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| C101 | Human Anatomy & Physiology I |
| CO1 | Identify the structure of various types of cells and tissues in human body |
| CO2 | Define the gross anatomy and physiological functions of various bones and muscles of human body |
| CO3 | Recognize the normal ranges of blood components and physiological parameters |
| CO4 | Determine the abnormalities in the ranges of blood and physiological parameters |
| CO5 | Demonstrate the mechanism and functions of autonomic nervous systems and special senses |
| CO6 | Explain the anatomy and physiological functions of cardiovascular system |
| C102 | Pharmaceutical Analysis I |
| CO1 | To Understand the basic concept of preparation and representation of various forms of solution concentration |
| CO2 | The need to determining the quality of the pharmaceutical product and substances |
| CO3 | The concepts of basic methods and its disadvantages in determining the qualitative and quantitative aspects of pharmaceuticals |
| CO4 | Practical aspects of instrumentation and various techniques of measurement |
| CO5 | To understand the selection of suitable analytical techniques for analytical drugs and pharmaceuticals |
| C103 | Pharmaceutics I |
| CO1 | Explain history of profession of Pharmacy in India & Pharmacopeia and its development |
| CO2 | Learn parts and handling of prescription, posology & dose calculation of drug in children. Different types of dosage form |
| CO3 | Elaborate different pharmaceutical calculation involved in formulation |
| CO4 | Understand basic requirement and formulation of powder and liquid (monophasic& biphasic) dosages form |
| CO5 | Explain type of Pharmaceutical incompatibility |
| CO6 | Learn basic requirement, formulation and evaluation of suppositories and pessaries |
| CO7 | Understand the mechanisms of drug penetration and also the factors influencing permeation through transdermal route |
| CO8 | Explain the formulation and evaluation of semisolid preparation such as ointment, gel cream etc. |
| C104 | Pharmaceutical Inorganic Chemistry |
| CO1 | Well acquainted with the principles of limit tests |
| CO2 | Familiar with different classes of inorganic pharmaceuticals and their analysis |
| CO3 | Identification of different anions, cations and different inorganic pharmaceuticals |
| CO4 | Knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals understand the medicinal and pharmaceutical importance of inorganic compounds |
| CO5 | To have been introduced to a variety of inorganic drug classes. |
| C105 | Communication Skills |

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| CO1 | Able to understand the behavioural needs for a Pharmacist to function effectively in the areas of pharmaceutical operation |
| CO2 | Make the effective verbal and non-verbal communications |
| CO3 | Effectively manage the team as a team player |
| C106 | Remedial Biology |
| CO1 | Know about the kingdoms of plants, basic concepts and components of animal with reference to human |
| CO2 | Recognize the different cell inclusions, cell wall components and some secondary metabolites |
| CO3 | To know about the anatomy and physiology of animals in reference to human beings |
| C107 | Remedial mathematics |
| CO1 | Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences |
| CO2 | Create, use and analyse mathematical representations and mathematical relationships |
| CO3 | Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy |
| C108 | Human Anatomy and Physiology – Practical |
| CO1 | Describe the working principle and handling techniques of compound microscope |
| CO2 | Identify the histological structures of various types of cells and tissues in human body using microscope |
| CO3 | Define and identify the gross anatomy and physiological functions of various bones types of human body |
| CO4 | Recognize the various principle involved in estimation of blood components and physiological parameters |
| CO5 | Self-demonstrate the estimation of various blood components using standard protocol |
| CO6 | Determine the abnormalities in the ranges of blood and physiological parameters through interpreting the normal values |
| C109 | Pharmaceutical Analysis I –Practical |
| CO1 | To understand the different and how the glassware's measurement used in analytical chemistry |
| CO2 | To understand the principle, reactions, and data analysis involved in various volumetric methods of analysis |
| CO3 | To study on the quality of the pharmaceutical quantitatively |
| CO4 | To understand in selecting the right analytical technique |
| CO5 | To understand in analysis of samples by electro analytical technique |
| C110 | Pharmaceutics -Practical |
| CO1 | Understanding the pharmacopeia and their limits for the drugs |
| CO2 | Studying about different types of dosage and understanding the labelling requirements for each dosage form |
| CO3 | Elaborate different pharmaceutical calculation involved in formulation |
| CO4 | Understand basic requirement and formulation of powder and liquid (monophasic& biphasic) dosages form |

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| CO5 | Explain type of Pharmaceutical incompatibility: |
| CO6 | Learn basic requirement, formulation and evaluation of suppositories and pessaries |
| CO7 | Understand the mechanisms of drug penetration and also the factors influencing permeation through transdermal route |
| CO8 | Explain the formulation and evaluation of semisolid preparation such as ointment, gel cream etc. |
| C111 | Pharmaceutical Inorganic Chemistry – Practical |
| CO1 | Well acquainted with the principles of limit tests |
| CO2 | Familiar with different classes of inorganic pharmaceuticals and their analysis |
| CO3 | Identification of different anions, cations, and different inorganic pharmaceuticals |
| CO4 | Knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals understand the medicinal and pharmaceutical importance of inorganic compounds |
| CO5 | Well acquainted with the synthesis of some important inorganic drugs |
| C112 | Communication skills –Practical |
| CO1 | Able to develop the writing skills |
| CO2 | Improve the interview skills |
| CO3 | Understand the basic skills necessary for leadership qualities and essentials |
| C113 | Remedial Biology –Practical |
| CO1 | Know about the kingdoms of plants, basic concepts and components of animal |
| CO2 | Identification of gross anatomy and physiology of various bones |
| CO3 | Perform haematological tests and also record BP, heart rate & pulse |
| C114 | Human Anatomy & Physiology II |
| CO1 | Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences. |
| CO2 | Create, use and analyse mathematical representations and mathematical relationships |
| CO3 | Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy |
| C115 | Pharmaceutical organic Chemistry |
| CO1 | Knowledge about the type of isomerism |
| CO2 | Write the reaction, name the reaction and orientation of reactions |
| CO3 | Account for reactivity/stability of compounds, |
| CO4 | Identify/confirm the unknown organic compound |
| CO5 | Knowledge about the naming reactions of carbonyl compounds |
| CO6 | To perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration, etc. |
| C116 | Biochemistry |
| CO1 | Describe the role of biomolecules in metabolism |
| CO2 | Define the biochemical pathways for biomolecules |
| CO3 | Critically interpret how the biomolecules acts on the body and its mechanisms |
| CO4 | Link the biochemical reactions and pathways of several diseases |

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| CO5 | Explain the common laboratory values in clinical chemistry |
| CO6 | Use scientific laboratory equipment in order to gather and analyse data on biochemistry. |
| C117 | Pathophysiology |
| CO1 | Demonstrate a basic understanding of the ideas and fundamentals of disease |
| CO2 | Identify the Causes and mechanism of pathological process that result in disease |
| CO3 | Discuss clinical manifestations or signs and symptoms of selected disease processes and health problems |
| CO4 | Determine the consequences of the disease process in chronic and acute conditions |
| C118 | Computer Applications in Pharmacy |
| CO1 | Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement |
| CO2 | Design and develop solutions to analyse pharmaceutical problems using computers |
| CO3 | Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical related activities |
| CO4 | Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy |
| C119 | Environmental Sciences |
| 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 | Acquire skills to help the concerned individuals in identifying and solving environmental problems. |
| CO6 | Strive to attain harmony with Nature |
| C120 | Human Anatomy and Physiology II –Practical |
| CO1 | Identify the histological structures of vital organs and gonads in human body using microscope |
| CO2 | Demonstrate the general neurological examinations and reflex activities of human body |
| CO3 | Recognize the mechanisms of olfactory, gustatory and visual pathways |
| CO4 | Examine the body temperature, body mass index (BMI) and tidal volume |
| CO5 | Define the anatomy and physiological functions of nervous, integumentary digestive, urinary, respiratory, endocrine and reproductive systems |
| CO6 | Demonstrate the pregnancy diagnostic kit, cell analyzer and understand the detailed knowledge about various family planning devices |
| CO7 | Interpret the homeostatic mechanisms in human body and understand the disorders associated with their imbalances |
| C121 | Pharmaceutical Organic Chemistry I– Practical |
| CO1 | Synthesis of organic compounds and study about principles, reactions and mechanism |
| CO2 | Determination of some important physical properties like m.pt, b.pt, |

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| | solubility etc. |
| CO3 | Purification of Organic compounds |
| CO4 | Nomenclature of simple organic compounds in different classes and make 3D-Stereo models to learn easily. |
| CO5 | Systemic qualitative analysis of some unknown organic compounds |
| C122 | Biochemistry – Practical |
| CO1 | Know the qualitative analysis of biomolecules |
| CO2 | Know the quantitative analysis of biomolecules |
| CO3 | Analyze the bio molecules by analytical instruments |
| CO4 | Know the normal values of biomolecules |
| CO5 | Know the abnormal values of biomolecules |
| C123 | Computer Applications in Pharmacy – Practical |
| CO1 | Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement |
| CO2 | Design and develop solutions to analyze pharmaceutical problems using computers |
| CO3 | Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical related activities |
| CO4 | Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy |
| CO5 | Learn and apply the new methods in Web Technologies to reach out to the world |
| CO6 | Apply the methods of Database integration to communicate to the pharmacy |
| C201 | Pharmaceutical Organic chemistry II |
| CO1 | Understand the general principles and mechanisms involved in various organic reactions. |
| CO2 | Apply the knowledge of reactivity and orientation of organic reactions in synthesis of medicinal drugs and intermediates. |
| CO3 | Describe the chemistry of fats and oils. |
| CO4 | Learn the interpretation of the analysis for fats and oils. |
| CO5 | Know the medicinal uses and other applications of organic compounds |
| C202 | Physical Pharmaceutics I |
| CO1 | Define the basic concepts of the physicochemical properties of drug candidates |
| CO2 | Identify the solutions for the drug candidates with poor physicochemical properties |
| CO3 | Identify the solutions for improving the solubility of water insoluble drugs |
| CO4 | Identify the drug dissolution and partitioning properties of drug candidates with their improvement |
| CO5 | Critically interpret all the drug related properties and finding the best suitable dosage form |
| C203 | Microbiology |
| CO1 | Gain insight into the theory and practical aspects of microbiology |
| CO2 | Classify and explain the structure and general characteristics of various microorganism |
| CO3 | Understand various basic concepts of sterilization, disinfectants in |

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| | maintaining aseptic conditions |
| CO4 | Get insight into the pure culture technique, inoculations |
| CO5 | Describe validation parameter to be used for instrumentation evaluation. |
| CO6 | Design a clean room to maintain an industry, free of microbial ecosystem. |
| C204 | Pharmaceutical Engineering |
| CO1 | Design the layout for pharmaceutical operation unit |
| CO2 | Handle the equipment associated with liquid handling systems |
| CO3 | Chose right choice of materials and machines for pharma articles. |
| CO4 | Solve process related problems in pharma industry |
| CO5 | Design new pharma equipment |
| C205 | Pharmaceutical Jurisprudence |
| CO1 | Define the rules and regulations laid under Drugs and Cosmetics Act, 1940 |
| CO2 | Define the Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license |
| CO3 | Detail different Schedules of Drugs and Cosmetics and how various acts and rules are administered |
| CO4 | Understand the pharmacy education regulations, registration process and various rules and regulations implemented on narcotic drugs, medicinal and toilet preparations and Magic remedies |
| CO5 | To understand the process of Drug Price Control, Intellectual Property Rights and Right to information. |
| CO6 | Follow various ethics related to Pharmacy Profession. |
| C206 | Pharmaceutical Organic Chemistry-II |
| CO1 | Understand the general principles and mechanisms involved in various organic reactions. |
| CO2 | Apply the knowledge of reactivity and orientation of organic reactions in synthesis of medicinal drugs and intermediates |
| CO3 | Understand the purification techniques of synthesized compounds |
| CO4 | Acquire the knowledge about the interpretation of the analysis for fats and oils. |
| C207 | Physical Pharmaceutics-I-Practical |
| CO1 | Define the basic concepts of the physicochemical properties of drug candidates |
| CO2 | Able to identify the physicochemical properties of drug candidates |
| CO3 | Able to evaluate critically the physicochemical properties of drug candidates |
| CO4 | Identify the solutions for improving the physicochemical properties of drug candidates |
| CO5 | Critically interpret all the drug related properties and finding the best suitable dosage form |
| C208 | Microbiology-Practical |
| CO1 | Independently handle the pathogenic cultures, transferring the pure culture in microbiological laboratory without any contamination |
| CO2 | Able to identify specific organism by using morphological, cultural and biochemical test |
| CO3 | Able to assess and validate the efficiency of sterilization techniques and |

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| | disinfection procedures |
| CO4 | Know to make any environment free of microorganism or aseptic |
| CO5 | Critically interpret all the assessment methods to validate the disinfection and sterilization |
| C209 | Pharmaceutical Organic Chemistry III |
| CO1 | To understand the concepts of stereochemistry of organic compounds. |
| CO2 | understand the chemistry of heterocyclic compounds, their synthesis mechanisms, reactions and medicinal uses |
| CO3 | Have knowledge about important named reactions for synthesis of organic compounds. |
| C210 | Medicinal chemistry I |
| CO1 | Understand the basic practical concepts of Medicinal Chemistry |
| CO2 | Acquire adequate knowledge of practical aspects of chemical synthesis and purification of medicinal compounds and understand chemical synthetic reactions for selected drugs |
| CO3 | Knowledge on the estimation and purity of medicinal compounds |
| CO4 | Understand to interpret and analyze the medicinal compounds both quantitatively and qualitatively |
| CO5 | Find out partition co-efficient and dissociation constant of selected medicinal compounds |
| C211 | Physical pharmaceutics II |
| CO1 | Define the basic concepts and properties of the coarse, colloid and micron particles |
| CO2 | Identify the solutions for the instability problems in emulsions and suspensions |
| CO3 | Interpret the fundamental and derived properties of powders |
| CO4 | Conduct and interpret the stability studies |
| CO5 | Identify and prevent the degradation mechanisms of drug candidates |
| C212 | Pharmacology I |
| CO1 | Define and explain the basic concepts in Pharmacology. |
| CO2 | Explain the pharmacological actions of different categories of drugs and their therapeutic applications |
| CO3 | Correlate between Physiology, Biochemistry and Pathology to appreciate the pharmacotherapy for a disease |
| CO4 | Appreciate the concepts of adverse drug reactions, drug toxicity and drug - drug interactions to minimize the toxic effects of drugs. |
| CO5 | Explain the pharmacokinetic (ADME) and pharmacodynamic aspects of a drug. |
| CO6 | Explain the basic steps involved in the drug discovery and development process. |
| C213 | Pharmacognosy & Phytochemistry |
| CO1 | Know about the basic concept, history and background of Pharmacognosy. |
| CO2 | Learn about various methods of classification of crude drugs |
| CO3 | Understand the importance of the factors affecting the cultivation of crude drugs and know about the cultivation of some medicinally valued crude drugs |

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| CO4 | Recognize about the different cell inclusions, cell wall components and some secondary metabolites |
| CO5 | Familiarize with the Pharmacognosy of some of the important primary metabolites such as carbohydrates, lipids and protein containing drugs |
| CO6 | Distinguish about the different methods of adulteration of crude drugs. |
| C214 | MC-I Practical |
| CO1 | Understand the basic practical concepts of Medicinal Chemistry. |
| CO2 | Acquire adequate knowledge of practical aspects of chemical synthesis and purification of medicinal compounds and understand chemical synthetic reactions for selected drugs |
| CO3 | Knowledge on the estimation and purity of medicinal compounds |
| CO4 | Understand to interpret and analyze the medicinal compounds both quantitatively and qualitatively. |
| CO5 | Find out partition co-efficient and dissociation constant of selected medicinal compounds. |
| C215 | Physical Pharmaceutics-II -Practical |
| CO1 | Define the basic concepts of the stability, flow and rheological properties. |
| CO2 | Identify the rheological properties of solids and liquids. |
| CO3 | Identify the fundamental and derived properties of powders. |
| CO4 | Perform the stability studies for the pharmaceutical products |
| C216 | Pharmacology-Practical |
| CO1 | Define the basic concepts of experimental pharmacology. |
| CO2 | Identify the basic equipment and laboratory animals in experimental pharmacology |
| CO3 | Use simulation software/ videos for handling, routes of drug administration, blood collection, anaesthesia, etc, in laboratory animals |
| CO4 | Identify the effect of drugs on phenobarbitone sleeping time, ciliary motility, and rabbit eye by simulated experiments |
| CO5 | Perform the skeletal muscle relaxant, locomotor, and anticonvulsant activities by simulated experiments. |
| CO6 | Use software/videos to perform stereotype, anti-catatonic activity, anxiolytic and local anaesthetic activities |
| C217 | Pharmacognosy-practical |
| CO1 | Know about the basic concept, history and background of Pharmacognosy. |
| CO2 | Recognize about the different cell inclusions, cell wall components and some secondary metabolites. |
| CO3 | Familiarize with the Pharmacognosy of some of the important primary metabolites such as carbohydrates, lipids and protein containing drugs. |
| CO4 | Distinguish about the different methods of adulteration of crude drugs. |
| CO5 | Acquainted with knowledge about metabolites. |
| C301 | Medicinal Chemistry II |
| CO1 | Recognize the structure of drugs |
| CO2 | Predict the therapeutic action of drugs |
| CO3 | Understand chemical synthetic reactions for selected drugs. |
| CO4 | Knowledge on the structural activity relationship and structural influences on |

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| | pharmacological actions. |
| C05 | Describe the mechanism, use and mode of application of the important drugs. |
| C302 | Formulative Pharmacy |
| C01 | Define the important of pre-formulation |
| C02 | The students to understand the formulation and manufacturing aspects of various dosage forms. |
| C03 | The students will learn how to use the physicochemical properties of the drug/ excipients. |
| C04 | To development of pharmaceutical dosage forms |
| C05 | Describe the common measure use in quality. |
| C303 | Pharmacology II |
| C01 | Identify and explain the pharmacodynamics and pharmacokinetic properties of drugs of various categories |
| C02 | Recognize the adverse effects of drugs |
| C03 | Counter the adverse drug reactions |
| C04 | Recognize indications of different drugs and avoid contraindications |
| C05 | Provide vital information to patients about drugs during patient counselling |
| C06 | Design & execute animal experiments to identify the pharmacological properties of known drugs and unknown samples. |
| C304 | Pharmacognosy & Phytochemistry II |
| C01 | Define the basic metabolic pathways in higher plants and their role in the production of secondary metabolites |
| C02 | Define the general introduction, composition, chemistry & chemical classes, bio sources, therapeutic uses and commercial applications of secondary metabolites |
| C03 | Isolate, Identify and Analysis of various significant Phytoconstituents present in herbals |
| C04 | Produce, estimate and utilize the phytoconstituents at Industrial level. |
| C05 | Extract, isolate, purify, and identify the phytoconstituents by applying the latest techniques like Spectroscopy, chromatography and electrophoresis. |
| C305 | Pharmaceutical Biotechnology |
| C01 | Define the rules and regulations laid under Drugs and Cosmetics Act, 1940. |
| C02 | Define the Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license. |
| C03 | Detail different Schedules of Drugs and Cosmetics and how various acts and rules are administered |
| C04 | Understand the pharmacy education regulations, registration process and various rules and regulations implemented on narcotic drugs, medicinal and toilet preparations and Magic remedies. |
| C05 | To understand the process of Drug Price Control, Intellectual Property Rights and Right to information. |
| C06 | Follow various ethics related to Pharmacy Profession. |
| C306 | Formulative Pharmacy-Practical |
| C01 | Define the important of pre-formulation |

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| CO2 | The students to understand the formulation and manufacturing aspects of various dosage form. |
| CO3 | The students will learn how to use the physicochemical properties of the drug/ excipients |
| CO4 | To the development of pharmaceutical dosage forms with considering various parameters |
| CO5 | Describe the common measure in quality consideration |
| CO6 | Skill to develop various cosmetics preparation and Quality control parameters. |
| C307 | Pharmacology-II-Practical |
| CO1 | Define the basic concepts of experimental pharmacology |
| CO2 | Identify the commonly used laboratory apparatus and animals in experimental pharmacology. |
| CO3 | Calculate the dose to be administered and decide the route of administration of drugs in experiments. |
| CO4 | Design experiments to test the safety and efficacy of experimental drugs. |
| CO5 | Design and execute a bioassay to determine the potency and efficacy of experimental drugs. |
| CO6 | Use simulation software and tools to explain the effects of various drugs on isolated tissues and organs. |
| C308 | Pharmacognosy-II-Practical |
| CO1 | Define the basic metabolic pathways in higher plants and their role in the production of secondary metabolites. |
| CO2 | Define the general introduction, composition, chemistry & chemical classes, bio sources, therapeutic uses and commercial applications of secondary metabolites |
| CO3 | Isolate, Identify and Analysis of various significant phytoconstituents present in herbals. |
| CO4 | Produce, estimate and utilize the phytoconstituents at Industrial level |
| CO5 | Extract, isolate, purify, and identify the phytoconstituents by applying the latest techniques like Spectroscopy, chromatography and electrophoresis. |
| C309 | Medicinal chemistry III |
| 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 concept of prodrugs and their applications |
| CO5 | Acquire the knowledge about the SAR of drugs |
| C310 | Pharmacology III |
| CO1 | Identify and explain the pharmacodynamics and pharmacokinetic properties of drugs of various categories |
| CO2 | Recognize the adverse effects of drugs |
| CO3 | Counter adverse drug reactions |
| CO4 | Recognize indications of different drugs and avoid contraindications |

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| C05 | Provide vital information to patients about drugs during patient counselling |
| C06 | Design & execute animal experiments to identify the pharmacological properties of known drugs and unknown samples. |
| C311 | Herbal Drug Technology |
| C01 | To provide graduates with a good knowledge of the basic and applied know-how and professional skills in Herbal drug Science and Technology |
| C02 | They will acquire operative know-how and be able to carry out technical and management tasks |
| C03 | They will acquire knowledge on professional activities in the areas of transformation of medicinal herbs |
| C04 | To manage the quality of the processes of the medicinal plants and derivatives |
| C05 | Marketing of medicinal plants and derivatives for use in herbal, food and cosmetic products |
| C06 | Guaranteeing conformity with the national and EU laws in force. |
| C313 | Quality Assurance |
| C01 | Different types of Quality Management system |
| C02 | GMP and its individual criterion requirements |
| C03 | Good Laboratory Practices requirements |
| C04 | Complaints and Document maintenance and its handling procedure in pharmaceutical industry |
| C05 | Different types of analytical instruments and calibration procedures |
| C314 | MC-III-Practical |
| C01 | Perform the synthesis of medicinally important compounds or intermediates |
| C02 | Understand the various synthetic mechanisms |
| C03 | Understand the importance of drug design and basics in drawing chemical Structures using softwares |
| C04 | Know the methods for determination of partition coefficient of drugs for QSAR Analysis |
| C05 | Know the principle and operation techniques of microwave assisted organic Synthesis |
| C06 | Know the ADMET calculations by <i>in-silico</i> tools |
| C315 | Pharmacology-III-Practical |
| C01 | Identify the commonly used laboratory apparatus and animals in experimental pharmacology |
| C02 | Calculate the dose to be administered and decide the route of administration of drugs in experiments |
| C03 | Design experiments to test the safety and efficacy of experimental drugs |
| C04 | Use simulation software and tools to explain the effects of various drugs on isolated tissues and organs |
| C05 | Apply statistical methods and tools to analyse and assess experimental data in pharmacology |
| C316 | Herbal Drug Technology-Practical |
| C01 | Impart fundamental knowledge of basic understanding of herbal drug industry |
| C02 | Impart the quality of raw material |

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| CO3 | Guidelines for quality of herbal drugs |
| CO4 | Herbal cosmetics |
| CO5 | Natural sweeteners |
| CO6 | Neutraceuticals and appreciate patenting of herbal drugs, GMP |
| C401 | Instrumental methods of Analysis |
| CO1 | Know the instrumental techniques used in drug analysis |
| CO2 | Understand the theoretical aspects of spectroscopic techniques |
| CO3 | Know the theoretical aspects of chromatographic techniques |
| CO4 | Understand the qualitative analysis of various drugs |
| CO5 | Know the quantitative analysis of various drugs |
| C402 | Industrial Pharmacy II |
| CO1 | Understand the real time work flow of pharmaceutical manufacturing sector |
| CO2 | Face and manage regulatory audit processing |
| CO3 | Implement quality management systems in Pharmaceutical industry |
| CO4 | Submit regulatory application for GMP approval |
| CO5 | Design pharmaceutical manufacturing unit starting from pilot plant to storage area |
| C403 | Pharmacy practice |
| CO1 | Demonstrate knowledge and ability to use principles of hospital, community and clinical pharmacy for health promotion. |
| CO2 | Apply knowledge of drug distribution methods in hospital in the practice of pharmacy. |
| CO3 | Exhibit professional ethics and ensure appropriate medication use by the public. |
| CO4 | Deliver pharmaceutical care services like patient counselling using the best evidence. |
| CO5 | Apply principles of drug store management and inventory control to medication use. |
| C404 | Novel Drug Delivery System |
| CO1 | Define the basic concepts in novel drug delivery systems |
| CO2 | To study various properties for sustained and controlled drug delivery systems. |
| CO3 | To study formulation and evaluation of various controlled drug delivery system. |
| CO4 | To learn mucosal and transdermal drug delivery |
| CO5 | To study targeted delivery such as nanoparticles, liposome and noisome. |
| CO6 | To study the monoclonal antibody and IUCD. |
| C405 | Instrumental Methods of Analysis-Practical |
| CO1 | Know the instrumental techniques used in drug analysis |
| CO2 | Analyse the raw materials by various analytical instruments |
| CO3 | Analyse the formulations by various analytical instruments |
| CO4 | Know the use of software of various analytical instruments |
| CO5 | Analyse as per pharmacopoeia requirements |
| C406 | Practice School |
| CO1 | The students are able to describe the principles and mechanisms involved in the instrumentation, various laboratory techniques & patient care services. |

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| CO2 | To connect and communicate effectively with teachers, students, staff members and patients |
| CO3 | To acquire critical thinking and pragmatic skills underlying various concepts of research |
| CO4 | To handle & implement advanced instruments and technologies |
| CO5 | To be able to face the technical challenges at various employment levels |
| C407 | Biostatistics & Research Methodology |
| CO1 | Develop the ability to apply the methods while working on a research project work using DOE |
| CO2 | Describe the appropriate statistical methods required for a particular research design |
| CO3 | Choose the appropriate research design and develop appropriate research hypothesis for a research project with the help of Biostatistics and Design of experiments |
| CO4 | Develop an appropriate framework for research studies using Design experiments |
| C408 | Social & Preventive Pharmacy |
| CO1 | Acquire high consciousness / realization of current issues related to health and pharmaceutical problems within the country and worldwide |
| CO2 | Have a critical way of thinking based on current healthcare development |
| CO3 | Evaluated alternative ways of solving problems related to health and pharmaceutical issues |
| C409 | Pharma Marketing Management |
| CO1 | To understand the difference between marketing and selling and its research procedure |
| CO2 | Classification of different types Product and its life cycle analysis |
| CO3 | Different types of promotional procedure for products |
| CO4 | Channel of distributions and roles and responsibilities of PSR |
| CO5 | Pricing methodology and global marketing procedure |
| C410 | Pharmaceutical Regulatory Science |
| CO1 | Discuss the concept of innovator and generic drugs, drug development process |
| CO2 | Discuss the regulatory guidance's and guidelines for filing and approval process |
| CO3 | Enumerate the documents required for submission in CTD/eCTD |
| CO4 | Discuss the role of pharmacovigilance and the process of monitoring in clinical trial |
| CO5 | Describe the clinical trials requirements for approvals for conducting clinical trials |
| C411 | Pharmacovigilance |
| CO1 | Demonstrate knowledge and ability to identify, report and monitor adverse drug reactions and adverse events following immunizations. |
| CO2 | Classify drugs and diseases in individual case safety reports |
| CO3 | Apply pharmacovigilance methods to post marketing surveillance of drugs and vaccines. |
| CO4 | Employ pharmacogenetics to develop personalized medicine |

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| CO5 | Recognize regulatory requirements for pharmacovigilance in various countries |
| C412 | Quality control & Standardization of Herbs |
| CO1 | Standardize medicinal plant materials and dosage forms according to WHO guidelines |
| CO2 | Apply GMP, GAP, GLP, GACP in traditional system of medicine |
| CO3 | Understand EU and ICH guidelines for quality control of herbal drugs and Research Guidelines for Evaluating the Safety and Efficacy of Herbal Medicines |
| CO4 | Define Stability testing of herbal medicines and also the application of various chromatographic techniques in standardization of herbal products. |
| CO5 | To prepare documents for new drug application and export registration |
| C413 | Computer aided drug design |
| CO1 | Explain the methodology involved in design and discovery of lead molecules |
| CO2 | Identify the objectives of QSAR, molecular modeling and virtual screening methods |
| CO3 | Discuss the concepts of QSAR and docking |
| CO4 | Apply the strategies of drug design to develop new molecules with therapeutic activity |
| CO5 | Design new drugs using informatics and databases |
| C414 | Cell & Molecular Biology |
| CO1 | Gain insight into the cell cycle and mitotic and meiotic cell division |
| CO2 | Understand Cell Membrane structure and organization |
| CO3 | Get insights on the process of membrane transport and membrane models |
| CO4 | Explain Protein structure and general characteristics |
| CO5 | Principle of enzyme activity and enzyme inhibition |
| CO6 | Describe different cellular metabolic pathways |
| C415 | Cosmetic Science |
| CO1 | Know the multidisciplinary scientific knowledge to gain expertise in the field and to respond the industry challenges effectively |
| CO2 | To create a workforce in application of principles of cosmetic science |
| CO3 | Provide in depth learning in cosmetic science, which will serve as a focus for research in to the field of cosmetic science |
| C416 | Experimental Pharmacology |
| CO1 | Consider the regulations and ethical requirement for the usage of experimental animals |
| CO2 | Describe the various animals used in the drug discovery process and good laboratory practices |
| CO3 | Define the various newer screening methods involved in the drug discovery process |
| CO4 | Correlate the preclinical experimental data to humans |
| CO5 | Appreciate the importance of ethical and regulatory requirements for toxicity studies |
| CO6 | Design & execute animal experiments to identify the pharmacological properties of known drugs. |
| C417 | Advanced instrumental techniques |

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| CO-1 | Record and determine the structure of organic substances using NMR and Mass Spectra's |
| CO-2 | Use the basic knowledge on radio immune assays in carrying out immunological tests |
| CO-3 | Perform and interpret the results obtained during the calibration of analytical instruments |
| CO-4 | Develop Practical skills in the analysis of biological samples |
| CO-5 | Understand the Theoretical Aspects of the latest hyphenated techniques for nano analysis of drugs |
| C418 | Project Work |
| CO-1 | Educate students with strong theoretical and practical knowledge |
| CO-2 | Students are trained in terms of rational and critical analysis with effective problem troubleshooting. |
| CO-3 | Provide a general perspective and opportunities for students as per the industry requirement. |
| CO-4 | Apply appropriate research methodology while designing a project and can present, exhibit and document the project work. |
| CO-5 | Work in team and undertake a project in the area of Pharmacy |