CO5	Illustrate the concept of drug dependance, tolerance and addiction
Pharmacognosy and Phytochemistry-I	BP.C225T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the history of pharmacognosy, classification of drugs, and quality control of drugs
		CO2	Illustrate the principles and production of plant cultivation, collection, processing, and storage of drugs of natural origin
		CO3	Describe plant tissue culture
		CO4	Explain the role of pharmacognosy in Ayurveda, Unani, siddha and homeopathy and Chinese systems
		CO5	Explain about primary metabolites

### III year I semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Medicinal Chemistry II	BP.C311T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Depict synthetic routes of important medicinal agents
		CO2	Interpret the chemistry of drugs with pharmacological activity

		CO3	Describe the structure activity relationship and different classes of drugs
		CO4	Differentiate the metabolic Pathways and therapeutic value of drugs
		CO5	Integrate various classes of drugs molecules
Industrial Pharmacy - I	BP.C312T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Demonstrate the various Pre-formulation parameters for Formulation development
		CO2	Compare the various pharmaceutical dosage forms and their manufacturing techniques
		CO3	Discriminate various considerations in development of pharmaceutical dosage forms
		CO4	Formulate solid, liquid, liquid orals and sterile dosage forms
		CO5	Evaluate various dosage forms like solid, liquid, liquid orals, sterile products and packaging materials
Pharmacology II	BP.C313T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain the mechanism of drug action and its reference in treatment of different diseases
		CO2	Demonstrate the isolation of different organs/tissues from the laboratory animals by simulated experiments
		CO3	Demonstrate the various receptor action using isolated tissue preparation
		CO4	Describe the pharmacological aspects of drugs' importance of pharmacology subject as a basis of therapeutics and correlate the knowledge therapeutically
		CO5	Describe the patho-physiology of selected disease states and the rationale for drug therapy and the therapeutic approach to management of these diseases
Pharmacognosy and Phytochemistry - II	BP.C314T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Analyze the importance of various biosynthetic techniques and importance of their pathways of various constituents

		CO2	Categorize various phytochemical based on their chemistry and chemical groups
		CO3	Identify various types of metabolites (primary and secondary by the schematic study)
		CO4	Distinguish the difference between various isolations, extractions and various process used for isolations
		CO5	Distinguish various production methods of herbals and relate their utilization in various industries
Generic Product Development (Open Elective -I)	BP.C315T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Apply the Generic Drug Product approval process in India and US and Hatch-Waxman Act
		CO2	Design the Generic products, formula and process optimization
		CO3	Evaluate the analytical method validation for API, In-process samples and finished dosage forms
		CO4	Estimate the degradation products of API and finished dosage forms, expiry date
		CO5	Perform the bio-equivalence studies, e-CTD and product approval process
Cosmetic science (Open Elective -I)	BP.C318T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Identify the cosmetic products and cosmetic excipients
		CO2	Describe skincare and oral care, hair care products, and their method of preparation
		CO3	Illustrate the regulations about cosmetics and their excipients
		CO4	Explain the role of herbs in sunscreens and evaluation procedures
		CO5	Describe the creams, antiperspirants, deodorants, and hair care products. Describe alopecia and acne.

### III year II semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Medicinal Chemistry - III	BP.C321T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Analyze the concept of Computer Aided Drug Discovery
		CO2	Assess structural activity relationship of drugs of therapeutic interest
		CO3	Interpret the chemistry of drugs with respect to their biological activity
		CO4	Design and synthesis of various intermediates and medicinally important compounds
		CO5	Interpret the metabolism, adverse effects and therapeutic value of drugs
Pharmacology - III	BP.C322T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Compare and contrast the drugs falling under each drug category of Respiratory system and GIT
		CO2	Explain about the pharmacological aspect of different chemotherapeutic drugs
		CO3	Explain about the pharmacological aspect of different Immuno-stimulants, suppressants and other drugs
		CO4	Apply the knowledge of drugs therapeutically in clinical case scenario
		CO5	Apply the knowledge of drugs in treating different types of poisoning
Herbal Drug Technology	BP.C323T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe herbs as raw materials, herbal medicine, and drugs from cultivation to drug products
		CO2	Discuss the cultivation of medicinal plants, pest management in medicinal plants, and the

			herbal industry
		CO3	Describe nutraceuticals, herbal-drug interactions, cosmetics, excipients, and formulations
		CO4	Explain the process of evaluating drugs, patenting, regulatory requirements of natural products, and regulatory issues
		CO5	Discuss good manufacturing practices, objectives, SOP documentation, infrastructural requirements, and records
Biopharmaceutics and Pharmacokinetics	BP.C324T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the basic concepts of Bio-pharmaceutics and Pharmacokinetics and their application in dosage form formulation and evaluation
		CO2	Calculate Pharmacokinetic parameters (ADME) from the data- Calculation of Half-life, $K_E$ , $K_a$ , $V_d$ etc.
		CO3	Categorize the different factors relating to ADME of drugs
		CO4	Categorize the different compartment models (one, two, multi), Non- compartment, Non Linear pharmacokinetics & derive the equations
		CO5	Calculate Dissolution parameters of drugs & Measurement of Bioavailability, Compare BA, BE of two drug products
Pharmaceutical Quality Assurance (Open Elective -II)	BP.C325T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Illustrate concepts, elements, philosophies, objectives with steps of Quality Assurance/QC/GMP/TQM/Principles and procedures of NABL and ISO 9000
		CO2	Summarize personnel responsibilities, plant layout, maintenance of records, equipment, purchase and store of raw materials
		CO3	Explain the QC test of containers, closures, secondary packaging and practices, its

			requirements
		CO4	Discuss about complaint handling, return of goods and recalling waste, documentation of SOP, audit report, etc
		CO5	Demonstrate principles, procedures of calibration, validation, qualification, good warehousing and material management

IV year I semester			
Course/Subject name	Course Code	Course Outcome number	Course Outcome
Instrumental Methods of Analysis	BP.C411T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Perform qualitative and quantitative analysis of drugs
		CO2	Demonstrate various analytic instruments
		CO3	Handle the analytical instruments
		CO4	Apply instrumental methods for analysis of drugs
		CO5	Summarize the principles of instruments
Industrial Pharmacy-II	BP.C412T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Design the pilot plant and scale-up studies for different types of pharmaceutical dosage forms
		CO2	Perform technology transfer from lab scale to commercial batch
		CO3	Generalize the laws and acts that regulate the pharmaceuticals in India and US

		CO4	Prepare the quality management system (QMS) and certification of ISO 9000 and ISO 14000 series
		CO5	Apply the Drug Approval Process in India and US
Pharmacy Practice	BP.C413T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Illustrate the organization of Hospital, Hospital Pharmacy and Community pharmacy
		CO2	Explain Drug distribution system in Hospital, Therapeutic Drug Monitoring and community pharmacy management
		CO3	Summarize Drug information services, Patient counseling and Educational training programs in Hospital
		CO4	Describe Clinical pharmacy and explain about OTC
		CO5	Explain Drug store management and Inventory control
Novel Drug Delivery System	BP.C414T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain different types of Oral Drug Delivery Systems (ODDS), materials employed and evaluation of ODDS
		CO2	Explain different types of Transdermal Drug Delivery Systems (TDDS), materials employed and evaluation of TDDS
		CO3	Describe mechanism of Bioadhesion, mucoadhesive materials, formulation and development of Mucoadhesive Delivery System
		CO4	Explain formulation, evaluation and applications of Liposomes, Resealed Erythrocytes and Nanoparticles
		CO5	Discuss the principle and fabrication of IUD/injections/implants
Pharmaceutical Regulatory	BP.C416T	<b>Upon completion of the course, student will be able to</b>	



Science (Open Elective -III)		CO1	Describe process of drug discovery
		CO2	Describe process of drug development
		CO3	Choose regulatory authorities (USFDA, Japan, Canada, Europe) governing the manufacture of pharmaceuticals
		CO4	Choose regulatory authorities (USFDA, Japan, Canada, Europe) governing the sale of pharmaceuticals
		CO5	Explain regulatory approval process and registration in Indian and International markets.
Pharmacovigilance (Open Elective -III)	BP.C417T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Relate the importance of pre-clinical drug safety assessments and review current requirements for such testing
		CO2	Summarize the risks and analysis of therapeutic products
		CO3	Evaluate the requirement for post-marketing compliance, Pharmacovigilance activities and their contribution to the safety of a therapeutic product
		CO4	Design activities associated with the role of the Pharmacovigilance specialist within a pharmaceutical company
		CO5	Integrate knowledge, skills and experience of Pharmacovigilance and risk profiles

#### IV year II semester

IV year II semester			
Course/Subject name	Course Code	Course Outcome number	Course Outcome

Biostatistics and Research Methodology	BP.C421T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Evaluate and apply the methods of measuring central tendency, dispersion and correlation
		CO2	Choose a proper method of testing hypothesis to solve statistical problems
		CO3	Evaluate the clinical study designs and prepare the reports in pharmaceutical sciences
		CO4	Apply the knowledge of various graphs and softwares in pharmaceutical sciences and clinical trial phases
		CO5	Design and analysis of various factorial designs and optimization of Response Surface Methodology
Social and Preventive Pharmacy	BP.C422T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Point out various health issues and their challenges
		CO2	Compare various principles of prevention and control of disease
		CO3	Discriminate various National Health Programs
		CO4	Explain the role of the pharmacist in community services
		CO5	Evaluate alternative ways of solving problems related to health and pharmacist issues
Pharmaceutical Jurisprudence	BP.C423T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain various objectives, legal definitions of Schedules to Drugs & Cosmetics Act and rules, import and manufacture of drugs; issue of license
		CO2	Describe sale, labeling and packing of drugs; schedules (G, H, M, N, P, T, U, V, X, Y); Administration of Drugs & Cosmetics Act and rules (DTAB, CDL, DCC,LA, CA, DI, Government drug analyst)
		CO3	Summarize Pharmacy Act 1948, Medicinal & Toilet preparation 1955 and Narcotic Drugs & Psychotropic substances Act 1985 & rules

		CO4	Summarize Drugs & Magic remedies Act and its Rules, Prevention of Cruelty to animals act 1960 and National Pharmaceutical Pricing Authority
		CO5	Interpret Pharmaceutical legislations, Code of Pharmaceutical Ethics, Medical Termination of Pregnancy Act, RTI Act and IPR
Nano Technology (Open Elective -IV)	BP.C425T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Illustrate the definition and history of Nanotechnology, Classify Nano-materials and describe its unique properties
		CO2	Develop the Nano-formulations like Gold, Magnetic, Polymeric Liposomes, Nano-emulsions, etc
		CO3	Find errors in In-vitro diagnostics, imaging and drug targeting
		CO4	Design of pulmonary, nasal, cardiovascular diseases and localized drug delivery system by using Nano-materials
		CO5	Measure the characterization, drug release and stability studies of Nano-materials



# JOGINPALLY B. R. PHARMACY COLLEGE

**PROGRAM: DOCTOR OF PHARMACY (R08)**  
**(Batch 2018 – 2024)**

## COURSE OUTCOMES (COs)

### I year

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Human Anatomy and Physiology	PD.C11T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the structure (gross and histology) and functions of various organs of the human body
		CO2	Describe the various homeostatic mechanisms and their imbalances of various systems
		CO3	Identify the various tissues and organs of the different systems of the human body
		CO4	Illustrate coordinated working pattern of different organs of each system
		CO5	Explain the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body
Pharmaceutics	PD.C12T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Illustrate the history of Profession of pharmacy and Pharmacopoeias
		CO2	Explain different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations

		CO3	Describe the parts of Prescription and handling of prescription
		CO4	Prepare conventional dosage forms according to standard formula of I.P.
		CO5	Explain factors affecting P3osology and pediatric dose calculations. Explain Galenicals, Surgical aids
Medicinal Biochemistry	PD.C13T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Interpret the diagnosed diseases based upon the enzyme deficiencies and analyze the disorder
		CO2	Analyze the metabolic disorders in various disease states
		CO3	Apply the knowledge gained from protein disorder in mutations
		CO4	Reproduce the results from organ function tests & can identify the diseases
		CO5	Perform the qualitative analysis of bio-molecules in body fluids
Pharmaceutical Organic Chemistry	PD.C14T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Predict the name of different functional group of organic compounds
		CO2	Describe the physical properties of compounds
		CO3	Analyze the different chemical aspects and reactions of organic compounds
		CO4	State the medicinal uses and other applications of important named reactions
		CO5	Analyze preparatory methods of medicinally useful organic compounds
Pharmaceutical Inorganic Chemistry	PD.C15T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Analyze the accuracy of results in pharmaceutical analysis
		CO2	Perform different volumetric and gravimetric analytical procedures
		CO3	Apply various analytical principles for limit tests
		CO4	Prepare different inorganic pharmaceuticals as per monograph

		CO5	Differentiate and define individual inorganic pharmaceutical formulations and radio pharmaceuticals
Remedial Mathematics	PD.C16T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Solve the problems of Matrices and Determinants by applying theory.
		CO2	Solve the problems by using the concept of Trigonometry and Geometry.
		CO3	Differentiate the problems by applying Derivatives.
		CO4	Evaluate the Integration problems by applying theory.
		CO5	Choose a proper method to solve the Differential equations and Laplace transforms.

II year			
Course/Subject name	Course Code	Course Outcome number	Course Outcome
Pathophysiology	PD.C21T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the etiology and pathogenesis of the selected disease states
		CO2	Name the signs and symptoms of the diseases
		CO3	State the complications of the diseases
		CO4	Describe the mechanism of the diseases
		CO5	Discuss the etiology and pathogenesis of diseases
Pharmaceutical Microbiology	PD.C22T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the scope of microbiology and role of microorganisms in production of various

			products
		CO2	Choose proper identification tests, methods for cultivation, isolation and preservation of microorganisms
		CO3	Choose proper sterilization and disinfection process and factors affecting it, importance of sterility testing
		CO4	Evaluate the antibiotics and vitamins by microbiological assay
		CO5	Describe the various infectious diseases, etiology, pathogenesis, test, treatment and control, diagnostic tests
Pharmacognosy & Phytopharmaceuticals	PD.C23T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Analyze the importance of alternative system of medicine to Allopathic system of medicine
		CO2	Categorize various techniques in cultivation and explain process of cultivation
		CO3	Identify the sources, constituents, uses and other aspects of crude drugs
		CO4	Distinguish original drug to adulterated/ substituted drugs
		CO5	Identify and relate the individual crude drugs according to their micro and macroscopical characters
Pharmacology-I	PD.C24T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Discuss the pharmacological aspects of drugs falling under various categories
		CO2	Appraise the importance of pharmacology subject as a basis of therapeutics
		CO3	Integrate and apply the knowledge of Pharmacology therapeutically
		CO4	Demonstrate the Pharmacology of drugs acting on various cardio vascular disease, CNS, ANS
		CO5	Illustrate the Pharmacology of Autocoids, Non-steroidal anti-inflammatory agents, anti-

			gout drugs
Community Pharmacy	PD.C25T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Discuss the scope, Roles and responsibilities, code of ethics of community pharmacist and use of essential drug concept, rational drug use of community pharmacist
		CO2	Describe about the community pharmacy management site, layout and management skills required in community pharmacy
		CO3	Explain about prescription and OTC Medications, understand possible drug interactions during dispensing of drugs
		CO4	Illustrate the need of inventory control and understand various methods of inventory control approaches
		CO5	Analyze pharmaceutical care, various health screening services, Responding to symptoms of minor ailments, patient counselling and patient medication adherence
Pharmacotherapeutics-I	PD.C26T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe pathophysiology of selected diseases
		CO2	Prepare the individual therapeutic plan
		CO3	Discuss therapeutic approach to management of diseases
		CO4	Prepare factors regarding non-pharmacological approaches
		CO5	Evaluate the patient specific parameters relevant in initiation of drug therapy

### III year

Course/Subject name	Course	Course	Course Outcome
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	<b>Code</b>	<b>Outcome number</b>	
Pharmacology-II	PD.C31T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain and contrast the drugs falling under each category
		CO2	Explain about the pharmacological aspect of different drugs under each category
		CO3	Apply the knowledge of drugs therapeutically in Clinical case scenario
		CO4	Explain and summarize various concepts pertaining to genes and Cells
		CO5	Apply the knowledge of drugs practically and predict the effects of drugs and principles of Bioassay
Pharmaceutical Analysis	PD.C32T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Identify and analyze the sources of quality variations and prepare different documents for quality review
		CO2	Demonstrate various chromatographic techniques and apply principles of chromatography for separation
		CO3	Perform various electrochemical methods and apply principles of electro chemical methods in Pharma industry
		CO4	Apply principles of spectroscopy for qualitative and quantitative analysis
		CO5	Interpret the result of different spectroscopic methods
Pharmacotherapeutics-II	PD.C33T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe pathophysiology of selected diseases
		CO2	Prepare the individual therapeutic plan
		CO3	Discuss therapeutic approach to management of diseases

		CO4	Prepare factors regarding non-pharmacological approaches
		CO5	Evaluate the patient specific parameters relevant in initiation of drug therapy
Pharmaceutical Jurisprudence	PD.C34T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Examine the Pharmaceutical Legislation and code of Pharmaceutical Ethics drafted by PCI
		CO2	Compare the various objectives and legal definitions of Drugs & Cosmetics Act 1940, Pharmacy Act-1948, Medicinal and Toilet preparations Act-1955, Narcotic and Psychotropic substance Act-1985
		CO3	Discriminate various parameters in Drugs & Cosmetics Act 1940, Pharmacy Act-1948, Medicinal and Toilet preparations Act-1955, Narcotic and Psychotropic substance Act-1985
		CO4	Associate the Drugs and Magic Remedies Act, DPCO, National drug policy, Prevention of cruelty to animals Act-1960, Patents & Design Act-1970
		CO5	Compare various Prescription and Non-prescription products
Medicinal Chemistry	PD.C35T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain the importance of drug design and different techniques of drug design.
		CO2	Analyze various heterocyclic which can be used as pharmacologic groups
		CO3	Discuss regarding different drugs to be synthesized which are active.
		CO4	Evaluate & analyze various drugs for adverse effects & measures to reduce toxicity profile of a drug.
		CO5	Describe metabolism of different drugs & design novel drugs.
Pharmaceutical Formulations	PD.C36T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Define various pharmaceutical dosage forms based on their classification along with their

			advantages and disadvantages
		CO2	Formulate dosage forms for eyes, body, skin with fundamentals of pharmaceutical science
		CO3	Select suitable equipment for manufacturing of dosage forms in small and large scale and storage conditions for stability of dosage forms
		CO4	Evaluate Tablets, Capsules, liquid orals, semisolid and parenteral preparations as per standard Pharmacopoeias
		CO5	Describe the concept of Novel drug delivery systems along with their requirements for formulation and evaluation

IV year			
Course/Subject name	Course Code	Course Outcome number	Course Outcome
Pharmacotherapeutics-III	PD.C41T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe pathophysiology of selected diseases
		CO2	Prepare the individual therapeutic plan
		CO3	Discuss therapeutic approach to management of diseases
		CO4	Prepare factors regarding non-pharmacological approaches
		CO5	Evaluate the patient specific parameters relevant in initiation of drug therapy
Hospital Pharmacy	PD.C42T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe roles and responsibilities of Hospital pharmacist, drug policies and guidelines for

			Hospital pharmacy
		CO2	Describe organizational structure of Hospital pharmacy and to manage material and budget
		CO3	Describe drug policy and drug committee
		CO4	Design parenteral formulations and powders
		CO5	Prepare a News-letter for providing continuous education and awareness
Clinical Pharmacy	PD.C43T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Evaluate drug therapy, ADR and laboratory data
		CO2	Describe the services provided by a clinical pharmacist
		CO3	Assess drug related problems
		CO4	Design protocols to maintain standards in drug therapy and to avoid medication errors
		CO5	Support clinicians by providing drug and poison information
Biostatistics & Research Methodology	PD.C44T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Design the research methods and experimental design in clinical studies
		CO2	Evaluate and apply the methods of measuring central tendency and spread of data
		CO3	Evaluate the clinical study designs and prepare the reports in pharmaceutical sciences
		CO4	Choose proper method of testing hypothesis for determining the given data
		CO5	Apply the knowledge of various graphs and softwares in pharmaceutical sciences
Biopharmaceutics & Pharmacokinetics	PD.C45T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the basic concepts of Biopharmaceutics and Pharmacokinetics and their application in dosage form formulation and evaluation
		CO2	Calculate Pharmacokinetic parameters (ADME) from the data- Calculation of Half-life, $K_E$ , $K_a$ , $V_d$ , etc

		CO3	Categorize the different factors relating to ADME of drugs, different compartment models & derive equations
		CO4	Calculate Dissolution parameters of drugs & Measurement of Bioavailability
		CO5	Classify BCS drugs & Compare BA, BE of drugs
Clinical Toxicology	PD.C46T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the general principles involved and devise healthcare professionals in the management of poisoning
		CO2	Differentiate the clinical symptoms and explain the management of different acute poisonings
		CO3	Distinguish the clinical symptoms and explain the management of different chronic poisoning by heavy metals
		CO4	Recognize the clinical symptoms and management of envenomation, food poisoning and poisoning by various plants
		CO5	Evaluate, minimize and prevent the substance abuse cases in local population and devise the treatment of dependence

V year			
Course/Subject name	Course Code	Course Outcome number	Course Outcome
Clinical Research	PD.C51T	<b>Upon completion of the course, student will be able to</b>	

		CO1	Illustrate the Drug development process and various approaches to drug discovery
		CO2	Explain different phases of Clinical trials, roles and responsibilities of personnel involved in Clinical trials
		CO3	Explain different guidelines (ICH, GCP, CDSCO) and challenges in implementing them
		CO4	Distinguish various regulatory submissions in India, US, Europe
		CO5	List out documentation (Informed consent), data management and safety monitoring in clinical trials
Pharmacoepidemiology and Pharmacoeconomics	PD.C52T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Discuss the scope and measurement of outcomes in Pharmacoepidemiology
		CO2	Measure the concept of risk in Pharmacoepidemiology
		CO3	Classify methods of Pharmacoepidemiology and sources of data for its studies
		CO4	Explain selected special applications of Pharmacoepidemiology
		CO5	Discuss the history and applications of Pharmacoeconomics and explain the methods used in Pharmacoeconomics
Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	PD.C53T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain the basic concepts in biopharmaceutics and pharmacokinetics and their significance
		CO2	Explain the use of plasma drug concentration-time data to calculate the pharmacokinetic parameters
		CO3	Summarize the concepts of bioavailability and bioequivalence of drug products and their significance
		CO4	Discuss various pharmacokinetic parameters, their significance & applications

		CO5	Demonstrate clear information on compartmental models and methods to assess the models and describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
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# JOGINPALLY B. R. PHARMACY COLLEGE

PROGRAM: M PHARMACY (R22)

PHARMACEUTICS/PHARMACEUTICAL TECHNOLOGY

(Batch 2022-2024)

## COURSE OUTCOMES (COs)

### I year I Semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Modern Pharmaceutics – I (Professional Core – I)	M.PT.C111T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the goals of Preformulation, its parameters, different forms of drugs and selection of drugs
		CO2	Categorize different excipients used in development of Solid dosage forms
		CO3	Compare different Coating techniques and explain about Micro-encapsulation
		CO4	Discuss formulation development of Capsules
		CO5	Choose the optimization techniques in pharmaceutical formulation and process
Applied Biopharmaceutics and Pharmacokinetics (Professional Core – II)	M.PT.C112T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Summarize the various biological and metabolic factors affecting bioavailability and explain the methods of assessment of biological samples to determine bioavailability
		CO2	Determine various pharmacokinetic parameters by using different compartment models
		CO3	Calculate rate of absorption for different kinetic orders



		CO4	Explain the concept of Non-linear and Clinical pharmacokinetics
		CO5	Analyze Time dependent pharmacokinetics and various Drug interactions
Drug Regulatory Affairs (Professional Elective – I)	M.PT.C114T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain different competent Regulatory Authorities globally
		CO2	Apply technical aspects pertaining to the marketing authorization application
		CO3	Compare regulatory guidelines by various regulatory bodies
		CO4	Apply suitable regulatory guidelines for best fit of drug into market
		CO5	Discuss about the records related to pharmaceutical industry departments
Stability of Drugs and Dosage Forms (Professional Elective – II)	M.PT.C118T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe Hydrolysis and Acyltransferase: nature of reaction, structure and utility, and stabilization of pharmaceuticals with examples
		CO2	Discuss the kinetics of solid-state decomposition
		CO3	Describe the identification and quantitative determination of various excipients and factors affecting extraction of drugs
		CO4	Explain general methods of analysis to determine the quality of raw materials used in cosmetic industry
		CO5	Discuss methods of analysis to determine the quality of cosmetics in the finished forms
Research Methodology and IPR	M.PT.C119T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Summarize Research problem and sources of research problem
		CO2	Compare different literature studies approaches and analyze Plagiarism and research ethics
		CO3	Infer effective technical writing and write report

		CO4	Discuss about Patents, Designs, Trade and Copyrights
		CO5	Analyze licensing and technology transfer

I year II Semester			
Course/Subject name	Course Code	Course Outcome number	Course Outcome
Modern Pharmaceutics – II (Professional Core – III)	M.PT.C121T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe the pilot plant and its scale up techniques used in manufacturing of various pharmaceuticals
		CO2	Discuss the formulation development of Parenteral dosage forms
		CO3	Explain the manufacturing process of Aerosols
		CO4	Describe the manufacturing process of Cosmetics and Nutraceuticals
		CO5	Analyze the Aseptic processing operation
Advanced Drug Delivery Systems (Professional Core – IV)	M.PT.C122T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain about Controlled release oral drug delivery systems and Parenteral controlled release drug delivery systems
		CO2	Discuss about Implantable therapeutic systems, Transdermal delivery systems, Ocular, Intrauterine delivery systems and Vaccine delivery
		CO3	Summarize Bioadhesive drug delivery systems, Nasal drug delivery systems and Drug delivery to colon
		CO4	Describe: Liposomes, Niosomes, Microspheres, Nanoparticles and Resealed

			Erythrocytes
		CO5	Distinguish Drug delivery to Lungs, Brain and targeting Neoplasms
Industrial Pharmacy (Professional Elective – III)	M.PT.C123T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Describe machinery and the theory of pharmaceutical unit operations
		CO2	Discuss principles and production techniques in the large-scale production of various dosage forms
		CO3	Describe the Good Manufacturing Practices (GMP) and Total Quality Management (TQM)
		CO4	Explain the process of effluent analysis, specifications and preventive measures for water, solid, air and sound pollution
		CO5	Discuss regulatory basis, validation process for solid dosage forms, sterile products and liquid dosage forms
Nano based Drug Delivery Systems (Professional Elective – IV)	M.PT.C126T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain Nanotechnology. Determine and classify various properties of nanomaterials
		CO2	Summarize various physical, chemical and biological methods for synthesis of nanoparticles (gold, magnetic, polymeric, self-assembly structures)
		CO3	Elaborate about different biomedical applications of nanotechnology
		CO4	Design nanomaterials for different drug delivery (nasal, pulmonary, cancer therapy, cardiovascular diseases, localized drug delivery)
		CO5	Explain different methods of size reduction, size separation and analysis of nanoparticles

## II year I Semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Production area, Design and Packaging Development (Professional Elective – V)	M.PT.C213T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Illustrate Production Area Design and General utilities in production area
		CO2	Explain cGMP used in pharmaceutical industry and its documentation
		CO3	Describe pharmaceutical packaging, components of packaging, label, design research, package development and materials used in packaging
		CO4	Discuss Stability of packaging (Legislation, Regulation and Testing conditions)
		CO5	Differentiate between packaging of solids, semisolids, parenterals, ophthalmics and aerosols
Cosmetic Science (Open Elective)	M.PT.C2111T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Classify Cosmetics, Cosmeceutical products and excipients used in it
		CO2	Explain principles of formulation of skin care, hair care and oral care products
		CO3	Classify sunscreens; Explain SPF, role of herbs used in cosmetics and analysis of cosmetics
		CO4	Explain principles of cosmetic evaluation
		CO5	Describe various cosmetic problems associated with hair, scalp and skin



# JOGINPALLY B. R. PHARMACY COLLEGE

**PROGRAM: M PHARMACY (R22)**

**PHARMACEUTICAL ANALYSIS**

**(Batch 2022-2024)**

## COURSE OUTCOMES (COs)

### I year I Semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Modern Pharmaceutical Analytical Techniques (Professional Core – I)	M.PA.C111T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Predict the names of different functional groups of organic compounds from Spectra
		CO2	Describe the chromatographic separation and analysis of drugs
		CO3	Analyze the quantitative and qualitative analysis of drugs by using different analytical instruments
		CO4	Analyze various spectral aspects of GC, HPLC, HPTLC, UV-Visible, IR Spectroscopy, Mass and NMR, etc
		CO5	Interpret the spectra and illustrate the structure of different compounds
Pharmaceutical Food Analysis (Professional Core – II)	M.PA.C112T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Analyze food constituents by different analytical techniques
		CO2	Prepare different finished food products using different food constituents

		CO3	Perform various instrumental methods for identification of pesticides in food products
		CO4	Demonstrate different food regulations and legislations
		CO5	Choose suitable additives for preparation of food products
Drug Regulatory Affairs (Professional Elective – I)	M.PA.C114T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain different competent Regulatory authorities globally
		CO2	Apply technical aspects pertaining to the marketing authorization application
		CO3	Compare regulatory guidelines by various regulatory bodies
		CO4	Apply suitable regulatory guidelines for best fit of drug into market
		CO5	Discuss about the records related to pharmaceutical industry departments
Pharmaceutical Validation (Professional Elective – II)	M.PA.C116T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Explain different types of Validation and its application to various instruments at different stages of usage
		CO2	Describe procedure involved in qualification of various analytical instruments and glassware
		CO3	Assess the steps involved in qualification of laboratory equipment and validation of utility systems
		CO4	Discuss validation of analytical method used for cleaning equipment
		CO5	Apply the knowledge of validation of analytical methods as per ICH guidelines and USP
Research Methodology and IPR	M.PA.C119T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Summarize Research problem and sources of research problem
		CO2	Compare different literature studies approaches and analyze Plagiarism and research

			ethics
		CO3	Infer effective technical writing, write report and develop research proposal
		CO4	Discuss about various Intellectual property: Patents, Designs, Trade and Copyrights
		CO5	Analyze Patent rights: licensing and technology transfer

<b>I year II Semester</b>			
<b>Course/Subject name</b>	<b>Course Code</b>	<b>Course Outcome number</b>	<b>Course Outcome</b>
Advanced Instrumental Analysis - I (Professional Core – III)	M.PA.C121T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Predict different analytical data from different instruments (LC-MS, GC-MS, SEM, DSC, etc)
		CO2	Describe the operational parameters for each analytical instrument
		CO3	Interpret the spectra and illustrate the structure of different compounds
		CO4	Analyze various spectral aspects of X-Ray, IR, SEM, ORD, etc
		CO5	Describe the techniques for recording and evaluating analytical data derived from different analytical instruments and solve a variety of numerical problems dealing with analysis of samples
Pharmaceutical Quality Control and Quality Assurance (Professional Core – IV)	M.PA.C122T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Analyze pharmaceutical samples in pharmaceutical industries
		CO2	Develop and formulate high quality pharmaceutical products
		CO3	Prepare documentation in Quality Assurance laboratory

		CO4	Differentiate cGMP and Quality Control tests
		CO5	Differentiate GLP and Regulatory Affairs guidelines
Modern Bio-analytical Techniques (Professional Elective – III)	M.PA.C123T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Analyze the extraction techniques of drugs from biological samples
		CO2	Evaluate different techniques for the separation of drugs
		CO3	Prepare the guidelines for bio-equivalent and bio-analytical principles
		CO4	Apply compatibility studies for different drug analysis methods
		CO5	Apply the concepts of bio-samplers using automated systems
Advanced Instrumental Analysis – II (Professional Elective – IV)	M.PA.C126T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Perform different electrochemical methods for the analysis of pharmaceuticals
		CO2	Apply the principles of fluorimetry for the qualitative analysis of different compounds
		CO3	Apply the principles of absorption and emission spectroscopy as per the analysis
		CO4	Demonstrate the principles and applications of radio chemical methods in pharmaceutical analysis
		CO5	Explain about ELISA and its applications

### II year I Semester

Course/Subject name	Course Code	Course Outcome number	Course Outcome
Scale up and Technology	M.PA.C212T	<b>Upon completion of the course, student will be able to</b>	



Transfer (Professional Elective – V)		CO1	Manage the scale up process in pharmaceutical industry
		CO2	Assist in Technology transfer
		CO3	Establish safety guidelines, which prevent industrial hazards
		CO4	Explain process validation and equipment qualification
		CO5	Explain analytical method validation parameters
Cosmetic Science (Open Elective)	M.PA.C2111T	<b>Upon completion of the course, student will be able to</b>	
		CO1	Classify Cosmetics, Cosmeceutical products and excipients used in it
		CO2	Explain principles of formulation of skin care, hair care and oral care products
		CO3	Classify sunscreens; Explain SPF, role of herbs used in cosmetics and analysis of cosmetics
		CO4	Explain principles of cosmetic evaluation
		CO5	Describe various cosmetic problems associated with hair, scalp and skin