COURSE OUTCOMES

Course Outcomes directly or indirectly contributed to the Program Outcomes, which is reflected from the graduated students of this institution. That is observable from the students' performance in their overall results, attitude in the field of work, performance in competitive examination, aptitude for higher studies and overall motivation towards the continuous learning throughout the life.

Bachelor of Pharmacy (B.Pharm) Course

Course of study for semester I			
Sl.No.	**Course code**	**Name of the course**	**Course Outcomes**
1	BP101T	Human Anatomy and Physiology I Theory	1. Understand the concept & terms of Anatomy & Physiology. 2. Able to identify and describe various organ system of Human body. 3. Know the few normal Patho-physiological test.
2	BP102T	Pharmaceutical Analysis I -Theory	1. Understand the fundamental concept of pharmaceutical analysis. 2. Able to perform qualitative and quantitative analysis of chemical compound with reference to Pharmacopeia, i.e. acid base, precipitation, nonaqueous, Complexometric, gravimetric analysis. 3. Know the source of errors and prequestionnaire measures. 4. Standardization of various solution and calibration of equipment & apparatus. 5. Assay of Inorganic chemical. 6. Know the Electrochemical methods of analysis for drug and drug products.
3	BP103T	Pharmaceutics I - Theory	1. Know the pharmaceutical care system in India. 2. Understand the preparation procedure of conventional dosage form and their route of administration. 3. Know the evolution of pharmacy profession. 4. Know the different type of calculation. 5. Understand the logic of incompatibilities.
4	BP104T	Pharmaceutical Inorganic Chemistry - Theory	1. Able to understand various type of impurities and their source in in-organic pharmaceutical preparation. 2. Know the preparation, uses of various in-organic chemical for various therapeutical purpose. 3. Understand the use & dosage of radio pharmaceutical in health care.

5	BP105T	Communication skills -Theory *	1. Familiarize the student with the sounds of English in a nutshell, particularly long and short vowels, some consonants stress and intonation. 2. Provide adequate listening and speaking practice so that the learner can speak with ease, fluency and reasonable clarity in common everyday situation and on formal occasions 3. Use grammar in meaningful contexts. 4. Things with words, i.e. to perform functions like ordering, requesting, inviting and so on 5. Know nonverbal communication and casual body language, sexist language.
6	BP106RBT	Remedial Biology Theory*	1. Able to understand the concept of morphology & anatomy of different plant parts. 2. Able to understand the scientific nomenclature of plants and animal kingdom. 3. Able to understand the life history of some insects. 4. Learn some microscopic examination of plan parts.
7	BP106RMT	Remedial Mathematics- Theory*	1. Able to do the simple mathematics, understand the various formulas (Algebra, Trigonometry, Geometry, Calculus) and statistical expressions of analytical data. 2. Evaluation of raw data and compilation and their pharmaceutical application
Course of study for semester II			
8	BP201T	Human Anatomy and Physiology II – Theory	1. Understand the concept of Anatomy & Physiology. 2. Able to identify and describe various organ system of Human body. 3. Effect of biochemical parameters in various human disorder.
9	BP202T	Pharmaceutical Organic Chemistry I – Theory	1.Explain atomic molecular structure, chemical bonding and physiochemical properties of substance. 2.Demonstrate the concepts and results of laboratory experiments of physicochemical properties of organic chemical substance. 3.Understand the various type of organic reaction and their mechanism. 4.Know the preparation and property of alkanes, cycloalkanes, alkenes, alkynes, haloalkanes, alcohol, ethers amine 5.Know the determination of melting point and boiling point.
10	BP203T	Biochemistry – Theory	1. Understand the biochemical organization of cell and transport process. 2. Know the name and function of enzyme & coenzymes. 3. Understand the carbohydrate lipid and protein metabolism.

			4. Understand the synthesis of protein and nucleic acid. 5. Preparation and evaluation of various biochemical and bio fluids.
11	BP204T	Pathophysiology – Theory	1. Know the pathophysiology of common diseases. 2. Know the etiology and pathogenesis of the selected disease states; 3. Know the complications of the diseases.
12	BP205T	Computer Applications in Pharmacy – Theory *	1. Know the fundamentals of Computer's history, hardware, networking, numbering and software. 2. Understand the various uses of computer in pharmaceuticals research and development. 3. Know the various operating system like dos, windows, Linux, file manipulations and maintenance. 4. Know some programming language able to handle internet, email and search engine.
13	BP206T	Environmental sciences – Theory *	1. Understand the ecological concept and natural resource. 2. Know the water pollution, method of waste water treatment. 3. Know the technique of solid waste management, hazards management including air pollution and noise pollution. 4. Know the concept of waste minimization. 5. Know the method of environment impact assessment.
1. **Course of study for semester III**			
14	BP301T	Pharmaceutical Organic Chemistry II – Theory	1. Understand the basic concept of Sterio-chemistry. 2. Understand the general method of preparation and related reaction for aldehydes and Ketones. 3. Understand the aromatics compound & their preparation. 4. Understand the nucleophilic aromatics substitution reaction. 5. Able to identify the functional group of organic compounds.
15	BP302T	Physical Pharmaceutics I – Theory	1. Define and recall fundamental physical theories of matter in the development of dosage forms. 2. Know the thermo-chemical reaction and phase rule. 3. Know the different kind of solutions and buffer used in pharmaceutical preparation. 4. Select proper physical and chemical principles in quality control of pharmaceutical dosage forms.

16	BP303T	Pharmaceutical Microbiology – Theory	1. Know the history and scope of microbiology. 2. Know the classification and taxonomy of Microbes. 3. Understand the strains of Microbes. 4. Understand the Microbial genetics, control of microbes by physical and chemical method. 5. Know the sterility testing of Pharma products. 6. Know the microbiological assay of antibiotics. 7. Know the preparation of various nutrient media for microbes and sterilization method.
17	BP304T	Pharmaceutical Engineering – Theory	1. Understand the concept of fluid flow, measurement of flow and pressure. 2. Know the basic concept of dehumidification and humidity control and their application in pharmacy. 3. Know the material handling system like liquid, solid & gas handling. 4. Know the principles of centrifugation. 5. Understand the Crystallization method of super saturation theory and its limitation. 6. Know the industrial hazards and safety precaution.
Course of study for semester IV			
18	BP401T	Pharmaceutical Organic Chemistry III– Theory	1. Understand the nomenclature of heterocyclic compounds and their preparation. 2. Know the Classification and little chemistry of carbohydrate, lipid, amino acid, protein and nucleic acid. 3. Know the some important organic, name reaction and their mechanism.
19	BP402T	Medicinal Chemistry I – Theory	1. Know the physiochemical aspect of drug molecules and their biological action. 2. Understand the quantitative structural activity relationship concept. 3. Know the classification, Mechanism, use and structure activity relationship of few important therapeutic categories. 4. Know the synthesis and identification test for some official drugs and its product.
20	BP403T	Physical Pharmaceutics II – Theory	1. Understand the basic concept and evaluation of micromeritics and powder rheology. 2. Know the theory of colloidal dispersion system. 3. Know the method of half-life determination. 4. Know the method of solubility expression and determination. 5. Know the various type of complex, their method of preparation, analysis and application in various field.

21	BP404T	Pharmacology I – Theory	1. Understand the route of administration, mechanism of action and combined effect of drugs. 2. Understand the Pharmacokinetic parameters of drugs. 3. Know the name, category & action of drugs acting on nervous system. 4. Know the preparation of different solution for animal study. 5. Know the screening and procedure of different drugs in animal model.
22	BP405T	Pharmacognosy and Phytochemistry I– Theory	1. Understand the extraction, isolation and chemical test of alkaloids. 2. Know the source cultivation, collection, chemical constituted and microscopic features of various alkaloids containing crude drugs. 3. Know the common vernacular name, botanical source and uses of traditional marketed formulation. 4. Understand the utilization of production, standardization of few phyto constituent. 5. Understand the holistic concept of traditional medicine. 6. Understand the structural illustration of simple molecule nature of origin by spectroscopic approach. 7. Know the pharmacological properties, source and structure of cardia glycosides, terpenes, alkaloids & flavonoids. 8. Know the various vitamins, disease cause by deficiency vitamins. 9. Know the analysis of fixed oil, phenolic compounds, essential oils and Separation of drugs of chemical constituent by chromatography.
Course of study for semester V			
23	BP501T	Medicinal Chemistry II – Theory	1. Understand the classification, mode of action, uses and SAR of few therapeutic important categories, i.e. drug acting of CNS, Cardiovascular system. 2. Know the synthetic route of few important drugs. 3. Understand the nomenclature, stereochemistry, medicinal uses of some important steroids. 4. Know the identification and purity test of some important official drugs.
24	BP502T	Industrial Pharmacy I– Theory	1. Know the various pharmaceutical dosage forms and their manufacturing techniques. 2. Know various considerations in development of pharmaceutical dosage forms 3. Formulation and evaluation of solid, liquid and semisolid dosage forms.

25	BP503T	Pharmacology II – Theory	1. Know the name & uses of drug acting on cardiovascular system. 2. Know the drugs used as haematinics and anticoagulants. 3. Know the drug in used in urinary system. 4. Understand the name & function of autocoids. 5. Understand the bioassay & standardization of biological. 6. Understand the pharmacological screening of some therapeutical important drugs.
26	BP504T	Pharmacognosy and Phytochemistry II– Theory	1. This course is one of the most advanced introductions in Herbal Medicines that is offered. Will learn and get experience about 1. Herbs, and their Science. 2. Classification of Medicinal Plants, Phytochemistry, Carbohydrates, Lipids, 3. Terpenes, Polyphenols, Alkaloids, Pharmacology, Toxicity, Formulations and Preparations of Herbal Medicines. 4. How herbs influence our physiology and can be helpful against several disorders. 5. Relations between Phyto-therapy and the Elderly, Phytotherapy and Children, Understanding Herbal Action, and Understanding the Materia Medica. 6. The recognition of medicinal plants, identification of adulteration and Contamination. 7. Ethnobotany & Ethnopharmacology in drug discovery process. 8. DNA Finger printing.
27	BP505T	Pharmaceutical Jurisprudence – Theory	1. Understand the various pharmaceutical legislation. 2. Know the code of pharmaceutical ethics. 3. Know various act and rules used to control the manufacturing distribution, uses of pharmaceutical product. 4. Know the various act to control pharmaceutical education and regulation.
Course of study for semester VI			
28	BP601T	Medicinal Chemistry III – Theory	1. Understand the drug metabolism and concept of prodrugs. 2. Able to understand mechanism of action, classification, structure, uses of some important therapeutically classes. 3. Know the synthetic approach of few important therapeutic agents.
29	BP602T	Pharmacology III – Theory	1. Know the drug acting on gastrointestinal track. 2. Understand the pharmacology of drugs affecting endocrine system. 3. Understand the general principal of Chemotherapy. 4. Evaluate the toxicological effect of chemicals.

30	BP603T	Herbal Drug Technology – Theory	1. Know the traditional knowledge related to herbal drugs. 2. Understand the standardization techniques of herbal drug. 3. Develop the new herbal formulation on the basis of Ayurveda principle as per ayurvedic pharmacopoeia. 4. Know some important quality control test for herbal drugs.
31	BP604T	Biopharmaceutics and Pharmacokinetics – Theory	1. Understand the relationship between drug and biological system. 2. Understand the different pharmacokinetic model and their utilities. 3. Know the measure bioavailability and understand bioequivalence.
32	BP605T	Pharmaceutical Biotechnology – Theory	1. Understand and recall the historical development in pharmaceutical biotechnology. 2. Describe the basic principle of antigen antibody reaction mechanism related to immunity of human body. 3. Learn the biochemistry aspects specifically, the metabolism, nitrogen and sulphur cycles, gene code in protein formation, chemistry basic information regarding DNA and its replication, RNA types and its transcription and translation etc. 4. Understand basic idea of enzymes, protein, vitamins and biological oxidation process in living cells. 5. Understand concept of chemistry of living systems which will further help in understanding of drug interaction in the body, drug-protein binding etc.
33	BP606T	Pharmaceutical Quality Assurance – Theory	1. Understanding the quality assurance & control of pharmaceuticals. 2. Know the in detail about ICH guidelines and regulations like GMP, CGMP for quality assurance. 3. Understand the type & method of validation. 4. Understand the TQM, IPR, ISO, SOP 5. Understand the concept of activities of drug regulatory affairs. 6. Know the documentation in Pharmaceutical Industry. 7. Know About the GLP and warehousing practice.
Course of study for semester VII			

34	BP701T	Instrumental Methods of Analysis – Theory	1. Understand the interaction of matter with electromagnetic radiations regarding its qualitative and quantitative analysis of drugs. 2. Understand the chromatographic separation and analysis of drugs. 3. Perform quantitative & qualitative analysis of drugs and its products using various analytical instruments.
35	BP702T	Industrial Pharmacy II – Theory	1. Application of fundamental knowledge on pharmaceutical product development and transformation from laboratory to market. 2. Know the process of pilot plant and scale up of pharmaceutical dosage forms 3. Know different Laws and Acts that regulate pharmaceutical industry 4. Understand the approval process and regulatory requirements for drug products.
36	BP703T	Pharmacy Practice – Theory	1. Understand the national use of drugs. 2. Know the essential use of drug. 3. Understand the Pharmaco economics. 4. Learn the drug information system. 5. Understand the public health police. 6. Learn how to patient history and initial therapeutic management.
37	BP704T	Novel Drug Delivery System – Theory	1. To understand various approaches for development of novel drug delivery systems. 2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation
Course of study for semester VIII			
38	BP801T	Biostatistics and Research Methodology	1. Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment) 2. Know the various statistical techniques to solve statistical problems 3. Appreciate statistical techniques in solving the problems**.**
39	BP802T	Social and Preventive Pharmacy	1. Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide. 2. Have a critical way of thinking based on current healthcare development. 3. Evaluate alternative ways of solving problems related to health and pharmaceutical issues
40	BP803ET	Pharma Marketing Management	1. Understand the requirement of planning, organizing, staffing and controlling. 2. Get a concept of different kind of management. 3. Understand the principle of accountancy, Ledger posting, book entry & preparation of trial balance etc.

			4. Principle of economics in regard of demand and supply. 5. Understand the mode of marketing in regards of salesmanship and market research. 6. Know the process of inventory control and maintenance management.
41	BP804ET	Pharmaceutical Regulatory Science	1. Know about the process of drug discovery and development 2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals 3. Know the regulatory approval process and their registration in Indian and 4. international markets
42	BP805ET	Pharmacovigilance	1. Why drug safety monitoring is important? 2. History and development of pharmacovigilance 3. National and international scenario of pharmacovigilance 4. Dictionaries, coding and terminologies used in pharmacovigilance 5. Detection of new adverse drug reactions and their assessment 6. International standards for classification of diseases and drugs 7. Adverse drug reaction reporting systems and communication in pharmacovigilance 8. Methods to generate safety data during pre-clinical, clinical and post approval phases of drugs' life cycle. 9. Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation 10. Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India 11. ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning 12. CIOMS requirements for ADR reporting 13. Writing case narratives of adverse events and their quality.
43	BP806ET	Quality Control and Standardization of Herbals	1. Know WHO guidelines for quality control of herbal drugs 2. Know Quality assurance in herbal drug industry 3. Know the regulatory approval process and their registration in Indian and international markets 5. Appreciate EU and ICH guidelines for quality control of herbal drugs
44	BP807ET	Computer Aided Drug Design	1. Design and discovery of lead molecules 2. The role of drug design in drug discovery process 3. The concept of QSAR and docking 4. Various strategies to develop new drug like molecules. 5. The design of new drug molecules using molecular modelling software

45	BP808ET	Cell and Molecular Biology	1. Summarize cell and molecular biology history. 2. Summarize cellular functioning and composition. 3. Describe the chemical foundations of cell biology. 4. Summarize the DNA properties of cell biology. 5. Describe protein structure and function. 6. Describe cellular membrane structure and function. 7. Describe basic molecular genetic mechanisms. 8. Summarize the Cell Cycle
46	BP809ET	Cosmetic Science	1. Formulation and evaluation of skin care product, hair care product, and nail care product, etc. 2. Understand the sunlight protection, classification of sunscreens and SPF.
47	BP810ET	Experimental Pharmacology	1. Appreciate the applications of various commonly used laboratory animals. 2. Appreciate and demonstrate the various screening methods used in preclinical 3. research 4. Appreciate and demonstrate the importance of biostatistics and research methodology 5. Design and execute a research hypothesis independently
48	BP811ET	Advanced Instrumentation Techniques	1. Understand the advanced instruments used and its applications in drug analysis 2. Understand the chromatographic separation and analysis of drugs. 3. Understand the calibration of various analytical instruments 4. Know analysis of drugs using various analytical instruments.
49	BP812ET	Dietary Supplements and Nutraceuticals	1. Understand the need of supplements by the different group of people to maintain 2. healthy life. 3. Understand the outcome of deficiencies in dietary supplements. 4. Appreciate the components in dietary supplements and the application. 5. Appreciate the regulatory and commercial aspects of dietary supplements including health claims
50	BP813PW	Project Work	1. Ability to Lead and work in a group. 2. Understand how to literature how to be search 3. Social and economic requirement in the field of health care. 4. To design the new research projects. 5. Evaluate the research data 6. Know the systematic project writing

INSTITUTE OF PHARMACY & TECHNOLOGY, SALIPUR

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(Regd. No.5226/371/1987-88 of Societies Act. XXI of 1860)

(ISO 9001:2015 Certified)

B.Pharm Course Accredited By NBA

Estd.:1982

Approved by All India Council for Technical Education, Pharmacy Council of India, & Govt. of Odisha.

Affiliated to Biju Patnaik University of Technology & Odisha State Board of Pharmacy, Odisha.

Master of Pharmacy (M.Pharm) Course

Course of study for M. Pharm. (Pharmaceutics) Semester-I

Sl.No.	Course code	Name of the course	Course Outcomes
1	MPH101T	Modern Pharmaceutical Analytical Techniques	1. Know the quality of Chemicals and Excipients uses in Pharmaceuticals 2. The analysis of various drugs in single and combination dosage forms 3. Theoretical and practical skills of the various instruments used in analysis.
2	MPH102T	Drug Delivery System	1. The various approaches for development of novel drug delivery systems. 2. The criteria for selection of drugs and polymers for the development of various delivering system. 3. Formulation and evaluation of Novel drug delivery systems.
3	MPH103T	Modern Pharmaceutics	1. The elements of pre-formulation studies. 2. The Active Pharmaceutical Ingredients and Generic drug Product development 3. Industrial Management and GMP Considerations. 4. Optimization Techniques & Pilot Plant Scale Up Techniques. 5. Stability Testing, sterilization process & packaging of dosage forms.
4	MPH104T	Regulatory Affair	1. The Concepts of innovator and generic drugs, drug development process. 2. The Regulatory guidance's and guidelines for filing and approval process. 3. Preparation of Dossiers and their submission to regulatory agencies in different countries. 4. Post approval regulatory requirements for actives and drug products 5. Submission of global documents in CTD/ eCTD formats 6. Clinical trials requirements for approvals for conducting clinical trials 7. Pharmacovigilance and process of monitoring in clinical trials.

Course of study for M. Pharm. (Pharmaceutics) Semester-II

Sl.No.	Course code	Name of the course	Course Outcomes
1	MPH201T	Molecular Pharmaceutics (Nano Tech and Targeted DDS)	1. The various approaches of Nano technology in the development of targeted drug delivery systems. 2. The criteria for selection of drugs and polymers for the development of Targeted drug delivery system. 3. The formulation and evaluation of novel drug delivery systems.
2	MPH202T	Advanced Biopharmaceutics & Pharmacokinetics	1. The basic concepts in biopharmaceutics and pharmacokinetics. 2. The use raw data and derive the pharmacokinetic models. 3. The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
3	MPH203T	Computer Aided Drug Delivery System	1. History of Computers in Pharmaceutical Research and Development 2. Computational Modelling of Drug Disposition. 3. Computers in Preclinical Development 4. Optimization Techniques in Pharmaceutical Formulation 5. Computers in Market Analysis 6. Computers in Clinical Development 7. Artificial Intelligence (AI) and Robotics Computational fluid dynamics (CFD)
4	MPH204T	Cosmetic and Cosmeceuticals	1. Key ingredients used in cosmetics and cosmeceuticals. 2. Key building blocks for various formulations. 3. Current technologies in the market 4. Various key ingredients and basic science to develop cosmetics and cosmeceuticals. 5. Scientific knowledge to develop cosmetics and cosmeceuticals with desired safety, stability, and efficacy.

Course of study for M. Pharm. (Pharmaceutical Analysis) Semester-I

Sl.No.	Course code	Name of the course	Course Outcomes
1	MPA101T	Modern Pharmaceutical Analytical Techniques	1. The analysis of various drugs in single and combination dosage forms 2. Theoretical and practical skills of the instruments
2	MPA102T	Advanced Pharmaceutical Analysis	1. Know the appropriate protocol for analytical method development. 2. Principles of various reagents and chemicals used in functional group analysis that renders necessary support in research methodology and demonstrates its application in the practical related problems. 3. Qualitative and quantitative analysis of various impurities like residual solvents, element in drugs and biological products 4. To know the stability testing of drug, drug products & phytopharmaceuticals. 5. To know the biological test & assay procedures of vaccine, serum etc. 6. To know the various principle & procedures for Immunoassays (IA)
3	MPA103T	Pharmaceutical Validation	1. Explain the aspect of validation 2. Carryout validation of manufacturing processes 3. Apply the knowledge of validation to instruments and equipment's 4. Validate the manufacturing facilities
4	MPA104T	Food Analysis	1. Food constituents 2. Food additives 3. Finished food products 4. Pesticides in food 5. And also, student shall have the knowledge on food regulations and legislations

Course of study for M. Pharm. ((Pharmaceutical Analysis) Semester-II

Sl.No.	Course code	Name of the course	Course Outcomes
1	MPA201T	Advanced Instrumental Analysis	1. Interpretation of the NMR, Mass and IR spectra of various organic 2. compounds 3. Theoretical and practical skills of the hyphenated instruments 4. Identification of organic compounds
2	MPA202T	Modern Bio-Analytical Techniques	1. Extraction of drugs & metabolites from biological samples 2. Separation of drugs from biological samples using different techniques 3. Guidelines for BA/BE studies. 4. To know the pharmacokinetic & toxicokinetic of drug & drug products. 5. To know the various cell culture techniques.
3	MPA203T	Quality Control and Quality Assurance	1. Understanding the cGMP aspects in a pharmaceutical industry 2. To know about the documentation in pharmaceutical industry 3. To understand the scope of quality certifications applicable to pharmaceutical industries 4. To know about the various responsibilities of QA & QC departments in pharmaceutical industry
4	MPA204T	Herbal and Cosmetic Analysis	1. Determination of herbal remedies and regulations 2. Analysis of natural products and monographs 3. Determination of Herbal drug-drug interaction 4. Principles of performance evaluation of cosmetic products.

Course of study for M. Pharm. (Pharmaceutical Chemistry) Semester-I

Sl.No.	Course code	Name of the course	Course Outcomes
1	MPC101T	Modern Pharmaceutical Analytical Techniques	1. Spectral analysis of various drugs in single and combination dosage forms by using UV, IR, NMR, MASS etc. 2. The knowledge about the Theoretical and practical skills of the instruments & Chromatography techniques of data interpretation and its applications 3. Know about the electrophoresis, potentiometric & thermal techniques for its application on pharmaceutical science.
2	MPC1012T	Advanced Organic Chemistry -I	1. The principles & theory of retrosynthesis for their applications in drug discovery. 2. Know the mechanism & applications of various named reactions for synthesis of new Chemical entity. 3. The concept of disconnection to develop synthetic routes for small target molecule. 4. Application of various catalysts used in organic synthesis and reaction. 5. Know the details chemistry of heterocyclic moity for its application in drug synthesis.
3	MPC103T	Advanced Medicinal chemistry	1. The knowledge and the process of different stages of drug discovery techniques. 2. Use of medicinal chemistry in drug discovery & research 3. Know the various strategies to rational design and approaches to develop new drug like molecules for its therapeutic targets 4. Know the theory & application of Peptidomimetics in drug discovery.
4	MPC104T	Chemistry of Natural Products	1. Know the basic principle & theory of different types of natural compounds and their medicinal importance. 2. The significance of natural compounds as lead molecules for new drug discovery. 3. Know the principle concept of rDNA technology tool for discovery of new molecules having significant biological activity. 4. The different techniques used for structural elucidation of isolated chemicals from natural origin. 5. Know the principle & theory of separation techniques for isolation, purification and characterization of simple chemical constituents from natural source.

Course of study for M. Pharm. (Pharmaceutical Chemistry) Semester-II

Sl.No.	Course code	Name of the course	Course Outcomes
1	MPC201T	Advanced Spectral Analysis	1. Detail knowledge about interpretation of the different spectral data like NMR, Mass and IR of various organic compounds. 2. Know the basic of hyphenated techniques and practical skills of the latest hyphenated instruments used in drug discovery. 3. Identification of organic compounds by spectroscopy & chromatography techniques.
2	MPC202T	Advanced Organic Chemistry -II	1. Know the basic theory, principles and applications of Green chemistry in drug discovery process. 2. The detail knowledge of peptide chemistry for its application in pharmaceutical sciences. 3. The different catalysts used in organic reactions for lead molecule synthesis. 4. The detail knowledge of stereochemistry and asymmetric synthesis. 5. Application of stereochemistry in drug design.
3	MPC203T	Computer Aided Drug Design	1. Basic knowledge of Computer Aided Drug Design. 2. Importance of rational drug designing by using computational tools for discovery a molecule. 3. Various CADD techniques used to designing and validating of novel chemicals having drug like property. 4. The theory of molecular modelling and use of modelling software's to design new chemical having good pharmacological property. 5. Knowledge and hands on training of the in silico virtual screening protocols for designing a drug.
4	MPC204T	Pharmaceutical Process Chemistry	1. The theory & principle of process chemistry and their strategies of scale up process for API's and intermediates. 2. Know the various unit operations techniques and different reactions in process chemistry 3. The basic knowledge of reaction kinetics analysis. 4. The detail knowledge about industrial safety protocol used in process chemistry.

Program specific outcome for Bachelor of Pharmacy course

PSO.1 Graduates will demonstrate knowledge related to Pharmaceutical Dosage Form preparation, Quality Standard, Regulatory control, distribution, storage and uses in different set-up i.e., Industry, Hospital and Community.

PSO.2 Graduates will demonstrate an ability to drug synthesis, screening and formulation design as per needs of the society.

PSO.3 The graduate will demonstrate skills to use modern pharmaceutical tools, software and equipment to analyse & solve the pharmaceutical problems.

PSO.4 Graduates will demonstrate the knowledge regarding professional ethics.

PSO.5 The graduate should have knowledge regarding rational uses of medicines.

PSO.6 The graduate will be able to communicate effectively to the general and scientific community.

Program Specific Outcomes for Master of Pharmacy in Pharmaceutical Chemistry

PSO.1 Graduate should know regarding various advanced analytical instrumental techniques for identification, characterization and quantification of drugs.

PSO.2 Graduate should have knowledge about current organic chemistry and their application in the drug discovery.

PSO.3 Graduate should have knowledge about modern tool used for drug discovery.

PSO.4 Graduate should have knowledge ability to interpretation the structure using spectral data.

PSO.5 Graduate should have knowledge regarding drug discovery from natural origin.

PSO.6 The graduate will be able to communicate effectively to the general and scientific community.

Program Specific Outcomes for Master of Pharmacy in Pharmaceutical Analysis

PSO.1 Graduate should know regarding various advanced analytical instrumental techniques for identification, characterization and quantification of drugs.

PSO.2 Graduate should have ability to analyse the drugs and dosage form for its quality standard.

PSO.3 Graduate should have knowledge regarding different type of validation and their methodology.

PSO.4 Graduate should have knowledge on analysis of food products, food additives, the pesticides and the regulations of food and legislations of food products.

PSO.5 Graduate should have knowledge regarding advance tool for analysis, sample collection, separation, CGMP, GLP and other regulatory aspects.

PSO.6 The graduate will be able to communicate effectively to the general and scientific community.

Program Specific Outcomes for Master of Pharmacy in Pharmaceutics

PSO.1 Graduate should have knowledge on the novel drug delivery systems, approaches, criteria for selection of polymers and drugs and their formulation and evaluation.

PSO.2 Graduate should have known to pre-formulation studies, regulatory guideline, pilot plant scale of techniques and stability study.

PSO.3 Graduate should have knowledge regarding Pharmacokinetics and pharmacodynamics related aspect of dosage form.

PSO.4 Graduate should develop skill in pharmaceutical research, Pharmacoinformatic, in drug development in Computational modelling, Preclinical development, clinical development, Artificial Intelligence and Robotics, and Computational fluid dynamics.

PSO.5 Graduate should have knowledge on cosmeceuticals, controlled release formulations, floating drug delivery systems, transdermal drug delivery systems, micromeritics, and mathematical simulations and their analysis by using advance instrumental tool.

PSO.6 The graduate will be able to communicate effectively to the general and scientific community.

PROGRAM OUTCOMES

1. **Pharmacy Knowledge:** 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.
2. **Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyse, evaluate and apply information systematically and shall make defensible decisions.
4. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
5. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfilment 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.
6. **Professional Identity:** Understand, analyse and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
7. **Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behaviour 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.
8. **Communication:** 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.
9. **The Pharmacist and society:** 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.
10. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11. **Life-long learning:** 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 feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.