



# ARYA College of Pharmacy

(Affiliated to RUHS, Jaipur • Approved by PCI, AICTE, New Delhi)

• S.P.- 40, Kukas Industrial Area (RIICO) Jaipur - 302028

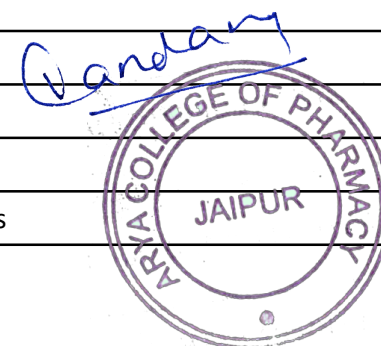
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• Website : [www.aryapharmacyjpr.com](http://www.aryapharmacyjpr.com)

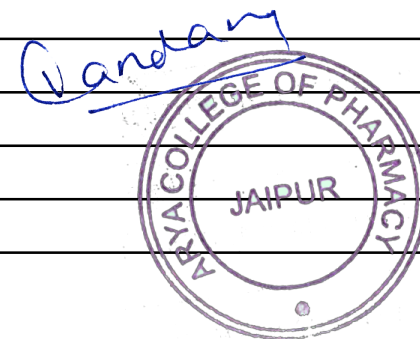
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## B.PHARMA I Semester

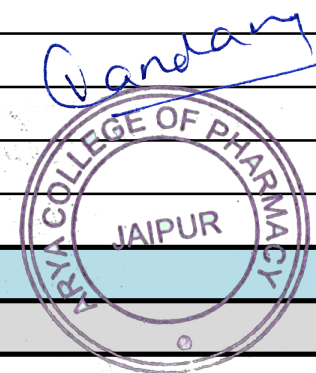
COURSE CODE/COURSE TITLE		COURSE OUTCOME
BP101T. HUMAN ANATOMY AND PHYSIOLOGY-I	CO1	Explain the gross morphology, structure and functions of various organs of the human Body
	CO2	Describe the various homeostatic mechanisms and their imbalances.
	CO3	Identify the various tissues and organs of different systems of human body.
	CO4	Perform the various haematological experiments like CT,BT,CBC,TLC etc.
	CO5	Appreciate coordinated working pattern of different organs of each system
BP102T. PHARMACEUTICAL ANALYSIS	CO1	understand the principles of volumetric and electro chemical analysis
	CO2	carryout various volumetric and electrochemical titrations
	CO3	develop analytical skills
	CO4	Explain definitions, preparation and assay method of acid and base
BP103T. PHARMACEUTICS- I	CO1	Know the history of profession of pharmacy
	CO2	Understand the basics of different dosage forms
	CO3	Understand pharmaceutical incompatibilities and pharmaceutical calculations
	CO4	Understand the professional way of handling the prescription
	CO5	Preparation of various conventional dosage forms
BP104T. PHARMACEUTICAL INORGANIC CHEMISTRY	CO1	Know the sources of impurities and methods to determine the impurities in API's
	CO2	Understand the medicinal and pharmaceutical importance of inorganic compounds
	CO3	Describe the definitions, preparations of buffers and adjustments of isotonicity
	CO4	know the sources, Properties and uses of Gastrointestinal agents
	CO5	Acquire knowledge on different types of medical gases, anesthetics and respiratory stimulants



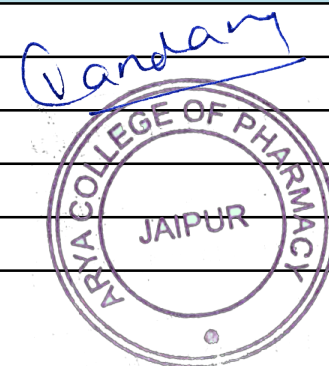
<b>BP105T.COMMUNICATION SKILLS</b>	CO1	Understand the behavioral needs for a Pharmacist to function effectively in the Pharmaceutical field
	CO2	Communicate effectively (Verbal and Non Verbal)
	CO3	Effectively manage the team as a team player
	CO4	Develop interview skills
	CO5	Develop Leadership qualities and essentials
<b>BP 106RBT.REMEDIAL BIOLOGY</b>	CO1	know the classification and salient features of five kingdoms of life
	CO2	understand the basic components of anatomy & physiology of plant
	CO3	know the basic components of anatomy & physiology of animals Specially Human
	CO4	understand the basics of plant growth and development
	CO5	understand Morphological basics of plant Parts
<b>BP 106RMT.REMEDIAL MATHEMATICS</b>	CO1	Know the theory and their application in Pharmacy
	CO2	Solve the different types of problems by applying theory
	CO3	Appreciate the important application of mathematics in Pharmacy
	CO4	Understand meaning of statistics, uses and limitation and Testing of Hypothesis.
	CO5	Apply both conventional and creative techniques to the solutions of mathematical problems
<b>B.PHARMA II Semester</b>		
<b>COURSE CODE/COURSE TITLE</b>		<b>COURSE OUTCOME</b>
<b>BP 201T. HUMAN ANATOMY AND PHYSIOLOGY-II</b>	CO1	Explain the gross morphology, structure and functions of various organs of the Human body
	CO2	Describe interlinked mechanism in the maintenance of homeostatic mechanisms and their imbalances
	CO3	Identify the organs of different systems of human body.
	CO4	Perform the various experiments related to special senses and nervous system
	CO5	Appreciate coordinated working pattern of different organs of each system
<b>BP202T. PHARMACEUTICAL ORGANIC CHEMISTRY –I</b>	CO1	write the structure, name and the type of isomerism of the organic compound
	CO2	write the reaction, name the reaction and orientation of reactions
	CO3	account for reactivity/stability of compounds



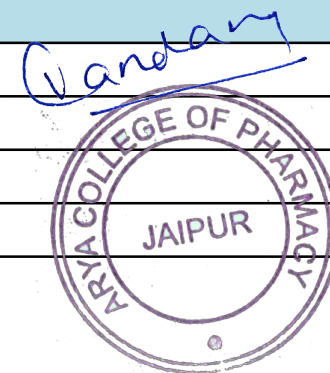
	CO4	identify/confirm the identification of organic compound
	CO5	write the examples and differences of reactions
<b>BP203 T. BIOCHEMISTRY</b>	CO1	understand the molecular levels of the chemical process associated with living cells.
	CO2	Understand the metabolism of nutrient molecules in physiological and pathological conditions
	CO3	Understand the genetic organization of mammalian genome and functions of DNA in RNA and protein synthesis
	CO4	Understand the catalytic role, importance and applications of enzyme in drug design
	CO5	understand Concept of free energy, endergonic and exergonic reaction with significance of Energy molecules
<b>BP 204T.PATHOPHYSIOLOGY</b>	CO1	understand thorough knowledge of the relevant aspects of pathology of various conditions
	CO2	Describe the etiology and pathogenesis of the selected disease states;
	CO3	Name the signs and symptoms of the diseases
	CO4	Mention the complications of the diseases.
	CO5	practice medicine safely, confidently, rationally and effectively.
<b>BP205 T. COMPUTER APPLICATIONS IN PHARMACY</b>	CO1	deals with the introduction Database, Database Management system
	CO2	know the various types of application of computers in pharmacy
	CO3	know the various types of databases
	CO4	know the various applications of databases in pharmacy
	CO5	know use of database and computer in clinical studies
<b>BP 206 T. ENVIRONMENTAL SCIENCES</b>	CO1	Create the awareness about environmental problems among learners.
	CO2	Impart basic knowledge about the environment and its allied problems.
	CO3	Develop an attitude of concern for the environment
	CO4	Motivate learner to participate in environment protection and environment improvement.
	CO5	Strive to attain harmony with Nature.
<b>B.PHARMA III Semester</b>		
<b>COURSE CODE/COURSE TITLE</b>		<b>COURSE OUTCOME</b>
	CO1	deals with general methods of preparation and reactions and Reactivity of organic compounds



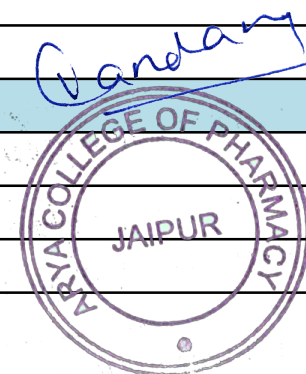
<b>BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II</b>	CO2	write the structure, name and the type of isomerism of the organic compound
	CO3	write the reaction, name the reaction and orientation of reactions
	CO4	account for reactivity/stability of compounds
	CO5	prepare organic compounds
<b>BP302T. PHYSICAL PHARMACEUTICS-I</b>	CO1	know solubility principles and patterns of drug molecules
	CO2	know various physicochemical properties, and principles involved in dosage forms/formulations.
	CO3	Know the principles of chemical kinetics & to use them for stability testing
	CO4	know classification and application of complexation with special reference to protein binding
	CO5	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
<b>BP 303 T. PHARMACEUTICAL MICROBIOLOGY</b>	CO1	Understand methods of identification, cultivation and preservation of various microorganisms
	CO2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry
	CO3	Learn sterility testing of pharmaceutical products.
	CO4	Carried out microbiological standardization of Pharmaceuticals.
	CO5	Understand the cell culture technology and its applications in pharmaceutical industries
<b>BP 304 T. PHARMACEUTICAL ENGINEERING</b>	CO1	To know various unit operations used in Pharmaceutical industries.
	CO2	To understand the material handling techniques.
	CO3	To perform various processes involved in pharmaceutical manufacturing process.
	CO4	To carry out various test to prevent environmental pollution.
	CO5	To appreciate and comprehend significance of plant lay out design for optimum use of resources.
<b>B.PHARMA IV Semester</b>		
<b>BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III</b>	CO1	understand stereo-chemical aspects of organic compounds and stereo chemical reactions
	CO2	understand the methods of preparation and properties of organic compounds
	CO3	know the medicinal uses and other applications of organic compounds
	CO4	know the chemistry, medicinal uses of important hetero cyclic compounds
	CO5	understand stereo-chemical aspects of important named reactions



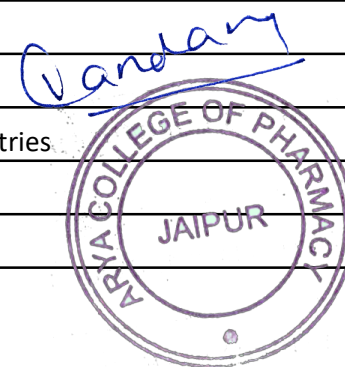
<b>BP402T. MEDICINAL CHEMISTRY – I</b>	CO1	understand the chemistry of drugs with respect to their pharmacological activity
	CO2	understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	know the Structural Activity Relationship (SAR) of different class of drugs
	CO4	write the chemical synthesis of some drugs
	CO5	design fundamental structure and explain chemistry and therapeutic value of drugs.
<b>BP 403 T. PHYSICAL PHARMACEUTICS-II</b>	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms
	CO2	Know the principles involved and used for stability testing for determination of expiry date of formulations
	CO3	know use of physicochemical properties in the formulation development and evaluation of dosage forms
	CO4	Know how physicochemical properties of drug molecules affect stability testing
	CO5	Get a better insight into various areas of formulation research and development,
<b>BP 404 T. PHARMACOLOGY-I</b>	CO1	Understand the pharmacological actions of different categories of drugs
	CO2	Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
	CO3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
	CO4	Observe the effect of drugs on animals by simulated experiments
	CO5	Appreciate correlation of pharmacology with other bio medical sciences
<b>BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I</b>	CO1	know the techniques in the cultivation and production of crude drugs
	CO2	know the crude drugs, their uses and chemical nature
	CO3	know the evaluation techniques for the herbal drugs
	CO4	carry out the microscopic and morphological evaluation of crude drugs
	CO5	know chemical nature and uses of drugs of natural origin like plant metabolites, enzymes etc.
<b>B.PHARMA V Semester</b>		
<b>BP501T. MEDICINAL CHEMISTRY – II</b>	CO1	Understand the chemistry of drugs with respect to their pharmacological activity
	CO2	Understand the drug metabolism and metabolic pathways of drugs
	CO3	Know the Structural Activity Relationship of different class of drugs
	CO4	Study the chemical synthesis of selected drugs



	CO5	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
<b>BP 502 T. Industrial PharmacyI</b>	CO1	Know the various pharmaceutical dosage forms and their manufacturing techniques.
	CO2	Know various considerations in development of pharmaceutical dosage forms
	CO3	Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality
	CO4	know the influence of pharmaceutical additives on the performance of the drug product.
	CO5	manufacturing techniques, development and evaluation of cosmetics
<b>BP503.T. PHARMACOLOGY-II</b>	CO1	Understand the mechanism of drug action and its relevance in the treatment of different diseases
	CO2	Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
	CO3	Demonstrate the various receptor actions using isolated tissue preparation
	CO4	Appreciate correlation of pharmacology with related medical sciences
	CO5	understand the basic concepts and methods of bioassay of various drugs
<b>BP504 T. PHARMACOGNOSY AND PHYTOCHEMISTRY II</b>	CO1	know production, isolation, identification and uses of secondary metabolites
	CO2	understand the herbal drug interactions
	CO3	know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
	CO4	carryout isolation and identification of phytoconstituents through plant tissue culture
	CO5	basic principles of traditional system of medicine
<b>BP 505 T. PHARMACEUTICAL JURISPRUDENCE</b>	CO1	The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals
	CO2	Various Indian pharmaceutical Acts and Laws
	CO3	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
	CO4	The code of ethics during the pharmaceutical practice
	CO5	Know various other legislative laws acting and regulating pharmaceutical industry
<b>B.PHARMA VI Semester</b>		
<b>BP601T. MEDICINAL CHEMISTRY – III</b>	CO1	Understand the importance of drug design and different techniques of drug design.
	CO2	Understand the chemistry of drugs with respect to their biological activity.
	CO3	Know the metabolism, adverse effects and therapeutic value of drugs.

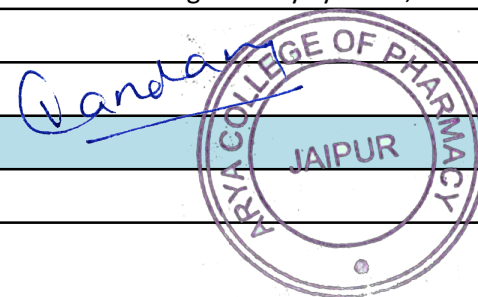


	CO4	Know the importance of SAR of drugs.
	CO5	know Various approaches used in drug design, Pharmacophore modeling and docking techniques, combinatorial chemistry
<b>BP602 T. PHARMACOLOGY-III</b>	CO1	understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
	CO2	comprehend the principles of toxicology and treatment of various poisonings
	CO3	understand various aspects of Chemotherapy
	CO4	know basic clinical oncepts and significance leading to chronotherapy
	CO5	appreciate correlation of pharmacology with related medical sciences
<b>BP 603 T. HERBAL DRUG TECHNOLOGY</b>	CO1	understand herbal drugs and Herbal drug industry
	CO2	understand raw material as source of herbal drugs from cultivation to herbal drug product
	CO3	know the WHO and ICH guidelines for evaluation of herbal drugs
	CO4	know the herbal cosmetics, natural sweeteners, nutraceuticals
	CO5	appreciate patenting of herbal drugs, GMP
<b>BP 604 T. BIOPHARMACEUTICS AND PHARMACOKINETICS</b>	CO1	Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance
	CO2	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters
	CO3	to describe the kinetics of drug absorption, distribution,metabolism, excretion, elimination
	CO4	To understand the concepts of bioavailability and bioequivalence of drug products and their significance
	CO5	Understand various pharmacokinetic parameters, their significance & applications.
<b>BP 605 T. PHARMACEUTICAL BIOTECHNOLOGY</b>	CO1	understand Biotechnology with reference to Pharmaceutical Sciences
	CO2	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
	CO3	Genetic engineering applications in relation to production of pharmaceuticals
	CO4	Importance of Monoclonal antibodies in Industries
	CO5	Appreciate the use of microorganisms in fermentation technology
<b>BP606TPHARMACEUTICAL QUALITY ASSURANCE</b>	CO1	know various aspects of quality control and quality assurance aspects of pharmaceutical industries
	CO2	understand the cGMP aspects in a pharmaceutical industry
	CO3	appreciate the importance of documentation



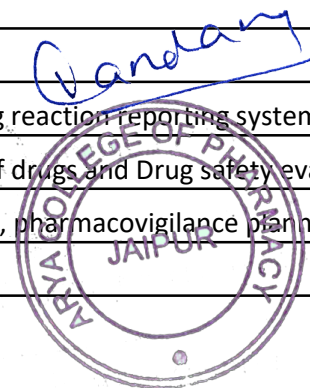


	CO4	understand the scope of quality certifications applicable to pharmaceutical industries
	CO5	understand the responsibilities of QA & QC departments
<b>B.PHARMA VII Semester</b>		
<b>BP701T. INSTRUMENTAL METHODS OF ANALYSIS</b>	CO1	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
	CO2	know the application of instrumental methods in qualitative and quantitative analysis of drugs
	CO3	Understand the principles and instrumentation of chromatographic separation and analysis of drugs.
	CO4	Understand the principles and instrumentation of spectroscopic separation and analysis of drugs.
	CO5	Perform quantitative & qualitative analysis of drugs using various analytical instruments
<b>BP 702 T. INDUSTRIAL PHARMACYII</b>	CO1	know fundamental knowledge on pharmaceutical product development and translation from laboratory to market
	CO2	Know the process of pilot plant and scale up of pharmaceutical dosage forms
	CO3	Understand the process of technology transfer from lab scale to commercial batch
	CO4	Know different Laws and Acts that regulate pharmaceutical industry
	CO5	Understand the approval process and regulatory requirements for drug products
<b>BP 703T. PHARMACY PRACTICE</b>	CO1	know various drug distribution methods in a hospital
	CO2	appreciate the pharmacy stores management and inventory control
	CO3	monitor drug therapy of patient through medication chart review
	CO4	detect and assess adverse drug reactions
	CO5	know pharmaceutical care services and appreciate the concept of Rational drug therapy
<b>BP 704T: NOVEL DRUG DELIVERY SYSTEMS</b>	CO1	know basic knowledge in the area of novel drug delivery systems.
	CO2	To understand various approaches for development of novel drug delivery systems
	CO3	To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems,
	CO4	know formulation and evaluation of Novel drug delivery systems
	CO5	know advantages and disadvantages of Novel drug delivery systems
<b>B.PHARMA VIII Semester</b>		
	CO1	understand applications of Biostatics in Pharmacy

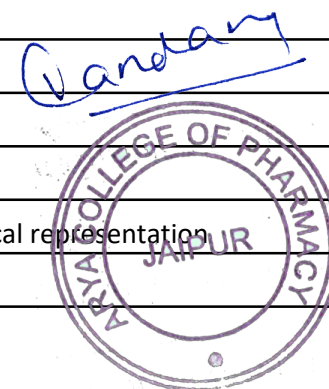




<b>BP801T. BIOSTATISTICS AND RESEARCH METHODOLOGY</b>	CO2	Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment)
	CO3	Know the various statistical techniques to solve statistical problems
	CO4	Appreciate statistical techniques in solving the problems.
	CO5	Introduction to Design of Experiments, Phases of Clinical trials and Observational and Experimental studies.
<b>BP 802T SOCIAL AND PREVENTIVE PHARMACY</b>	CO1	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems.
	CO2	Have a critical way of thinking based on current healthcare development
	CO3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues
	CO4	know National programme for the health care for the elderly and Social health programme
	CO5	know Community services in rural and Health promotion and education in school.
<b>BP803ET. PHARMA MARKETING MANAGEMENT</b>	CO1	understand marketing concepts and techniques and their applications in the pharmaceutical industry.
	CO2	know Definition, general concepts and scope of Product management in pharmaceutical industry.
	CO3	understand Methods, determinants of promotional mix and various online promotional techniques
	CO4	know appropriate marketing channel and physical distribution management
	CO5	know emerging concepts of marketing
<b>BP804 ET: PHARMACEUTICAL REGULATORY SCIENCE</b>	CO1	fundamental knowledge on the regulatory requirements for approval of new drugs
	CO2	fundamental knowledge on the regulatory requirements for approval of drug products in regulated markets of India
	CO3	Know about the process of drug discovery and development
	CO4	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
	CO5	Know the regulatory approval process and their registration in Indian and international markets
<b>BP 805T: PHARMACOVIGILANCE</b>	CO1	know History and development of pharmacovigilance with national and international scenario
	CO2	know Dictionaries, coding and terminologies used in pharmacovigilance
	CO3	understand Detection of new adverse drug reactions and their assessment with Adverse drug reaction reporting systems
	CO4	know Methods to generate safety data during pre clinical, clinical and post approval phases of drugs and Drug safety evaluation
	CO5	know Pharmacovigilance Program of India, ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning
	CO1	various methods and guidelines for evaluation and standardization of herbs and herbal drugs



<b>BP 806 ET. QUALITY CONTROL AND STANDARDIZATION OF HERBALS</b>	CO2	know WHO guidelines for quality control of herbal drugs
	CO3	know Quality assurance in herbal drug industry
	CO4	know the regulatory approval process and their registration in Indian and international markets
	CO5	appreciate EU and ICH guidelines for quality control of herbal drugs
<b>BP 807 ET. COMPUTER AIDED DRUG DESIGN</b>	CO1	understand Design and discovery of lead molecules
	CO2	understand The role of drug design in drug discovery process
	CO3	understand The concept of QSAR and docking
	CO4	understand Various strategies to develop new drug like molecules.
	CO5	understand The design of new drug molecules using molecular modeling software
<b>BP808ET: CELL AND MOLECULAR BIOLOGY</b>	CO1	Summarize cell and molecular biology with their functioning and composition
	CO2	Describe the chemical foundations of cell biology with nucleic acid properties and protein structure and function in cell biology
	CO3	Describe cellular membrane structure and function
	CO4	Describe basic of cell genetics and molecular genetic mechanisms and genetic analysis
	CO5	Summarize the Cell signaling and regulation of signaling pathway
<b>BP809ET. COSMETIC SCIENCE</b>	CO1	understand concept and evolution of cosmetics as per indian and EU regulations
	CO2	appreciate principles of formulation and evolution of skin and hair care products
	CO3	know Analytical techniques for cosmetics and role of herbs
	CO4	Principles of various instruments used for Cosmetic Evaluation
	CO5	know Basic understanding of Cosmetic problems associated with Hair and scalp and skin
<b>BP810 ET. PHARMACOLOGICAL SCREENING METHODS</b>	CO1	Appreciate the applications of various commonly used laboratory animals
	CO2	Appreciate and demonstrate the various screening methods used in preclinical research
	CO3	Appreciate and demonstrate the importance of biostatistics and research methodology
	CO4	Design and execute a research hypothesis independently
	CO5	research methodology and biostatistics for data analysis and interpretation with their Graphical representation
	CO1	understand the advanced instruments used and its applications in drug analysis



<b>BP 811 ET. ADVANCED INSTRUMENTATION TECHNIQUES</b>	CO2	understand the chromatographic separation and analysis of drugs
	CO3	understand the calibration of various analytical instruments
	CO4	know analysis of drugs using various analytical instruments
	CO5	know basic understanding of Hyphenated techniques-LC-MS/MS, GC-MS/MS, HPTLC-MS.
<b>BP 812 ET. DIETARY SUPPLEMENTS AND NUTRACEUTICALS</b>	CO1	Understand the need of supplements by the different group of people to maintain healthy life.
	CO2	Understand the outcome of deficiencies in dietary supplements
	CO3	Appreciate the components in dietary supplements and the application.
	CO4	Appreciate the regulatory and commercial aspects of dietary supplements including health claims.
	CO5	Regulatory Aspects; FSSAI, FDA, FPO, MPO, AGMARK. HACCP and GMPs on Food Safety. Adulteration of foods

