2.6.1 : Programme and course outcomes for all Programmes offered by the institution sare stated and displayed on website and communicated to teachers and students.

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DESCRIPTION

- The Program Outcomes (PO's) and Course Outcomes (CO's) determine the academic teaching value of each Program and Courses of the Institute offers. The institute created its Program outcome (PO's) and Course Outcomes (CO's) to line up with each Program's objectives as well as its vision, mission, and quality policy.
- Course outcomes predict that students will acquire all the fundamental knowledge that is anticipated following successful completion of that course.
- Program outcomes and course outcomes main aim is to develop skills that are essential for developing students' capacity and personalities.
- All UG and PG Programs PO's, CO's, and PSO's are prepared by consultations with the Subject Experts.
- All course outlines are initially given to the IQAC and Academic Planning Committee for approval, after which they are posted on the notice boards.
- All the faculty and students are informed about the PO's, PSO's, and Course Outcomes (CO's) of every program offered by the institute.
- At the start of the academic year, lesson plans are created using the course objectives, course outcomes, teaching resources, and total number of teaching hours.
- These outcomes are declared and uploaded on the College Website (www.acop.edu.in).
- The assessment of students is done in the context of these to ensure that the teaching-learning process is effective, and thus enables the faculty to concentrate on the achievement of these goals.

Programme Outcomes (POs)

B.Pharmacy

- PO1. **Pharmacy Knowledge**: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.

- PO2. **Planning Abilities**: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize workto meet deadlines.

- PO3. **Problem analysis**: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate andapply information systematically and shall make defensible decisions.

- PO4. **Modern tool usage**: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

- PO5. **Leadership skills**: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.

- PO6. **Professional Identity**: Understand, analyze and communicate the value of their professional rolesin society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).

- PO7. **Pharmaceutical Ethics**: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

- PO8. **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.

- PO9. **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.

- PO10. **Environment and sustainability**: Understand the impact of professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

- PO11. **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 on-going basis.

Pharm.D

- **PO1 COMPREHENSIVE PHARMACY AND CLINICAL KNOWLEDGE:** Demonstrate the acquisition and application of core knowledge and skills relevant to the developm ent of the pharmaceutical, biomedical, clinical, and epidemiological scie
  nces. This includes competencies in disciplines that support quality pharmaceutical practice (e.g. p harmacy, medicinal chemistry, pharmacokinetics, pharmacodynamics, pharmacology, pathophysio logy, pharmacotherapy, drug care).

- **PO2PATIENT–CENTEREDCARE**:
  Develop and modify medication care plans, independently or as part of a healthcare team, to provi de patientcentered care to a diverse range of patients, using the best available evidence and taking i nto account patient circumstances, implement, document, and monitor.

- **PO3 PROBLEM SLOVING AND DECISION MAKING:**

- Demonstrates the capacity to develop, implement, and evaluate solutions that address pharmacotherapy-related issues and foster the development of evidence-based decision-making abilities.

- **PO4 SOCIAL AND CULTURAL AWARNESS:**

- To ensure the appropriate and safe use of medications throughout society, it is important to acknowledge the social determinants of health and respect the patient's cultural, social, and religious viewpoint. Take into account their experiences, knowledge, values, attitudes, biases, and beliefs to show that you are a self-aware lifelong learner.

- **PO5 PROFESSIONALISM:**

  Demonstrate professional ethics, attitudes and behaviours demonstrating patient advocacy, altruism, responsibility, compassion, honesty and respect for others. Understand, analyze and communicate

the value of their professional roles in society (eg health professionals, health promoters, educators, managers, employers and employees).

- **PO6 INNOVATIONS AND ENTERPRENEURSHIP:** Engage to innovative activities by using creative thinking to evasion better ways of accomplishing professional goals. Utilize the principles of scientific enquiry and critical thinking while solving problems and making decisions in daily practice. Attain the key ability to start a community pharmacy or chain community pharmacies with patient care services.

- **PO7 CONFIDENTIALITY AND PROFESSIONAL ETHICS:**
- Practice moral behavior, protect patient privacy, address medical and professional mistakes, and comprehend the ethics of research. Follow moral guidelines when making decisions and accept accountability for the outcomes.
- **PO8 INTERPERSONAL AND COMMUNICATION SKILLS:**
- Communicate clearly both in writing and orally and adjust to the situation's socioeconomic and cultural nuances. effectively inform patients, families, caregivers, and other medical personnel. Work well in a team and as a consultant to other healthcare team members, regulators, and decision makers.
- **PO9 CLINICAL PHARMACIST AND SOCIETY:**
- Contextual understanding to evaluate the health care needs of the community and evidence of effective planning skills to address concerns regarding the practice of medicine. Patients should be informed about various aspects of health and disease prevention, and they should receive treatment that is reasonably priced.
- **PO10 ENVIRONMENT AND SUSTAINABILITY:**
- Demonstrates knowledge of and a need for sustainable development while comprehending the social and environmental effects of a professional pharmaceutical solution.
- **PO11 PRACTICE BASED LEARNING AND IMPROVEMENT:**
- Examine procedures and therapies, and encourage ongoing development of your patients' experiences and pharmacy services. Display the ability to self-calibrate and a dedication to lifelong learning required to deliver high-quality care. To enhance the quality of care and services, look for, assess, and adopt research evidence. Utilize information, IT, and technology to improve patient care and learning.

M.Pharmacy (Pharmaceutics)

PROGRAM OUTCOMES

- **PO 1 – Scientific knowledge:** Using scientific and technological principles, design and develop effective pharmaceutical dosage forms and drug delivery systems to achieve improved therapeutic outcomes
- **PO 2 – Technological applications:** Leverage technical expertise to assess and identify any factors impacting the quality of pharmaceutical production.
- **PO 3 – Modern tool usage:** Acquire, choose, and implement appropriate methods, procedures, resources, and contemporary pharmacy-related computing tools while being aware of their limitations.
- **PO 4 – Entrepreneurship:** Gain an understanding of the fundamentals of setting up and managing a pharmaceutical enterprise.
- **PO 5 – Practical skills:** Acquire practical skills in formulating and assessing innovative drug release systems for conditions ranging from minor to major diseases.
- **PO 6 – Applied science:** Utilize current scientific knowledge, such as pharmacology and biotechnology, in designing pharmaceuticals centered around specific diseases
- **PO 7 – Computational and statistical methodologies:** Use statistical tools with the help of computer software to optimize formulations and achieve optimal results
- **PO 8 – Pharmaceutical ethics:** Practice personal values and uphold ethical standards in both professional and social situations. Show behavior that acknowledges cultural and personal differences in values, communication, and lifestyle. Utilize ethical frameworks, abide by ethical principles when making decisions, and take responsibility for the consequences of those decisions
- **PO 9 – Environment and sustainability:** Acquire understanding of environmental issues, take measures to protect and preserve biodiversity, and collaborate in efforts to sustain it
- **PO 10 – Life-long learning:** Form the habit of regularly updating knowledge to stay current with industrial demands and societal needs, ensuring a productive and successful career.

M.Pharmacy (Pharmacology)

- **PO 1 Drug Expertise:** To gain knowledge on various classes of drugs and their mechanism of actions to unveil the remedies for many ailments.
- **PO 2 Analytical Reasoning:** Identify assumptions and demonstrate the evidence-based cause of the sickness or disorder to choose the appropriate sort of treatment.
- **PO 3 Experimental Ethics:** Consider and abide by the moral standards and regulations outlined by the authorities of various agencies and government of India for the conduct of animal congenial laboratory practice.
- **PO 4 Interdisciplinary engagement:** Obtain skill oriented practical proficiency by exposing and exploiting the demands of pharmacy in all disciplines to get skill-oriented practical expertise.
- **PO 5 Professional identity:** Be a dedicated and accountable individual to take the initiative, be loyal to the community, and empower society.
- **PO 6 Statistical Skills:** Apply and analyze quantitative measures to obtain dosing safety data, including comparisons of efficacy between experimental arms.
- **PO 7 Intellectual Flexibility:** Engage in critical thinking and gain insight to identify, design and formulate pharmaceutical products that are in need of current aspects by using material from natural sources.
- **PO 8 Lifelong learning:** Understand and apply concepts to everyday activities for one's own benefit and for society and its concerns.

List of Course in B. Pharmacy

S. No.	Course Name	Course Code
	First Year - First Semester	
1	Human Anatomy and Physiology I–Theory	BP101T
2	Pharmaceutical Analysis I – Theory	BP102T
3	Pharmaceutics I – Theory	BP103T
4	Pharmaceutical Inorganic Chemistry – Theory	BP104T
5	Communication skills – Theory *	BP105T
6	Remedial Biology/ Remedial Mathematics – Theory*	BP106RBT BP106RMT
7	Human Anatomy and Physiology – Practical	BP107P
8	Pharmaceutical Analysis I – Practical	BP108P
9	Pharmaceutics I – Practical	BP109P
10	Pharmaceutical Inorganic Chemistry – Practical	BP110P
11	Communication skills – Practical*	BP111P
12	Remedial Biology – Practical*	BP112RBP
	First Year - Second Semester	
13	Human Anatomy and Physiology II – Theory	BP201T
14	Pharmaceutical Organic Chemistry I – Theory	BP202T
15	Biochemistry – Theory	BP203T
16	Pathophysiology – Theory	BP204T
17	Computer Applications in Pharmacy – Theory *	BP205T
18	Environmental sciences – Theory *	BP206T
19	Human Anatomy and Physiology II –Practical	BP207P
20	Pharmaceutical Organic Chemistry I– Practical	BP208P
21	Biochemistry – Practical	BP209P
22	Computer Applications in Pharmacy – Practical*	BP210P

	Second Year - First Semester	
23	Pharmaceutical Organic Chemistry II – Theory	BP301T
24	Physical Pharmaceutics I – Theory	BP302T
25	Pharmaceutical Microbiology – Theory	BP303T
26	Pharmaceutical Engineering – Theory	BP304T
27	Pharmaceutical Organic Chemistry II – Practical	BP305P
28	Physical Pharmaceutics I – Practical	BP306P
29	Pharmaceutical Microbiology – Practical	BP307P
30	Pharmaceutical Engineering –Practical	BP 308P
	Second Year - Second Semester	
31	Pharmaceutical Organic Chemistry III– Theory	BP401T
32	Medicinal Chemistry I – Theory	BP402T
33	Physical Pharmaceutics II – Theory	BP403T
34	Pharmacology I – Theory	BP404T
35	Pharmacognosy and Phytochemistry I– Theory	BP405T
36	Medicinal Chemistry I – Practical	BP406P
37	Physical Pharmaceutics II – Practical	BP407P
38	Pharmacology I – Practical	BP408P
39	Pharmacognosy and Phytochemistry I – Practical	BP409P
	Third Year - First Semester	
40	Medicinal Chemistry II – Theory	BP501T
41	Industrial PharmacyI– Theory	BP502T
42	Pharmacology II – Theory	BP503T
43	Pharmacognosy and Phytochemistry II– Theory	BP504T
44	Pharmaceutical Jurisprudence – Theory	BP505T
45	Industrial PharmacyI – Practical	BP506P
46	Pharmacology II – Practical	BP507P
47	Pharmacognosy and Phytochemistry II – Practical	BP508P
	Third Year - Second Semester	
48	Medicinal Chemistry III – Theory	BP601T
49	Pharmacology III – Theory	BP602T
50	Herbal Drug Technology – Theory	BP603T
51	Biopharmaceutics and Pharmacokinetics – Theory	BP604T
52	Pharmaceutical Biotechnology – Theory	BP605T
53	Quality Assurance –Theory	BP606T
54	Medicinal chemistry III – Practical	BP607P
55	Pharmacology III – Practical	BP608P
56	Herbal Drug Technology – Practical	BP609P
	Fourth Year - First Semester	
57	Instrumental Methods of Analysis – Theory	BP701T
58	Industrial Pharmacy II – Theory	BP702T
59	Pharmacy Practice – Theory	BP703T
60	Novel Drug Delivery System – Theory	BP704T
61	Instrumental Methods of Analysis – Practical	BP705P
62	Practice School*	BP706PS

	Fourth Year - Second Semester	
63	Biostatistics and Research Methodology	BP801T
64	Social and Preventive Pharmacy	BP802T
65	Pharma Marketing Management	BP803ET
66	Pharmaceutical Regulatory Science	BP804ET
67	Pharmacovigilance	BP805ET
68	Quality Control and Standardization of Herbals	BP806ET
69	Computer Aided Drug Design	BP807ET
70	Cell and Molecular Biology	BP808ET
71	Cosmetic Science	BP809ET
72	Experimental Pharmacology	BP810ET
73	Advanced Instrumentation Techniques	BP811ET
74	Dietary Supplements and Nutraceuticals	BP812ET
75	Project Work	BP813PW

List of Course in Pharm.D

	Pharm.D First year	
1	Human Anatomy and Physiology	T1101
2	Pharmaceutics	T1102
3	Medicinal Biochemistry	T1103
4	Pharmaceutical Organic Chemistry	T1104
5	Pharmaceutical Inorganic Chemistry	T1105
6	Remedial Mathematics	T1106
7	Remedial Biology	T1107
8	Human Anatomy and Physiology (Practical)	T1108
9	Pharmaceutics (Practical)	T1109
10	Medicinal Biochemistry (Practical)	T110A
11	Pharmaceutical Organic Chemistry(Practical)	T110B
12	Pharmaceutical Inorganic Chemistry (Practical)	T110C
13	Remidial Biology (Practical)	T110D
14	**Pharm.D Second year**	
15	Pathophysiology	T2101
16	Pharmaceutical Microbiology	T2102
17	Pharmacognosy & Phytopharmaceuticals	T2103
18	Pharmacology-I	T2104
19	Community Pharmacy	T2105
20	Pharmacotherapeutics-I	T2106
21	Pharmaceutical Microbiology (Practial)	T2107
22	Pharmacognosy & Phytopharmaceuticals (Practical)	T2108
23	Pharmacotherapeutics-I (Practical)	T2109
	Pharm.D Third year	
24	Pharmacology-II	T3101
25	Pharmaceutical Analysis	T3102

26	Pharmacotherapeutics-II	T3103
27	Pharmaceutical Jurisprudence	T3104
28	Medicinal Chemistry	T3105
29	Pharmaceutical Formulations	T3106
30	Pharmacology-II(Practical)	T3107
31	Pharmaceutical Analysis (Practical)	T3108
32	Pharmacotherapeutics-II(Practical)	T3109
33	Medicinal Chemistry (Practical)	T3110
34	Pharmaceutical Formulations (Practical)	T3111
	Pharm.D Fourth Year	
35	Pharmacotherapeutics-III	T4101
36	Hospital Pharmacy	T4102
37	Clinical Pharmacy	T4103
38	Biostatistics & Research Methodology	T4104
39	Biopharmaceutics & Pharmacokinetics	T4105
40	Clinical Toxicology	T4106
41	Pharmacotherapeutics-III (Practical)	T4107
42	Hospital Pharmacy (Practical)	T4108
43	Clinical Pharmacy (Practical)	T4109
44	Biopharmaceutics & Pharmacokinetics (Practical)	T4110
	Pharm.D Fifth Year	
45	Clinical Research	T5101
46	Pharmacoepidemiology andPharmacoeconomics	T5102
47	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	T5103
48	Project work (Six Months)	T5104
49	Clerkship	T5105
	Pharm.D Sixth Year	
50	Internship	T6101

List of Course in M. Pharmacy

	M.Pharm (Pharmaceutics) First year First Sem	
1	Modern Pharmaceutical Analytical Techniques	MPH101T
2	Drug Delivery System	MPH102T
3	Modern Pharmaceutics	MPH103T
4	Regulatory Affairs	MPH104T
5	Pharmaceutics Practical I	MPH105T
	M.Pharm (Pharmaceutics) First year Second Sem	
6	Molecular Pharmaceutics (Nano Tech and Target DDS)	MPH201T
7	Advanced Biopharmaceutics & Pharmacokinetics	MPH202T
8	Computer Aided Drug Delivery System	MPH203T
9	Cosmetics and Cosmeticals	MPH204T
10	Pharmaceutical Practical II	MPH205T
	M.Pharm (Pharmaceutics) Second year Third Sem	
11	Research Methodology & Biostatistics	MRM301T
12	Journal club	MRM302T
13	Discussion / Presentation (Proposal Presentation)	MRM303T
14	Research Work	MRM304P
	M.Pharm (Pharmaceutics) Second year Fourth Sem	
15	Journal club	MRM401T
16	Discussion / Presentation (Proposal Presentation)	MRM402T
17	Research Work	MRM403P
	M.Pharm (Ph. Cology) First year First Sem	
1	Modern Pharmaceutical Analytical Techniques	MPA101T
2	Advanced Pharmaceutical Analysis	MPA102T
3	Pharmaceutical Validation	MPA103T
4	Food Analysis	MPA104T
5	Pharmaceutical Analysis Practical I	MPA105P
	M.Pharm (Ph. Cology) First year Second Sem	
6	Advanced Instrumental Analysis	MPA201T
7	Modern Bio-Analytical Techniques	MPA202T
8	Quality control and Quality Assurance	MPA203T
9	Herbal and cosmetic Analysis	MPA204T
10	Pharmaceutical Analysis Practical II	MPA205P
	M.Pharm (Ph. Cology) Second year Third Sem	
11	Research Methodology & Biostatistics	MRM 301T
12	Journal club	MRM302T
13	Discussion / Presentation (Proposal Presentation)	MRM303T
14	Research Work	MRM304P
	M.Pharm (Ph. Cology) Second year Fouth Sem	
15	Journal club	MRM401T
16	Discussion / Presentation (Proposal Presentation)	MRM402T
17	Research Work	MRM403P

1. Course Outcomes of B. Pharmacy First Year – First Semester

S.NO	Course Name with code	Course number	Course outcome
I YEAR I SEMESTER			
1.	**Human anatomy and Physiology-I (Theory) (BP101T)**	**CO1**	**Enumerate the scope of anatomy and physiology, recognize the various homeostatic mechanisms, basic anatomical terms and cellular level organization, characteristics of different types of tissues and their location in the body. (REMEMBER)**
		CO2	**Discuss the structure and functions of skin, bones and joints of human body and skeletal system (UNDERSTAND)**
		CO3	**Illustrate the importance of blood, lymphatic system and immunity in human body. (UNDERSTAND)**
		CO4	**Describe the physiology of sympathetic, parasympathetic, spinal/cranial nerves. (REMEMBER)**
		CO5	**Demonstrate the anatomy and physiology of special senses. (UNDERSTAND)**
		CO6	**Illustrate the importance of cardiovascular system, regulation of blood pressure, pulse, ECG and disorders of heart. (UNDERSTAND)**
2.	Pharmaceutical Analysis I (Theory) (BP102T)	CO1	Describe the techniques of pharmaceutical analysis, use different methods to express concentration, and illustrate the sources of errors in analytical methods and minimize techniques (REMEMBER)
		CO2	Prepare various strengths of primary and secondary solutions and standardize them by various analytical techniques (CREATE)
		CO3	Analyze the compounds by complexometric titration, precipitation titrations & redox titrations (ANALYZE)
		CO4	Illustrate about accuracy, precision and significant figures (UNDERSTAND)
		CO5	Explain different theories in acid, base titrations & non aqueous titrations and demonstrate adequate knowledge on basic principles & theories of various volumetric analytical methods (UNDERSTAND)
		CO6	Assess various electrochemical methods of analysis (EVALUATE)
3.	Pharmaceutics-I (Theory) (BP103T)	CO1	Describe the parts of prescription and remember how to handle the prescription. (REMEMBER)
		CO2	Understand and discuss about different pharmaceutical calculations. (UNDERSTAND)
		CO3	Describe about monophasic liquid dosage forms & remember their preparations. (REMEMBER)
		CO4	Differentiate between monophasic and biphasic liquid dosage forms and analyze different preparation methods. UNDERSTAND)
		CO5	Understand about how pharmaceutical incompatibilities occur and discuss about how to avoid such incompatibilities. UNDERSTAND)
		CO6	Enumerate about semi-solid dosage forms and name their preparation methods. (REMEMBER)
4.	Pharmaceutical Inorganic Chemistry (Theory)	CO1	Interpret the history and concept of Pharmacopoeia and its editions. (UNDERSTAND)
		CO2	Discuss the sources of impurities and methods to determine the impurities in inorganic pharmaceuticals. (UNDERSTAND)

	(BP104T)	CO3	Develop Knowledge on limit tests of different Pharmaceutical inorganic compounds (CREATE)
		CO4	Illustrate the method to prepare Inorganic Pharmaceuticals (UNDERSTAND)
		CO5	Tabulate the Medicinal importance of acidifiers, antacids, cathartics and antimicrobial agents as gastro intestinal agents. (REMEMBER)
		CO6	Demonstrate the handling and applications of radiopharmaceuticals. (UNDERSTAND)
5.	**Communication skills (Theory) (BP105T)**	**CO1**	**Understand the behavioural needs for a pharmacist to function effectively in the areas of pharmaceutical operation. (UNDERSTAND)**
		CO2	**Review effective Communication (Verbal and NonVerbal). (UNDERSTAND)**
		CO3	**Integrate effective management of the team as a team player. (CREATE)**
		CO4	**Interpret Do's and Don'ts of an interview. (UNDERSTAND)**
		CO5	**Categorize and apply communication skills and other interpersonal skills. (ANALYSE)**
		CO6	**Build Leadership qualities and essentials. (CREATE)**
6.	Remedial biology (Theory) (BP106RBT)	CO1	Describe about characters of Living organism and classification of - Five kingdoms. (UNDERSTAND)
		CO2	Discuss About the basic Concept of respiratory system, digestive system, Body fluids and their circulation like blood, lymph, systems of kinetics of food. (UNDERSTAND)
		CO3	Discuss Basic Concept of Excretory products and their elimination, Neural control and coordination, Chemical coordination and regulation, Human reproduction. (UNDERSTAND)
		CO4	Describe about the Introduction to Plants, mineral nutrition and Photosynthesis. (REMEMBER)
		CO5	Describe about Introduction to Plant respiration, Plant growth and development. (REMEMBER)
		CO6	Discuss about the Structure and functions of plant cell, cell organelles, Cell division and Tissues. (REMEMBER)
7.	**Remedial Mathematics (Theory) (BP106RMT)**	**CO1**	**Demonstrate the role of mathematics in pharmacy. (UNDERSTAND)**
		CO2	**Review about theory and their application in pharmacy. (UNDERSTAND)**
		CO3	**Categorize the mathematical tools in the wide professional views and solve problems of trigonometry, calculus and matrices. (ANALYSE)**
		CO4	**Solve the different types of problems by applying theory. (APPLY)**
		CO5	**Generate both conventional and creative techniques to the solutions of mathematical problems. (CREATE)**
		CO6	**Compute a range of techniques effectively to solve problems including theory deduction, approximation and simulation. (APPLY)**
8.	Human Anatomy and Physiology-I (Practical) (BP107P)	CO1	Recall the handling of compound microscope and to memorize the various tissues. (REMEMBER)
		CO2	Summarize the characteristics of different bones (axial and appendicular skeleton) (UNDERSTAND)
		CO3	Analyse the blood cells using haemocytometer. (ANALYSE)
		CO4	Predict the bleeding/clotting time and blood groups. (EVALUATE)
		CO5	Evaluate the haemoglobin concentration of human blood and blood pressure. (EVALUATE)
		CO6	Predict erythrocyte sedimentation rate of human blood and heart rate. (EVALUATE)

9.	Pharmaceutical Analysis I - (Practical) (BP108P)	CO1	Identify the impurities present in compounds by performing limit tests (REMEMBER)
		CO2	Prepare primary and secondary standard solutions of various strengths and standardize them. (CREATE)
		CO3	Calculate the percentage purity of drugs by using volumetric analytical methods.(APPLY)
		CO4	Evaluate the pharmaceutical compounds by acid base titrations, non-aqueous titrations, complex metric, non-aqueous, precipitation and redox titrations (EVALUATE)
		CO5	Determine the normality by electro-analytical methods (APPLY)
		CO6	Understand the principle & reactions involved in various analytical methods (UNDERSTAND)
10.	Pharmaceutics I (Practical) (BP109P)	CO1	Formulate the monophasic internal and external liquid dosage forms.(CREATE)
		CO2	Formulate with biphasic liquid dosage forms. (CREATE)
		CO3	Formulate the solid dosage forms. (CREATE)
		CO4	Formulate the suppositories. (CREATE)
		CO5	Formulate and dispense ointments and semisolid preparations. (CREATE)
		CO6	Formulate and label liquid preparations. (CREATE)
11.	Pharmaceutical Inorganic Chemistry (Practical) (BP110P)	CO1	State the sources of limit tests, Preparation and identification of compounds (REMEMBER)
		CO2	Summarize the preparation of inorganic pharmaceuticals (UNDERSTAND)
		CO3	Compute knowledge to perform modified limit tests (APPLY)
		CO4	Evaluate various inorganic pharmaceutical compounds (EVALUATE)
		CO5	Choose suitable method for the preparation of inorganic pharmaceuticals (APPLY)
		CO6	Justify quality of inorganic pharmaceuticals (EVALUATE)
12.	Communication Skills (Practical) (BP111P)	CO1	Interpret the behavioral needs for a pharmacist to function effectively in the areas of pharmaceutical operation. (UNDERSTAND)
		CO2	Determine the practical skills for effective communication (Verbal and Non-verbal). (APPLY)
		CO3	Characterize pronunciation of vowel and consonant sounds. (ANALYSE)
		CO4	Review advanced learning on comprehension/direct and indirect speech. (UNDERSTAND)
		CO5	Integrate the interview handling skills. (CREATE)
		CO6	Compute in email etiquette. (APPLY)
13.	Remedial biology (Practical) (BP112RBP)	CO1	Explain About Basic Concept Of Microscopes And Permanent Slides(UNDERSTAND)
		CO2	Assess The Cell And Diferent Tisssues Of Plant Parts Microscopic Method Of Evaluation(EVALUATE)
		CO3	Assess The Animal Cell And Tissues By Microscopic Method Of Evaluation(EVALUATE)
		CO4	Demonstration of bones(UNDERSTAND)
		CO5	Analysis of blood Sample ,Blood Pressure (ANALYSIS)
		CO6	Analysis of Lungs (ANALYSIS)

Course Outcomes of B. Pharmacy First Year – Second Semester

S.No	Course Name with code	Course number	Course Outcome
I B. PHARMACY – II SEMESTER (PCI)			
1.	Human anatomy and Physiology II (Theory) (BP201T)	CO1	Explain the basic knowledge about central nervous system including nervous tissue, brain and spinal cord. (UNDERSTAND)
		CO2	Illustrate the structure and functions of gastrointestinal tract and to learn about ATP/CTP/BMR. (UNDERSTAND)
		CO3	Describe about structure and functions of respiratory system and various mechanisms involved in regulation of respiration. (REMEMBER)
		CO4	Categorize the anatomy of urinary system and physiology of urine formation/micturition. (ANALYSE)
		CO5	Identify the essentiality of endocrine glands and their hormones. (REMEMBER)
		CO6	Differentiate the physiology of male and female reproductive organs and concepts of genetics. (ANALYSE)
2.	Pharmaceutical Organic Chemistry-I (Theory) (BP202T)	CO1	Explain the introduction, nomenclature of organic compounds, isomerism, reaction intermediates (UNDERSTAND)
		CO2	Discuss hybridization, preparations and reactions of alkanes, alkadiens(UNDERSTAND)
		CO3	Describe preparations and chemical reactions- electrophilic addition, markonikoff, antimarkonikoff rules, ozonolysis of alkenes (REMEMBER)
		CO4	Discuss preparations, chemical reactions, qualitative tests and stereochemistry of alkyl halides and alcohols (UNDERSTAND)
		CO5	Enumerate preparations and chemical reactions of carbonyl compounds (aldol, crossed aldol, cannizaro, crossed cannizaro, perkin, benzoin condensation reactions) (REMEMBER)
		CO6	Discuss preparations, chemical reactions, identification tests of carboxylic acids and aliphatic amines (REMEMBER)
3.	Biochemistry (Theory) (BP203T)	CO1	Enumerate the classification, properties, significance and metabolic reactions of carbohydrates, lipids, nucleic acids, proteins and amino acids (REMEMBER)
		CO2	Understand the metabolism of carbohydrates and process of electron transport and ATP formation. (UNDERSTAND)
		CO3	Discuss the metabolism of nucleic acids, lipids and amino acids. (UNDERSTAND)
		CO4	Appraise the causes, manifestations and diagnosis of metabolic Disorders. (EVALUATE)
		CO5	Determine the process of DNA replication, transcription and Translation. (APPLY)
		CO6	Apply the concept of catalytic activity and enzyme inhibition in design of new drugs, diagnostic and therapeutic applications of enzyme. (APPLY)
4.	Pathophysiology (Theory) (BP204T)	CO1	Describe basic aspects of cell injury and adaptation, along with feedback mechanisms and homeostasis. (REMEMBER)
		CO2	Explain the role of chemical mediators in inflammation and healing mechanism, along with biological effects of radiation on cell. (UNDERSTAND)

		CO3	Identify the cause and pathophysiology of common diseases associated with cardiovascular system, respiratory system and renal system (REMEMBER)
		CO4	Explain the pathophysiology associated with the endocrine system, nervous system, gastrointestinal system and haematological diseases. (UNDERSTAND)
		CO5	Describe the principles of pathophysiology involved in cancer and common diseases of bone and joints along with the pathophysiology of inflammatory bowel diseases based on its types, and pathology of jaundice involved in hepatitis (A, B, C, D, E, F) and alcohol liver diseases. (REMEMBER)
		CO6	Identify the causative organism and pathophysiology involved in common infectious diseases like meningitis, typhoid, leprosy and tuberculosis, and common sexually transmitted diseases like Acquired Immune Deficiency syndrome, syphilis and gonorrhoea. (REMEMBER)
5.	Computer Applications in Pharmacy (Theory) (BP205T)	CO1	Illustrate the concept of number system in computers. (UNDERSTAND)
		CO2	Describe use of web technologies such as HTML, XML, CSS, Programming languages, Web servers and pharmacy drug database. (REMEMBER)
		CO3	Discuss about different types of databases, applications of computers and databases in pharmacy. (UNDERSTAND)
		CO4	Appraise the applications of computers in pharmacy such as drug information services, pharmacokinetics, mathematical model in drug design, hospital and clinical pharmacy etc., (EVALUATE)
		CO5	Explain about bioinformatics and its impact in vaccine discovery and database. (UNDERSTAND)
		CO6	Analyses computers as data analysis in preclinical development. (ANALYSE)
6.	Environmental sciences (Theory) (BP206T)	CO1	Describe fundamental knowledge on environment and its associated problems. (REMEMBER)
		CO2	Explain the natural, renewable and non-renewable resources and its allied problems.(UNDERSTAND)
		CO3	Enumerate the structure and functions of ecosystem. (REMEMBER)
		CO4	Discuss about the introduction, types, characteristic features, structure and functions of ecosystems. (UNDERSTAND)
		CO5	Develop attitude of concern regarding environmental pollution like air pollution, water pollution and soil pollution. (CREATE)
		CO6	Assess the problems caused due to environmental pollution. (EVALUATE)
7.	Human Anatomy and Physiology-II (Practical) (BP207P)	CO1	Demonstrate the knowledge on coordinating working of organs of various systems and the physiology of special senses with the help of models, charts, and specimens. (UNDERSTAND)
		CO2	Analyze the function of cranial nerves by various sensory and motor function. (ANALYSE)
		CO3	Determine the general neurological Examinations. (APPLY)
		CO4	Evaluate Body Temperature and Body Mass Index. (EVALUATE)
		CO5	Calculate Tidal volume and Vital Capacity and to develop the knowledge on systems with the help of charts and specimens. (APPLY)
		CO6	Appraise the knowledge on Family planning devices, pregnancy, diagnostic tests and tissues of vital organs and gonads. (EVALUATE)

8.	Pharmaceutical Organic Chemistry-I (Practical) (BP208T)	CO1	Perform the systematic qualitative analysis of unknown organic compound by preliminary tests, extra elemental tests, functional group tests, preparation of their derivatives and Melting point/Boiling point of organic compounds (CREATE & EVALUATE)
		CO2	Perform the systematic qualitative analysis of unknown organic compound by preliminary tests (CREATE & EVALUATE)
		CO3	Perform the systematic qualitative analysis of unknown organic compound by extra elemental tests (CREATE & EVALUATE)
		CO4	Perform the systematic qualitative analysis of unknown organic compound by, functional group tests, preparation of their derivatives and Melting point/Boiling point of organic compounds (CREATE & EVALUATE)
		CO5	Preparation of suitable sold derivatives from organic compounds (CREATE & EVALUATE)
		CO6	Construction of molecular models using ball and stick molecular models (CREATE)
9.	Biochemistry – Practical (BP209P)	CO1	Remember the qualitative analysis of carbohydrates and proteins. (REMEMBER)
		CO2	Understand the principle and clinical significance of blood glucose (UNDERSTAND)
		CO3	Identify the amount of reducing sugars by DNSA method and preparation of buffers (REMEMBER)
		CO4	Analyze the constituents present in Urine and their clinical significance (ANALYZE)
		CO5	Determine the effect of temperature and substrate concentration on salivary amylase activity (APPLY)
		CO6	Evaluate the clinical significance of creatinine, proteins and cholesterol in blood (EVALUATE)
10.	Computer Applications in Pharmacy (Practical) (BP210P)	CO1	Demonstrate and make use of MS Word suite and concepts of information systems and software. (UNDERSTAND)
		CO2	Summarize the report and to design a web page Using HTML and drug information system. (UNDERSTAND)
		CO3	Explain the adverse effects using online tools and paradigms of program languages and be exposed to at least one database(SQL) (UNDERSTAND)
		CO4	Create and make use of MS Access suite and bioinformatics (CREATE)
		CO5	Determine the knowledge of computers in pharmacy, web and XML pages (APPLY)
		CO6	Design and make use of MS Excel and Power point suite and preclinical development. (CREATE)

1.3 Course Outcomes of B. Pharmacy Second Year – First Semester

S.NO	Course Name with code	Course Number	Course outcome
II Year B. Pharmacy I Semester (PCI)			
1	Pharmaceutical Organic Chemistry-II (Theory)	CO1	Illustrate the aromaticity, chemistry and reactions of benzene. To gain knowledge on structure and medicinal uses of pharmaceutical organic compounds. (UNDERSTAND)
		CO2	Describe the chemistry of phenols, aromatic amines and aromatic acids (UNDERSTAND)

	(BP301T)	CO3	Enumerate the concept of hydrolysis, hydrogenation, saponification and rancidity of oils and also to estimate the analytical constants of fats and oils (REMEMBER)
		CO4	Summarize the synthesis and reactions of poly-nuclear hydrocarbons (CREATE)
		CO5	Understand the reactions and stability concepts of cycloalkanes (CREATE)
		CO6	Summarize the reactions of cycloalkanes likecyclcopropane and cyclobutene (REMEMBER)
2	Physical Pharmaceutics-I (Theory) (BP302T)	CO1	Demonstrate principles involved, applications of solubility from solids in liquids, liquids in liquids, gas in liquids and Distribution of drugs.(UNDERSTAND)
		CO2	Enumerate different states of matters and their conversion from one form to other along withcrystallinity and polymorphism. (REMEMBER)
		CO3	Characterize various physicochemical properties of drugs which helps to utilize indevelopment, evaluations of pharmaceutical formulations. (ANALYSE)
		CO4	Determine surface and interfacial tension at different kinds of interfaces and their applicability in pharmaceutical developments. (APPLY)
		CO5	Relate the knowledge on complexation and protein binding in pharmaceuticaldevelopments.(ANALYSE)
		CO6	Summarize the importance of buffers, Isotonic solutions and its measurement, adjustment methods in development andevaluations of pharmaceuticals.(UNDERSTAND)
3	Pharmaceutical Microbiology (Theory) (BP303T)	CO1	Demonstrate about importance of Microbiology & its branches, Prokaryotes and Eukaryotes, ultra-structure and morphological classification of bacteria, nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve, isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count),differenttypes of phase constrast microscopy, dark field microscopy and electron microscopy.(UNDERSTAND)
		CO2	Describe and Identify The concept of Identification of bacteria using staining techniques, biochemical tests (IMViC), sterilization and Evaluation of sterilizationmethods and Sterility indicators. (REMEMBER)
		CO3	Summarise and Explain about the Fungi and Viruses and mode of action and evaluation of disinfectants, antiseptics, bacteriostatic and bactericidal actions, Sterility testing of productsaccording to IP, BP, USP (UNDERSTAND)
		CO4	Describe About aseptic area, sources of contamination and methods of prevention, cleanarea classification, microbiological assay, Methods for standardization of antibiotics, vitamins and amino acids, Assessment of a new antibiotic. (REMEMBER)
		CO5	Explain about Types of spoilage, sources, microbial contaminants, assessment of microbialcontamination and spoilage, Preservation of pharmaceutical products using antimicrobial agents, microbial stability of formulations. (UNDERSTAND)
		CO6	Discuss about concept, general procedure, application of animal cells in culture. (UNDERSTAND)
4	Pharmaceutical Engineering-Theory (BP 304T)	CO1	Describe and define the principles andmethodology of various unit operation processes and its application in pharmaceutical industry. Theories and basic mechanisms involved in flow of fluids; understand principle,construction and working of equipment used in flow of fluids. (UNDERSTAND)

		CO2	Enumerate the importance of unit operations in pharmaceutical manufacturing, importance ofsize reduction, powder size and size separation, principle, construction and working of equipment used in size reduction and size separation.(REMEMBER)
		CO3	Understand mechanism of flow of heat, laws ofheat transfer and principle, construction and working of heat exchangers and heat interchangers, learn merits and demerits of equipment used. Explain and understand importance of evaporation and distillation. Understand, recall remember principle construction and working of various evaporators,understand various types of distillation and their principle and mechanism. (UNDERSTAND AND REMEMBER).
		CO4	Understand drying process, recall, understand and remember theories of drying, determine rate of drying and merits and demerits of various dryers. Develop knowledge of unit operation mixing, theories as well as basic mechanisms; understand principle, constructionand working of equipment used in mixing. (UNDERSTAND, REMEMBER AND CREATE)
		CO5	Summarize concepts and methods of filtration and centrifugation during pharmaceutical manufacturing. Understandprinciple, construction and working of equipment used in filtration and centrifugation. (UNDERSTAND)
		CO6	Comprehend selection of type of equipment used in unit operations during pharmaceuticalmanufacturing and logic behind selection; develop knowledge and skill of designing a proper comprising of set of equipment for various unit operations for quality result. To choose various preventive methods used for corrosion control in pharmaceutical industries.(ANALYSE AND APPLY)
5	Pharmaceutical Organic Chemistry-II Practical (BP305P)	CO1	Experiments involving laboratory techniquesRecrystallization (CREATE & EVALUATE)
		CO2	Experiments involving laboratory techniquesSteam distillation (CREATE & EVALUATE)
		CO3	Determination of following oilvalues (including standardization of reagents) Acid value, Saponification value, Iodine value (CREATE & EVALUATE)
		CO4	Preparation of compounds • Benzanilide/Phenylbenzoate/Acetanilide from Aniline/Phenol /Aniline by acylation reaction. • 2,4,6-Tribromo aniline/Para bromoacetanilide from Aniline/ • Acetanilide by halogenation(Bromination) reaction. 5-Nitro salicylic acid/Meta di nitro benzenefrom Salicylic acid / Nitro benzene by nitration reaction. (CREATE & EVALUATE)
		CO5	Preparation of compounds • Benzoic acid from Benzyl chloride byoxidation reaction. • Benzoic acid/ Salicylic acid from alkyl benzoate/ alkyl salicylate by hydrolysisreaction. • 1-Phenyl azo-2-napthol from Aniline by diazotization and coupling reactions. Benzil from Benzoin by oxidation reaction (CREATE &EVALUATE)
6	Physical pharmaceutics -I	CO1	Determine solubility of a drug (APPLY)
		CO2	Determine Partition coefficient of a drug (APPLY)

	Practical (BP306P)	CO3	Construct phase diagram of phenol water systemand to determine concentration of impurities present in this system. (CREATE)
		CO4	Compute CMC and HLB value of surfactants.(APPLY)
		CO5	Calculate surface tension of liquids by drop weight and drop count methods (APPLY)
		CO6	Evaluate Adsorption rate constants and to determine complexations by different methods.(EVALUATE)
7	Pharmaceutical Microbiology-Practical (BP307P)	CO1	Introduction and demonstration of different equipments like B.O.D. incubator, laminar flow,aseptic hood, autoclave, hot air sterilizer, deep freezer. (Understand)
		CO2	Demonstrate sterilization of glassware, preparation and sterilization of media. Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations (Understand)
		CO3	Determine Staining methods- Simple, Grams staining and acid fast staining (Apply)
		CO4	Prepare Isolation of pure culture of micro- organisms by multiple streak plate technique andother Techniques (Create)
		CO5	Develop microbiological assay of antibiotics bycup plate method and other methods, motility determination by Hanging drop method.(Create)
		CO6	Evaluate Sterility testing of pharmaceuticals. Bacteriological analysis of water, biochemicaltest. (Evaluate)
8	Pharmaceutical engineering-Practical (BP308P)	CO1	Determination of radiation constant of brass, iron, unpainted and painted glass. To determinethe overall heat transfer coefficient by heat exchanger. Steam distillation – To calculate theefficiency of steam distillation (APPLY)
		CO2	Verify the laws of size reduction using ball mill and power requirementand critical speed of Ball Mill. Size analysis by sieving – To evaluate size distribution of tablet granulations (EVALUATION)
		CO3	Construction of drying curves (for calciumcarbonate and starch). Determination of moisture content and loss on drying. Determination of humidity of air – i) From wetand dry bulb temperatures –use of Dew point method and equipment's rotary. tablet machine, fluidized bed coater, fluid energy mill, dehumidifier (Create)
		CO4	Demonstration of colloid mill, planetary mixer, fluidized bed dryer, freeze dryer and other major equipment (UNDERSTAND)
		CO5	Study the effect of time on the Rate of Crystallization. To calculate the uniformity index for given sample by using Double ConeBlender. (APPLY)
		CO6	Enumerate the. Factors affecting Rate of Filtrationand Evaporation (REMEMBER)

3.2. Course Outcomes of B. Pharmacy Second Year – Second Semester

S.No	Course name with code	Course number	Course outcome
II YEAR B. PHARMACY – II SEMESTER (PCI)			
1	Pharmaceutical organic	CO1	Discuss the fundamentals of stereo chemical aspects like optical isomerism-optical activity,enantiomers, Diastereo-isomerism and meso-compounds.(UNDERSTAND)

	chemistry-III (Theory) (BP401T)	CO2	Understand knowledge on Geometrical andconformational isomers, stereoisomerism in biphenyl compounds and their related aspects. (UNDERSTAND)
		CO3	Enumerate the nomenclature, properties andmethods of preparation of heterocyclic compounds.
		CO4	Summarize concept of synthesis, reactions, medicinal uses of few heterocyclic compounds and their derivatives. (UNDERSTAND)
		CO5	Illustrate the oxidation and reduction reactionsof synthetic importance like Metal hydride reductions, Birch reductions etc. (UNDERSTAND)
		CO6	Illustrate the rearrangement and condensationreactions of synthetic importance like Beckmanns rearrangement, Claisen Schmidt Condensation. (UNDERSTAND)
2	Medicinal chemistry-I (Theory) (BP402T)	CO1	Recall the knowledge on History and development of medicinal chemistry, physicochemical properties in relation to biological action And Drug metabolism. (REMEMBER)
		CO2	Illustrate the concept of Biosynthesis, catabolism of catecholamine's and adrenergicreceptors and their distribution, To illustrate theClassification, Structure activity relationship andMechanism of action of Adrenergic agents. (UNDERSTAND)
		CO3	Explain the biosynthesis of cholinergic agents,catabolism of acetylcholine and cholinergic receptors and their distribution. (UNDERSTAND)
		CO4	Discuss about the Classification, Structure activity relationship and Mechanism of action ofCholinergic drugs. (UNDERSTAND)
		CO5	Summarize the Classification, Structure activityrelationship, mechanism of action and synthesis of Few classes of Drugs acting on CNS (sedative&hypnotics, anti-psychotics,anti-convulsants)(UNDERSTAND)
		CO6	Describe the concept of Classification, Structureactivity relationship mechanism of action and synthesis of Few classes of Drugs acting onCentral nervous system (General anaesthetics, narcotic antagonists, anti-inflammatory agents) (REMEMBER)
3	Physical Pharmaceutics-II (Theory) (BP403T)	CO1	Demonstrate the classification and properties of dispersion systems of colloids and the effectof electrolytes. Classify various colloid systems, types, properties and evaluation.(UNDERSTAND)
		CO2	Describe Newtonian and non-Newtonian systems and determine viscosity of a system using various viscometers. Identify the effect ofthixotropy in formulation.(REMEMBER)
		CO3	Explain the coarse dispersions, differentiatevarious suspensions and emulsions, understand the theories of emulsification, prepare andevaluate. (UNDERSTAND AND EVALUATE)
		CO4	Summarize the significance of particle sizeand distribution in a formulation and to determine micromeritic properties and their applications.(UNDERSTAND AND APPLY)
		CO5	Determine the kinetic rates, order of reaction, decomposition pathways and methods of stabilization (APPLY)
		CO6	Assess the significance of stability testingmethods, accelerated stability studies. (EVALUATE)
4	Pharmacology-I (Theory) (BP404T**)**	CO1	Discuss the general principles and fundamental concepts of pharmacology and Pharmacokinetics. (UNDERSTAND)
		CO2	Summarize the basics of pharmacodynamics, Adverse reactions, drug interactions and drugdiscovery. (UNDERSTAND)

		CO3	Identify the role of neuro humoral transmission and drugs acting on Peripheral nervous system and Neuromuscular blocking agents, Local anaesthetics and disorders of PNS (REMEMBER)
		CO4	Analyse the functions of neurotransmitters anddrugs acting on central nervous System, alcohol & disulfiram. (ANALYSE)
		CO5	Appraise the pharmacology of psychopharmacological agents and to predict the effects of drugs against neurodegenerative Disorders. (EVALUATE)
		CO6	Demonstrate the concepts of opioids and drug addiction/abuse/tolerance/ dependence. (UNDERSTAND)

5	Pharmacognosy and phytochemistry -I (Theory) (BP405T)	CO1	Describe basics of Pharmacognosy, Sources ofDrugs, Organized drugs, unorganized drugs, Classification of drugs, Quality control of Drugs of Natural Origin (UNDERSTAND)
		CO2	Discuss the Concept of Cultivation, Collection,Processing and storage of drugs of natural origin and Conservation of medicinal plants (UNDERSTAND)
		CO3	Demonstrate the Plant tissue culture and their Applications of plant tissue culture in pharmacognosy and Edible vaccines (UNDERSTAND)
		CO4	Assess the importance of various systems of medicine in Pharmacognosy and describe aboutthe Ayurveda, Unani, Siddha, Homeopathy and Chinese systems of medicine (EVALUATE).
		CO5	Describe basic Introduction to secondarymetabolites like Alkaloids, Glycosides, Flavonoids, Tannins,Volatile oil and Resins. (REMEMBER)
		CO6	Describe the Plant Products like Fibers, Hallucinogens, Teratogens, Natural allergens Primary metabolites, General introduction, detailed study with respect to chemistry, sources,preparation, evaluation, preservation, storage, therapeutic used and commercial utility as Pharmaceutical Aids and/or Medicines for the following Primary metabolites likeCarbohydrates, Proteins and Enzymes, Lipids,Marine Drugs.(REMEMBER)
6	Medicinal Chemistry -I (Practical) (BP406P)	CO1	Recall the basic Techniques involved inpreparation of drugs/ intermediates (REMEMBER)
		CO2	Synthesize and B about purificationsteps in medicinal compounds (CREATE)
		CO3	Demonstrate techniques in characterization of drugs (UNDERSTAND & ANALYSE)
		CO4	Analyse the amount of drug in dosage form byusing various analytical techniques. (ANALYSE)
		CO5	Determine the percentage purity of variousdosage forms. (APPLY)
		CO6	Determination of impact of physicochemical properties in relation to biological activity by performing partition co-efficient studies. (EVALUATE)
7	Physical Pharmaceutics-II(Practical) (BP407P)	CO1	Determination of derived Properties of powdersusing different methods. (APPLY)
		CO2	Determination of flow Properties of powdersusing different methods. (APPLY)
		CO3	Determination of Rheological studies bydifferent methods. (APPLY)
		CO4	To conclude the effect of suspending agents inthe product formulation. (EVALUATE)
		CO5	Interpretation of Rate order kinetics(UNDERSTAND)

		CO6	Evaluation of stability of Drugs at different temperatures.(EVALUATION)
8	Pharmacology-I(Practical) (BP408P)	CO1	Enumerate about basic instruments, common laboratory animals used in experimental pharmacology and to organize animal house as per the CCSEA guidelines. (REMEMBER)
		CO2	Demonstrate the common laboratory techniques like routes of administration, blood withdrawal, anesthetics and euthanasia used for animal studies. (UNDERSTAND)
		CO3	Determine the effects of various drugs on rabbit eye and ciliary motility of frog esophagusin correlation with humans. (APPLY)
		CO4	Analyze the effect of drugs acting as enzyme inducers, skeletal muscle relaxants and affectinglocomotor activity in laboratory animals. (ANALYZE)
		CO5	Evaluate the stereotype and anticatatonic activity of drugs in rats/mice. (EVALUATE)
		CO6	Predict various screening models for anticonvulsant and anxiolytic activity.(EVALUATE)
9	Pharmacognosy and Phytochemistry -I (Practical) (BP409P)	CO1	Introduction (UNDERSTAND)
		CO2	Asses The Crude Drugs by Chemical Test (ANALYSE)
		CO3	Assess The Leaf Constants by Microscopic Method of Evaluation (EVALUATE)
		CO4	Assess The Cell Constituents by Microscopic Method of Evaluation (EVALUATE)
		CO5	Evaluation of Crude Drugs by Quantitative Method (EVALUATE)
		CO6	Evaluation of the Crude Drugs by Physical Method of Evaluation (EVALUATE)

Course Outcomes of B. Pharmacy Third Year – First Semester

S.NO	Course Name with code	Course number	Course outcome
– III YEAR B.PHARMACY I SEMESTER (PCI)			
1	Medicinal Chemistry-II (Theory) (BP501T)	CO1	Discuss about the classification, structures, M.O.A and synthesis of drugs specified in antihistamines and anticancer drugs. (UNDERSTAND)
		CO2	Illustrate the concept of mechanisms in mode of action and chemistry involved in anti-anginal, Antihypertensive and diuretics drugs (UNDERSTAND)
		CO3	Explain the mechanism of cardiac action potential for better understanding of cardiovascular drugs, describe about structure, synthesis, metabolic aspects, therapeutic uses and adverse effects of antiarrhythmic and cardio tonics. (UNDERSTAND)
		CO4	Describe the pathways in blood coagulation and define antihyperlipidemics and anticoagulants and understand the M.O.A, structure and synthesis of specified drugs. (REMEMBER)
		CO5	Discuss about the rules in nomenclature, metabolism and stereochemistry of steroids and endocrine drugs. (UNDERSTAND)
		CO6	Summarize the Classification, Structure activity relationship, mechanism of action and Synthesis of specified drugs in local anaesthetics. (UNDERSTAND)
		CO7	Describe the concept of Classification, mechanism of action and Synthesis of specified drugs in oral hypoglycemic agents (REMEMBER)

2	Industrial Pharmacy-I (Theory) (BP502T)	CO1	Illustrate pre formulation parameters, physical chemical properties and their application for development of solid, liquid and parenteral dosage form along with BCS classification. (UNDERSTAND)
		CO2	Develop tablet formulation by using granulation methods, methods of tablet coating along with quality control tests and liquid orals preparation and evaluation. (CREATE)
		CO3	Design the methods used for preparation of soft and hard gelatin capsules and pellets along with the quality control tests, packaging and storage of these preparations. (CREATE)
		CO4	Build essential requirements for formulation of parenteral products and opthalmics along with the quality control tests, Labelling, packaging and storage. (CREATE)
		CO5	Develop different types of cosmetics and pharmaceutical aerosols with quality control tests and stability studies. (CREATE)
		CO6	Demonstrate the kind of material, choice of containers used for packaging of pharmaceutical products. (UNDERSTAND)
3	Pharmacology–II (Theory) (BP503T)	CO1	Identify and describe various drugs, their benefits and risks for use in various cardiac complications. (REMEMBER)
		CO2	Elucidate and differentiate the drugs that have effects on blood and blood formation, shock, and those drugs used as diuretics and anti-diuretics. (UNDERSTAND)
		CO3	Illustrate various autocoids, their classification and roles, and to identify drug groups relating to the autocoid. (UNDERSTAND)
		CO4	Characterize the endocrine system, its hormones and categorize different drugs acting on endocrine system. (ANALYSE)
		CO5	Classify various sex hormones and their physiological roles, and to identify the effects of oral contraceptives and drugs acting on the uterus. (ANALYSE)
		CO6	Appraise the principles of bioassay, its applications, and to Justify the bioassay design and methods for some compounds. (EVALUATE)
4	Pharmacognosy and Phytochemistry-II (Theory) (BP504T)	CO1	Describes the basic metabolic pathways and their determination in higher plants, utilization of radioactive isotopes in the investigation of Biogenetic studies. (REMEMBER)
		CO2	Summarizes the introduction, composition, chemistry & chemical classes, biosources, therapeutic uses and commercial applications of secondary metabolites like Alkaloids, Steroids, Volatile oils. (UNDERSTAND)
		CO3	Explains the introduction, composition, chemistry & chemical classes, biosources, therapeutic uses and commercial applications of secondary metabolites likeTannins, Resins, Glycosides. (UNDERSTAND)
		CO4	Describes the Isolation, Identification and Analysis of Phytoconstituents of Alkaloids, Terpenoids, Glycosides, Resins. (REMEMBER)
		CO5	Explains the Industrial production, estimation and utilization of various phytoconstituents. (UNDERSTAND)
		CO6	Describes the basics of Phytochemistry, Modern methods of extraction, application of latest techniques like Spectroscopy, chromatography and electrophoresis in the isolation, purification and identification of crude drugs. (REMEMBER)
5	Pharmaceutical Jurisprudence (Theory) (BP505T)	CO1	Describe the schedules and provisions given under Drugs and Cosmetics act 1940 and its rules 1945 (UNDERESTAND)
		CO2	Apply the provisions of Pharmacy act 1948 and procedure for registration of pharmacist and to describe constitution and functions of PCI and State Pharmacy councils (APPLY)
		CO3	List out the provisions under medicinal and toilet preparations act,

			narcotic drugs and psychotropic substances act and rules (REMEMBER)
		CO4	Discuss the salient features of drugs and magic remedies act and rules and Prevention of cruelty to animals' act 1960 (UNDERESTAND)
		CO5	Illustrate the importance of National drug pricing authority and to recall the pharmaceutical legislations in India and code of pharmaceutical ethics (UNDERESTAND)
		CO6	Explain about the medical termination of pregnancy act, right to information act and IPR (UNDERESTAND)
6	Industrial Pharmacy-I (Practical) (BP506P)	CO1	Determine pre formulation studies on different types of drugs. (APPLY)
		CO2	Formulate and evaluate different types of tablets. (CREATE, EVALUATE)
		CO3	Formulate and evaluate different types of capsules. (CREATE, EVALUATE)
		CO4	Develop parenteral dosage forms and different types of ophthalmic products. (CREATE)
		CO5	Prepare different types of cosmetic preparations. (CREATE)
		CO6	Evaluate the glass containers as per Indian Pharmacopoeia (EVALUATE)
7	Pharmacology–II (Practical) (BP507P)	CO1	Illustrate and understand the importance of physiological salt solutions and to elucidate the effect of some drugs on isolated frog heart, blood pressure and heart rate of dog. (UNDERSTAND)
		CO2	Demonstrate and illustrate the diuretic activity of drugs in mice or rats. (UNDERSTAND)
		CO3	Appraise the dose-response relationship (DRC), effect of drugs on DRC and to design drug concentrations by various bioassay methods using animal simulator software. (EVALUATE)
		CO4	Designate PA2 and PD2 value of drugs using rat anococcygeus muscle and guinea pig ileum. (CREATE)
		CO5	Identify and elucidate the effect of spasmogens and spasmolytics using rabbit jejunum. (REMEMBER)
		CO6	Compute some screening models and approaches for studying analgesic and anti-inflammatory activities. (APPLY)
8	Pharmacognosy and Phytochemistry-II (Practical) (BP508P)	CO1	Illustrate the morphology, histology and powder characteristics & extraction & detection of: Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel and Coriander (UNDERSTAND)
		CO2	Prepare the Isolation & detection of active principles from a. Caffeine - from tea dust. b. Diosgenin from Dioscorea c. Atropine from Belladonna d. Sennosides from Senna (CREATE)
		CO3	To prepare and differentiate separation of sugars by Paper chromatography (ANALYSE)
		CO4	Determine TLC of herbal extract (APPLY)
		CO5	Demonstrate and rearrange distillation of volatile oils and detection of phyto-constitutents by TLC (UNDERSTAND)
		CO6	Classify Analysis of crude drugs by chemical tests (ANALYSE)

3.2. Course Outcomes of B. Pharmacy Third Year – Second Semester

S.NO	Course Name with code	Course number	Course outcome
III YEAR B.PHARMACY – II SEMESTER (PCI)			
1	Medicinal Chemistry-III	CO1	Recall the knowledge on History and development of antibiotics and focus on chemistry and degradation reactions and SAR of beta lactam

	(Theory) (BP601T)		antibiotics and tetracyclines. (REMEMBER)
		CO2	Illustrate, explain Classification, Structure activity relationship, stereochemistry and Mechanism of action of aminoglycosides, macrolides. (UNDERSTAND)
		CO3	Explain etiology of malaria, structure, SAR of antimalarials and identify the mechanism of action and therapeutic uses of drugs, To choose the synthetic route for selected category of antimalarial and pro drugs (UNDERSTAND)
		CO4	Illustrate, explain Classification, Structure activity relationship, and Mechanism of action and synthesis of anti-tb, urinary anti- infectives, and antiviral drugs (UNDERSTAND)
		CO5	Summarize the Classification, Structure activity relationship and Mechanism of action, adverse effects and synthesis of antifungals, anti-amoebic, anti-fungal, antihelmenthic, and sulphonamides (UNDERSTAND)
		CO6	Discuss about the approaches in drug design like QSAR, pharmacophore modelling, Docking.(UNDERSTAND)
		CO7	Describe the concept and applicaions of combinatorial chemistry and various techniques used in synthesis of library of compounds. (REMEMBER)
2	Pharmacology–III (Theory) (BP602T)	CO1	Describe the various drug classes used for different respiratory system health conditions and elucidate their mechanism of action. (REMEMBER)
		CO2	Identify drugs used for gastrointestinal tract complications and study some pharmacological aspects of these drugs. (REMEMBER)
		CO3	Review the general principles of chemotherapy and understand the mechanism of action of some antibiotics. (UNDERSTAND)
		CO4	Assess the mechanism of action for anti-mycobacterial, antifungal, anti-viral, anti-helminthic, anti-malaria drugs and their classification. (EVALUATE)
		CO5	Categorize and analyze the chemotherapy of UTIs, STDs and anti-cancer drugs, and to identify drugs utilized in immune pharmacology. (ANALYSE)
		CO6	Discuss the principles of toxicology, and assess aspects of mutagenicity, genotoxicity, carcinogenicity & teratogenicity, and to comprehend the body’s biological rhythm & clock, illustrating its importance in chronotherapy. (UNDERSTAND)
3	Herbal drug technology (Theory) (BP603T)	CO1	Describes herbs as raw materials, Selection, identification and authentication of herbal materials Processing of herbal raw material. The basic principles involved in Ayurveda, Siddha, Unani and Homeopathy, Preparation and standardization of Ayurvedic formulations viz Aristas and Asawas, Ghutika, Churna, Lehya and Bhasma. (REMEMBER)
		CO2	Explains the General aspects, Market growth, scope and types of products available in the market. Healthbenefits and role of Nutraceuticals in ailments like Diabetes, CVS diseases, Cancer, Irritable bowel syndrome and various Gastro intestinal diseases. (UNDERSTAND)
		CO3	Differentiates and explains aboutGeneral introduction to interaction and classification. Study of drugs and their possible side effects and interactions. (UNDERSTAND)
		CO4	Explains the Sources and description of raw materials of herbal origin in products such as skin care, hair care and oral hygiene, Significance of substances of natural origin as excipients Conventional herbal formulations like syrups, mixtures and tablets and Novel dosage forms like phytosomes. (UNDERSTAND)

		CO5	Describes evaluation of Drugs WHO & ICH guidelines for the assessment of herbal drugs,Stability testing of herbal drugs. Patenting and Regulatory requirements of natural products: Regulatory Issues. (REMEMBER)
		CO6	Enumerates brief account of plantbased industries and institutions involved in work on medicinal and aromatic plants in India. Schedule T– Good Manufacturing Practice of Indian systems of medicine. (REMEMBER)
4	Biopharmaceutics and Pharmaccokinetics (Theory) (BP604T)	CO1	Recall basic concepts of absorption and distribution of drugs. (REMEMBER)
		CO2	Explain the mechanisms; interpret various factors affecting drug metabolism and excretion of drugs. (UNDERSTAND)
		CO3	Design the bioavailability testing protocol of a drug and compare the bioequivalence between marketed products. (CREATE) (UNDERSTAND)
		CO4	Apply the pharmacokinetic models like one compartment and also non compartment models for the determination of pharmacokinetic parameters. (APPLY)
		CO5	Choose the multi compartment models for the determination of pharmacokinetic parameters of a drug. (APPLY)
		CO6	Evaluate various pharmacokinetic parameters for the drugs exhibiting saturation kinetics. (EVALUATE)
5	Pharmaceutical Biotechnology (Theory) (BP605T)	CO1	Describe the basic concepts of biotechnology with respect to enzyme technology, immunology, microbial technology, genetic engineering and protein engineering. (REMEMBER)
		CO2	Explain the steps involved in development of biosensors, recombinant products and concepts of immunology. (UNDERSTAND)
		CO3	Explain the production parameters important in pharmaceutical product development using principles of biotechnology. (UNDERSTAND)
		CO4	Differentiate the genetic organization of different types of cells and to list detection methods at genomic level, gene transfer methods and mutagens. (ANALYSE)
		CO5	Explain general requirements of fermentative production and biotechnological production of pharmaceuticals. (UNDERSTAND)
		CO6	Discuss on microbial genetics, biotransformation and various immunological products. (UNDERSTAND)
6	Quality Assurance (Theory) (BP606T)	CO1	Describe the concept of GMP and TQM also list out the responsibilities of QA & QC Departments. (UNDERSTAND)
		CO2	Explain about the personnel, equipment and materials in a pharmaceutical laboratory or industry. (UNDERSTAND)
		CO3	List Out the various evaluation studies for the packing materials also explained about the GLP. (REMEMBER) (UNDERSTAND)
		CO4	Apply the procedure for giving complaints while dealing with pharmaceuticals. (APPLY)
		CO5	Choosing of or following of various documentation the pharmaceutical industry during manufacturing. (APPLY)
		CO6	Discuss about calibration and validation of various equipments which are used in pharmaceutical. (UNDERSTAND)
7	Medicinal Chemistry-III (Practical) (BP607P)	CO1	Discuss about the procedures and techniques in preparation of drugs/ intermediates (REMEMBER)
		CO2	Synthesize, purify and characterization of medicinal compounds (CREATE & ANALYSE)

		CO3	Analyze and the amount of drug in dosage form and determine the percentage purity. (ANALYSE)
		CO4	Preparation of medicinally important compounds or intermediates by Microwave irradiation technique (CREATE)
		CO5	Design structures and reaction using chem draw (CREATE)
		CO6	Determination of physicochemical properties by using drug design software (EVALUATE)
8	Pharmacology–III (Practical) (BP608P)	CO1	Recollect the dose calculations in various pharmacological experiments, and to demonstrate the anti-allergic activity or anti-ulcer activity in rat models. (REMEMBER)
		CO2	Illustrate and understand the effect of drugs on gastrointestinal motility and the effect of agonist/antagonists on guinea pig ileum. (UNDERSTAND)
		CO3	Deign serum biochemical parameters using semi auto analyzer. (CREATE)
		CO4	Analyse the effect of saline purgative on frog intestine, elucidate insulin hypoglycaemic effect and to test for pyrogens using rabbit method. (ANALYSE)
		CO5	Determine the acute oral toxicity (LD50), acute skin irritation / corrosion and acute eye irritation / corrosion of a test substance. (APPLY)
		CO6	Understand the pharmacokinetic parameters and comprehend biostatistics methods and designs in experimental pharmacology. (UNDERSTAND)
9	Herbal drug technology (Practical) (BP609P)	CO1	Perform preliminary phytochemical screening of crude drugs. (EVALUATE)
		CO2	Determination of the alcohol content of Asava and Arista. (APPLY)
		CO3	Evaluation of excipients of natural origin (EVALUATE)
		CO4	Incorporation of prepared and standardized extract in cosmetic formulations like creams, lotions and shampoos and their evaluation (CREATE)
		CO5	Incorporation of prepared and standardized extract in formulations like syrups, mixtures and tablets and their evaluation as per Pharmacopoeial requirements. (CREATE)
		CO6	Monograph analysis of herbal drugs from recent Pharmacopoeias (ANALYSE)
		CO7	Determination of Aldehyde content, Phenol content and Determination of total alkaloids. (APPLY)

3.7 Course Outcomes of B. Pharmacy Fourth Year – First Semester

S.NO	Course Name with code	Course number	Course outcome
IV YEAR B. PHARMACY –I SEMESTER (PCI)			
1	Instrumental Method of Analysis (Theory) (BP701T)	CO1	Differentiate and illustrate the instrumental methods of analysis such as spectroscopic, chromatography and electrophoretic techniques with volumetric methods of analysis. (UNDERSTAND, ANALYSE)
		CO2	Demonstrate the interaction of EMR with matter and its phenomenon in various spectroscopic techniques and to assess the spectral data. (UNDERSTAND, EVALUATE)
		CO3	Enumerate on affinity of matter with stationary and mobile phase, physico-

			chemical properties of matter to choose suitable chromatographic and electrophoretic technique. (REMEMBER, ANALYSE)
		CO4	Identify and categorize organic and inorganic compounds with different functional groups and to understand their structure at atomic, ionic, group and molecular level to recommend an appropriate spectroscopic technique for analysis. (UNDERSTAND, EVALUATE, APPLY)
		CO5	Demonstrate the theory, principle, construction and working of instrument components and the methodology employed for the analysis of drugs in various samples. (UNDERSTAND)
		CO6	Summarize and recall on estimation, characterization and interpretation of elements, ions, molecules by suitable instrumental technique. (UNDERSTAND, REMEMBER)
2	Industrial Pharmacy-II (Theory) (BP702T)	CO1	Design general requirements, personal requirements, space requirements of pilot plant scale up techniques for solids, liquid orals and semi solids. (CREATE)
		CO2	Develop step wise procedures for technology transfer from raw material up to documentation, approved regulatory bodies and technology transfer agencies in India. (CREATE)
		CO3	Demonstrate historical overview of regulatory affairs and roles and responsibilities of regulatory affairs professionals (UNDERSTAND)
		CO4	Illustrate the regulatory requirements for approval of a new drug by submitting investigational new drug and new drug application forms (UNDERSTAND)
		CO5	Interpret the various quality parameters like total quality management, six sigma concept and quality by design for maintaining quality of the product (UNDERSTAND)
		CO6	Demonstrate the organization and responsibilities of State licensing authority and Central drug standard control organization (UNDERSTAND)
3	Pharmacy Practice-(Theory) (BP703T)	CO1	Explain the basic knowledge on organization of hospital and hospital pharmacy, Various methods of distribution and hospital formulary in hospitals applying it in the practice of pharmacy. Summarizing ADR's. (UNDERSTAND)
		CO2	Develop the organisation and structure of community pharmacy and to build ability to design and run own community Pharmacy. Dispensing of proprietary products and maintenance of records. (CREATE)
		CO3	Demonstrate the knowledge of therapeutic drug monitoring, patient medication history interview and to apply the knowledge on assessment of drug related problems. (UNDERSTAND)
		CO4	Categorize and evaluate the role of hospital pharmacist in pharmacy and therapeutic committee, drug information services, patient counselling, prescribed medication order, education and training programmes in hospitals (ANALYSE)
		CO5	Enumerate budget preparation and implementation. Illustrating Clinical pharmacy and OTC drugs (UNDERSTAND)
		CO6	Differentiate and interpret clinical laboratory tests of specific disease states to provide better patient centered service. (UNDERSTAND) Describe the principles of drug store management and inventory control methods during practice. (REMEMBER)
4	Novel drug delivery systems (Theory) (BP704T)	CO1	Explain basic knowledge and approaches to design-controlled release formulations by different mechanisms, Physicochemical and biological properties of drugs and classification of polymers. (UNDERSTAND)
		CO2	INTERPRET various approaches for development of microcapsules, Micro particles, Implants, Osmotic pump, Concept of mucosal drug delivery systems and its applications. (UNDERSTAND)
		CO3	Design basic components, permeation enhancers and formulation approaches for transdermal drug delivery system. (CREATE)

		CO4	ILLUSTRATE various types of Gastro retentive drug delivery systems and its applications, Introduction of Naso-pulmonary routes of drug delivery systems example dry powder and nebulizers. (UNDERSTAND)
		CO5	Formulate the concept of targeted drug delivery systems and its applications. (CREATE)
		CO6	Develop Ocular and Intrauterine drug delivery systems along with advantages, disadvantages and its applications. (CREATE)
5	Instrumental Method of Analysis (Practical) (BP705P)	CO1	Recall the principles of spectroscopic techniques and relate the importance of absorption maxima, specific absorbance, solvents in the estimation of organic compounds. (REMEMBER)
		CO2	Experiment and analyze the selected drugs by UV, Visible Spectroscopy and Flourimetry. (APPLY)
		CO3	Estimate the concentration of alkaline earth metals (sodium, potassium) by Flame Emission Spectroscopy. (ANALYZE)
		CO4	Determine certain organic compounds by nepheloturbidimetry. (APPLY)
		CO5	Characterize and quantify of organic compounds, amino acids, plant pigments by chromatographic techniques. (ANALYZE)
		CO6	Recommend a suitable quantitative method (direct comparision method, calibration curve method, A1% 1cm method, simultaneous equation method etc) for analyzing the sample. (EVALUATE)
6	Practice School (Practical) [BP706PS]	CO1	Enumerate the importance of realistic learning through practice in various domains such as community pharmacy, drug testing and manufacturing, preclinical testing, clinical practice, patent filing, regulatory filing accounting, green audit and article writing. (REMEMBER)
		CO2	Illustrate and Familiarize with the aspects of realistic practice in the domain of interest (UNDERSTAND)
		CO3	Determine the knowledge and skills related to practical learning in the domain of interest (APPLY)
		CO4	Analyse the problems encountered during realistic practice and make use of theoretical knowledge to resolve those problems. (ANALYSE)
		CO5	Develop and build up the ability to perform well in the domain of interest after becoming an employee/entrepreneur. (CREATE)

3.7 Course Outcomes of B. Pharmacy Fourth Year – Second Semester

S.NO	Course Name with code	Course number	Course outcome
IV YEAR B. PHARMACY II SEMESTER (PCI)			
1	Biostatisitcs and Research Methodology (Theory) (BP801T)	CO1	Calculate measures of central tendency-mean, median, mode, pharmaceutical problems involving range, standard deviation and correlation and solve statistical problems (APPLY)
		CO2	Make use of regression and probability while analysing data by statistical methods (APPLY)
		CO3	Discuss need for research, experimental designs, parametric and non-parametric tests (UNDERSTAND)
		CO4	Analyze data by constructing different graphs and software's (ANALYSE)
		CO5	Design various experiments and generate methodologies (CREATE)
		CO6	Assess the importance of regression modelling and to build-up the ability to use in statistical problems (EVALUATE)
2	Social and Preventive Pharmacy (Theory)	CO1	Understand the concept of health and education (UNDERSTAND)
		CO2	Create awareness about various preventive measures of stated communicable and non- communicable diseases (CREATE)
		CO3	Apply the knowledge of national health programmes mention in real

	(BP802T)		world to serve the society (APPLY)
		CO4	Explain various vaccines under national immunization programme and their schedules (UNDERSTAND)
		CO5	Demonstrate the impact of socio-cultural factors and urbanization on health (UNDERSTAND)
		CO6	Evaluate the health and pharmacy related problems in societal perspective (EVAUATE)
3	Cosmetic Science (Theory) (BP809ET)	CO1	Define Cosmetics and Cosmeceuticals as per Indian and EU regulations and describe role of cosmetic excipients and building blocks in the formulation of cosmetics (REMEMBER)
		CO2	Formulate cosmetics for skin care and hair care as well as dental and oral care (CREATE)
		CO3	Explain the structure and function of the skin, hair, teeth and gums and discuss the fundamentals of sun protection, formulation of Sunscreens, antiperspirants and deodorants (UNDERSTAND)
		CO4	Design herbal cosmetics for skin care, hair care and oral care (CREATE)
		CO5	Assess cosmetics for various physico-chemical properties (EVALUATE)
		CO6	Design cosmetics and cosmeceuticals that address the problems of dry skin, acne, dermatitis, prickly heat, wrinkles, blemishes, hair fall, Dandruff, body odour, bleeding gums, mouth odour, teeth discoloration and sensitive teeth.(CREATE)
4	Advanced Instrumentation Techniques (Theory) (BP811ET)	CO1	Explain Principles of H-NMR and C-NMR, chemical shift, factors affecting chemical shift, coupling constant, Spin - spin coupling, relaxation, instrumentation and applications (UNDERSTAND)
		CO2	Describe the Principles, Fragmentation, Ionization techniques – Electron impact, chemical ionization, MALDI, FAB, Analyzers-Time of flight and Quadrupole, instrumentation, applications (REMEMBER)
		CO3	Enumerate Principles, instrumentation and applications of Thermogravimetric Analysis (TGA), Differential Thermal Analysis (DTA), Differential Scanning Calorimetry (DSC)(REMEMBER)
		CO4	Discuss the Origin of X-rays, basic aspects of crystals, X-ray Crystallography, rotating crystal technique, single crystal diffraction, powder diffraction, structural elucidation and applications (UNDERSTAND)
		CO5	Develop Electronic balance, UV-Visible spectrophotometer, IR spectrophotometer Fluorimeter, Flame Photometer, HPLC and GC (REMEMBER)
		CO6	Illustrate Radio immune assay: Importance, various components, Principle, different methods, Limitation and Applications of Radio immune-assay. Extraction techniques: General principle and procedure involved in the solid phase extraction and liquid-liquid extraction (UNDERSTAND)
		CO7	Summarize Hyphenated techniques-LC-MS/MS, GC-MS/MS, HPTLC-MS (UNDERSTAND)

3.9.1. Course Outcomes of Pharm. D First Year

PHARM D – I YEAR (PCI)			
S.NO	Course name with code	Course number	Course outcome
1	Human Anatomy and Physiology (Theory)	CO1	Study the anatomy and physiology, basic anatomical terms, functions of various organs of human body and cellular level organization. The various homeostatic mechanisms and their

	(T1101)		imbalances of various systems and note on the functions of tissues (REMEMBER)
		CO2	Recognize bones and joints of human body, and Overview of the functions of formed elements in the blood (Haemopoietic system) (UNDERSTAND)
		CO3	Differentiate lymph and its role in immunity. Explain anatomy and physiology of CVS. (ANALYZE, REMEMBER)
		CO4	Recall Respiratory, GIT and Urinary systems and its physiological studies (REMEMBER)
		CO5	Assess the structure and functions of sympathetic, parasympathetic system, brain, spinal cord and cranial nerves and to and to intrept the physiology of endocrine system. (EVALUATE)
		CO6	Explain the physiology of reproductive system, sense organs and to discuss the physiological skeletal muscles and sports physiology. (UNDERSTAND)
2	Human Anatomy and Physiology – Practical (T1108)	CO1	Identify and relate characteristics of various tissues of human body. (REMEMBER)
		CO2	Predict the number of RBC and WBC using hemocytometer. (EVALUATE)
		CO3	Demonstrate bleeding time, clotting time, blood pressure and blood group. (UNDERSTAND)
		CO4	Recall the functions of various organ system in human body. (REMEMBER)
		CO5	Interpret the mechanisms of pregnancy diagnosis tests and various family planning appliances. (UNDERSTAND)
		CO6	Construct and record simple curves using frog gastrocnemius sciatic nerve. (CREATE)
3	Pharmaceutics – Theory (T1102)	CO1	Explain handling of prescription, posology & dose calculation of drug in children. Different types of dosage form (UNDERSTAND)
		CO2	Discuss history of the profession of Pharmacy in India & Pharmacopeia and its development (UNDERSTAND)
		CO3	Explain the different pharmaceutical calculation involved in formulation (UNDERSTAND)
		CO4	Elaborate basic requirement and formulation of powder and liquid (monophasic & biphasic) dosages form (REMEMBER)
		CO5	Explain different types of extraction process mainly maceration, percolation and their applications, different types of surgical aids and their application (UNDERSTAND)
		CO6	Enumerate type of pharmaceutical incompatibility and analyzing the incompatibilities (REMEMBER)
4	Pharmaceutics – Practical (T1109)	CO1	Prepare and label monophasic dosge forms for internal use (Remember)
		CO2	Experiment with biphasic liquid dosage forms (Apply)
		CO3	Formulate and dispense solid dosage forms (CREATE)
		CO4	Formulate external liquid dosage forms (CREATE)
		CO5	Formulate semi-solid dosage forms (CREATE)
		CO6	Appraise the preparations of physical incompatibilities (EVALUATE)
5	Medicinal Biochemistry Theory (T1103)	CO1	Recall the structure and functions of cell and its constituents, various mechanisms for transport across membrane, catalytic activity of enzymes, enzyme action and applications of enzymes. (REMEMBER)
		CO2	Discuss the metabolism of carbohydrates, lipids, electron transport chain and ATP formation and identify the metabolic

			disorders. (REMEMBER, UNDERSTAND)
		CO3	Enumerate and summarize the metabolism and disorders associated with amino acids and nucleic acids. (REMEMBER, UNDERSTAND)
		CO4	Interpret the genetic code, describe the process of DNA replication and protein synthesis. (UNDERSTAND)
		CO5	Apply the knowledge of clinical chemistry in diagnosis and prognosis of diseases. (APPLY)
		CO6	Elaborate the principles of immunochemical techniques and their applications. (CREATE)
6	Medicinal Biochemistry – Practical (T110A)	CO1	Remember the qualitative analysis of urine for normal and abnormal constituents. (REMEMBER)
		CO2	Demonstrate the estimation and clinical significance of biological constituents such as Glucose, Creatinine, Calcium and Chlorides in urine. (UNDERSTAND)
		CO3	Describe and determine the blood constituents like glucose, Creatinine, uric acid, urea, proteins and infer the biological condition. (REMEMBER, UNDERSTAND, ANALYSE)
		CO4	Perform the lipid profile tests and liver function tests (SGOT, SGPT). (UNDERSTAND, APPLY)
		CO5	Determine the starch hydrolysis by salivary amylase and study the effect of temperature and pH on enzyme (salivary amylase) activity. (APPLY, ANALYSE)
		CO6	Discuss the preparation of standard buffer solutions and their pH measurements. (UNDERSTAND)
7	Pharmaceutical Organic Chemistry-Theory (T1104)	CO1	Understand Structures and Physical properties, isomerism and nomenclature of organic compounds. (REMEMBER)
		CO2	Explain Free radicals chain reactions of alkane and Alicyclic compounds, preaprations, reactions and mechanisms (REMEMBER)
		CO3	Understand the Nuclophilic aliphatic substitution reactions and Dehydrohalogination reactions of 1,2 halo alkanes (UNDERSTAND)
		CO4	Describe Electrophillic and free radicals' addition and Carbon-carbon double bond as substituents and free radical substitution (REMEMBER)
		CO5	Understand Theory of resonance, and Elecrophilic aromatic substitution (UNDERSTAND)
		CO6	Explain Nucleophilic addition reactions and mechanism and application of named reactions like, aldol condensation, claisen condensation, cannizzaro, Migration to electron deficient nitrogen like Hoffman's reactions (UNDERSTAND)
8	Pharmaceutical Organic Chemistry – Practical (T110B)	CO1	Demonstrate Nucleophilic aromatic substitution, Oxidation and reduction reactions (UNDERSTAND) Analyze structures, preparations, assay, test for purity and uses of official compounds. (ANALYSE)
		CO2	preparation of organic compounds by various techniques (CREATE)
		CO3	Explain and understand the principal, reaction mechanism and illustrate application (UNDERSTAND)
		CO4	Synthesize and purification of organic compounds (CREATE)
		CO5	Perform the preliminary and elemental analysis of organic compound and identify functional group of organic compounds by systematic qualitative analysis (CREATE & ANALYSE)
		CO6	Explain and understand the principal behind various qualitative tests and analyse the given unknown organic compound having

			different functional groups (CREATE & ANALYSE)
9	Pharmaceutical Inorganic Chemistry – Theory (T1105)	CO1	Explain stereo models of some organic compounds (UNDERSTAND)
		CO2	Enumerate errors in pharmaceutical analysis and principles of volumetric analysis (REMEMBER)
		CO3	Interpret acid base titrations and limit tests for inorganic compounds. (UNDERSTAND)
		CO4	Choose the appropriate titrimetric method for analysis of drugs. (APPLY)
		CO5	Characterize and study method of preparation and assay of selected inorganic compounds. (Analyse)
		CO6	Demonstrate the importance of inorganic pharmaceuticals in preventing and curing the disease. (UNDERSTAND)
10	Pharmaceutical Inorganic Chemistry – Practical (T110C)	CO1	Illustrate the Radioisotopes and applications of Radiopharmaceuticals. (UNDERSTAND)
		CO2	Recall the glassware and apparatus used in volumetric analysis (REMEMBER)
		CO3	Demonstrate the limit test for impurities in inorganic compounds (UNDERSTAND)
		CO4	Apply the volumetric methods for performing assays (APPLY)
		CO5	Evaluate selected inorganic compounds by different titrimetric methods (EVALUATE)
		CO6	Determine the compunds present in a mixture (APPLY)
11	Remedial Mathematics (T1106)	CO1	Justify test for identity of selected inorganic compounds (EVALUATE)
		CO2	Identify the importance of mathematics in pharmacy. (REMEMBER)
		CO3	Review the various topics in mathematics. (UNDERSTAND)
		CO4	Formulate mathematical equations in doing problems. (CREATE)
		CO5	Assemble the different concepts in solving problems. (CREATE)
		CO6	Justify the important applications of mathematics. (EVALUATE)
12	Remedial Biology Theory (T1107)	CO1	Design and convert elementary functions using Laplace transform. (CREATE)
		CO2	List the organization of plants, animals and its inclusions. (REMEMBER)
		CO3	Differentiate the functions of various types of tissues and kingdom classification in plants and animals. (UNDERSTAND)
		CO4	Develop knowledge on structural modifications in plants and importance of plant physiology. (CREATE)
		CO5	Infer various physiological processes in plants and animals. (ANALYSE)
		CO6	Enumerate the various taxonomical characters of different families and micro-organisms. (REMEMBER)
		CO7	Differentiate the detailed study of frog, its internal structure & functions. (UNDERSTAND)
13	Remedial Biology - Practical (T110D**)**	CO1	Demonstrate the study of different kinds of phylum's includes Pisces, Reptiles, Amphibians, Aves& Mammals. (UNDERSTAND)
		CO2	Explain about basic concept of microscopes and permanent slides (UNDERSTAND)
		CO3	Appraise the cell wall constituents and cell inclusions of plant parts. (EVALUATE)

S.NO	Course name with code	Course number	Course outcome
II PHARM.D (PCI)			
1	Pathophysiology Theory (T2101)	CO1	Describe basic aspects of cell injury and adaptation, and role of chemical mediators in inflammation and healing mechanism, along with biological effects of radiation on cell. (REMEMBER)
		CO2	Explain immune response and autoimmune diseases along with organ compatibility in transplantation (UNDERSTAND)
		CO3	State the principles involved in pathophysiology of cancer while understanding the classification of tumours (REMEMBER)
		CO4	Compare the types of shock that influences their mechanism and management.
		CO5	Describe pathophysiology and etiology involved in environmental, nutritional and infectious diseases. (REMEMBER)
		CO6	Identify the cause and pathophysiology of common diseases associated with nervous, cardiovascular, gastrointestinal, liver, renal and respiratory system. (REMEMBER)

2	Pharmaceutical Microbiology Theory (T2102)	CO1	Describe about science of microbiology, Major divisions of microbial world and Relationship among them (UNDERSTAND)
		CO2	Discuss about Different methods of classification of microbes like Bacteria, Fungi, virus, Rickettsiae, Spirochetes,Nutritional requirements, growth and cultivation of bacteria and virus, different important media required for the growth of aerobic and anaerobic bacteria & fungi. (UNDERSTAND)
		CO3	Demonstrate about Differential media, enriched media and selective media, maintenance of lab cultures, Different methods used in isolation and identification of bacteria with different staining techniques and biochemical reactions, Counting of bacteria -Total and Viable counting techniques(UNDERSTAND)
		CO4	Describe about sterilization and Sterilization methods for all pharmaceutical products , sterility testing of different pharmaceutical preparations and Validation , Disinfectants, antiseptics, fungicidal and virucidal agents factors affecting their activation and mechanism of action, Evaluation of bactericidal, bacteristatic, , virucidal activities, evaluation of preservatives in pharmaceutical preparations(REMEMBER)
		CO5	Explain about Immunity, Definition, Classification, General principles of natural immunity, Phagocytosis, acquired immunity(active and passive),Antigens, Antibodies, Antigen-Antibody reactions, Bacterial exotoxins and endotoxins,Significance of toxoids in active immunity, Immunization programme, and importance of booster dose and Diagnostic tests (REMEMBER)
		CO6	Discuss the concept of Microbial culture sensitivity Testing,Principles,methods of different microbiological assays, microbiological assay of Penicillin, Streptomycin and vitamin B2 and B12, Standardization of vaccines and sera,infectious diseases like Typhoid, Tuberculosis, Malaria, Cholera, Hepatitis, Meningitis, Syphilis & Gonorrhea and HIV (UNDERSTAND)
3	Pharmaceutical Microbiology Practical (T2107)	CO1	Introduction and disscuss about different eqipment used in microbiology (UNDERSTAND)
		CO2	Analysis of characteristics of microbial by staining techniques,isolation methods,quantitave estimation (ANALYSE)
		CO3	Discuss about consrtruct standard graphs for estimating antibiotic, vitamin by using microbes (UNDERSTAND)
		CO4	Evaluation of microbial contamination in a given sample (EVALUATE)
		CO5	Analyse the qualitatively and quantitavely the amout of microbes in a sample (ANALYSE)
		CO6	Evaluation of the microbes by serological and bacteriological methods (EVALUATE)
4	Pharmacognosy and Phytopharmaceuticals Theory (T2103)	CO1	Discuss the concept of Microbial culture sensitivity Testing, Principles, methods of different microbiological assays, microbiological assay of Penicillin, Streptomycin and vitamin B2 and B12, Standardization of vaccines and sera, infectious diseases like Typhoid, Tuberculosis, Malaria, Cholera, Hepatitis, Meningitis, Syphilis & Gonorrhoea and HIV (UNDERSTAND)
		CO2	Explain the Cultivation, collection, processing and storage of crude drugs. Detailed method of cultivation of crude drugs. (UNDERSTAND)
		CO3	Illustrate study of cell wall constituents and cell inclusions. Detailed study of various cell constituents. Different methods of adulteration of crude drugs. (UNDERSTAND)
		CO4	Define Carbohydrates and related products. Detailed study carbohydrate containing drugs. (REMEMBER)

		CO5	Define sources, methods of extraction, chemistry and method of analysis of lipids. Detailed study of oils. (REMEMBER)
		CO6	Define classification, chemistry and method of analysis of protein. Study of plants fibers used in surgical dressings and related products. (REMEMBER)
5	Pharmacognosy and Phytopharmaceuticals (Practical) (T2108)	CO1	Explain the Introduction of Pharmacognosy laboratory and experiments. (UNDERSTAND)
		CO2	Explain Study of cell wall constituents and cell inclusions. (UNDERSTAND)
		CO3	Determine the Macro, powder and microscopic study of Datura, Senna, Cinnamon, Cinchona ,ephedra, quassia, clove (APPLY)
		CO4	Determine Macro, powder and microscopic study of Fennel, Coriander, Isapgol, Nux vomica, rauwolfia, Liqourice, Podopyllum, ginger (APPLY)
		CO5	Determination of Iodine value, Saponification value and unsaponifiable matter (APPLY)
		CO6	Determination of ester value, acid value (APPLY)
		CO7	Define the fundamental concepts of pharmacology and pharmacokinetics and to understand the basics of pharmacodynamics, route of administration, drug toxicity, drug interactions, adverse reactions and Pre-clinical evaluation drug discovery. (REMEMBER)
6	Pharmacology 1 Theory (T2104)	CO1	Identify the role of neuro-humoral transmission and drugs acting on Autonomic nervous system and summarize the drugs acting on it. (REMEMBER)
		CO2	Analyse the pharmacology of drugs acting on cardiovascular system. (ANALYSE)
		CO3	Summarise the functions of neurotransmitters and drugs acting on central nervous system. (UNDERSTAND)
		CO4	Assess the drugs used in respiratory complications. (EVALUATE)
		CO5	Demonstrate the drugs acting on endocrine system. (UNDERSTAND)
		CO6	Predict the role of autacoids and related drugs. (EVALUATE)
		CO7	Describe scope of community pharmacy and roles and responsibilities of community pharmacist in essential drug concept and rational drug therapy along with code of ethics. (REMEMBER)
7	Community Pharmacy Theory (T2105)	CO1	Compute designing, maintenance and legal requirements to set up a community pharmacy along with various methods involved in inventory control. (APPLY)
		CO2	Enumerate the various composition of prescription along with identification of medication errors. (REMEMBER)
		CO3	Describe the roles and responsibilities of community pharmacist in pharmaceutical care, patient counselling, medication adherence and OTC medications. (REMEMBER)
		CO4	Determine health screening services like Blood Pressure, blood sugar, lung function test and cholesterol testing. (APPLY)
		CO5	Describe on health education for communicable, nutritional deficiency diseases and family planning along with pathophysiology and treatment for minor ailment. (REMEMBER)
		CO6	Describe the pathophysiology of cardiovascular diseases and the ability to identify therapeutic approach for management of these diseases. (REMEMBER)
8		CO1	State the various respiratory diseases and the diagnostic skills required for the assessment of such diseases to provide a suitable therapeutic plan. (REMEMBER)

	Pharmacotherapeutics 1 Theory (T2106)	CO2	Develop knowledge on various endocrine diseases and attain skills of diagnosis and management of these diseases. (CREATE)
		CO3	Explain the significance of preparation of individualised therapeutic plan on paediatric patients and geriatric patients along with pregnant and lactating women. (UNDERSTAND)
		CO4	Summarise the therapeutic approach to diseases related to ophthalmology. (UNDERSTAND)
		CO5	Demonstrate the role of pharmacist in analysing specific parameters related to drug therapy and to provide rational drug formulations. (UNDERSTAND)
		CO6	Describe the pathophysiology of cardiovascular diseases and the ability to identify therapeutic approach for management of these diseases. (REMEMBER)
9	Pharmacotherapeutics 1 Practical (T2109)	CO1	State the various respiratory diseases and the diagnostic skills required for the assessment of such diseases to provide a suitable therapeutic plan. (REMEMBER)
		CO2	Develop knowledge on various endocrine diseases and attain skills of diagnosis and management of these diseases. (CREATE)
		CO3	Explain the significance of preparation of individualised therapeutic plan on paediatric patients and geriatric patients along with pregnant and lactating women. (UNDERSTAND)
		CO4	Summarise the therapeutic approach to diseases related to ophthalmology. (UNDERSTAND)
		CO5	Demonstrate the role of pharmacist in analysing specific parameters related to drug therapy and to provide rational drug formulations. (UNDERSTAND)
		CO6	Introduction and disscuss about different eqipment used in microbiology(UNDERSTAND)

III PHARM.D (PCI)			
S.NO	Course name with code	Course number	Course outcome
1	Pharmacology-II Theory (T3101)	CO1	Illustrate various agents acting on blood and treatment of blood disorders. (UNDERSTAND)
		CO2	Analyse the drugs acting on renal system and describe the various ways of drugs action.(ANALYSE)
		CO3	Understand and expand the knowledge on principles of chemotherapy and illustrate the mechanism of action of different antibiotics.(UNDERSTAND)
		CO4	Assess the role of immunotherapeutic agents.(EVALUATE)
		CO5	Describe various principles of animal toxicology. (REMEMBER))
		CO6	Determine the role of genetic material in the synthesis of proteins. To understand gene structure and function with recombinant DNA technology.(APPLY)
2	Pharmacology-II Practical (T3107)	CO1	Recollect the different laboratory animals, equipment, and learn the importance of physiological salt solutions, routes of drug administration, and effect of anaesthetics that were utilized in experimental pharmacology.(REMEMBER)
		CO2	Appraise the dose response relationship, effect of drugs on DRC and to construct the drug concentrations.(EVALUATE)
		CO3	Construct bioassays using different methods.(CREATE)
		CO4	Assess the potency of test substance and analyse the results from numerous animal investigations.(EVALUATE)
		CO5	Interpret various screening models for analgesic, anticonvulsant, anti-depressant and anti- inflammatory activity of drugs.

			(UNDERSTAND)
		CO6	Analyze isolated frog heart preparations to assess the cardio tonic action of drugs.(ANALYSE)
3	Pharmaceutical Analysis Theory (T3102)	CO1	Explain concepts of validation,calibration,ICH,GLP,TQM,1SO9000 and quality variation aspects.(UNDERSTAND)
		CO2	Discuss about the definition, Introduction, Principle, instrumentation and Methodology of Various Types of Chromatography like Column, Paper, TLC, Electrophoresis, Affinity chromatography, High performance liquid chromatography, Gas chromatography. (UNDERSTAND)
		CO3	Illustrate the theoretical aspects, Instrumentation &interpretation of data by using electrometric methods like potentiometry, conductometry, polarography, amperometry titrations.(UNDERSTAND)
		CO4	Demonstrate and Explain the Principle, Theory, Instrumentation and Working of UV - Visible Spectroscopy and Fluorimetry along with its applications.(UNDERSTAND)
		CO5	Describe the Introduction, Principle, Types of vibrations and factors affecting them, Instrumentation and Working of Infra-red Spectroscopy, Flame Photometry along with its applications. (REMEMBER)
		CO6	Enumerate Introduction, Principle, along with its applications of Mass spectroscopy, NMR Spectroscopy, ESR Spectroscopy, polarimetry, X-Ray diffraction. And thermal methods like DTA,DSC.(REMEMBER)
4	Pharmaceutical Analysis Practical (T3108)	CO1	Identify and separate of mixture of compounds by paper chromatography, thin layer chromatography. (REMEMBER)
		CO2	Determine the effect of pH, solvent, dissociation constant and comparison of given compound with its derivatives by UV-visible Spectroscopy, interpret compound from NMR and IR spectroscopy (APPLY)
		CO3	Demonstrate the instrumentation of HPLC, HPTLC, HPLC,GC-MS, ,DSC.(UNDERSTAND)
		CO4	Determine the compoundsby using flame photometry,Nephaloturbidimetry,fluorometric, techniques(APPLY)
		CO5	Evaluate the two drugs present in given formulation simultaneously by using UV spectrophotometer and to determine drugs using colorimetry. (EVALUATE)
		CO6	Analyse the mixture of acids with base by conductometric and potentiometric titrations. (ANALYSE)
5	Pharmacotherapeutics- II Theory (T3103)	CO1	List the guidelines involved in rational use of antibiotics and surgical use of prophylaxis. (REMEMBER)
		CO2	Sketch the therapeutic approach based on the causative organism and the resulting pathogenesis of infectious diseases like tuberculosis, meningitis, malaria, fungal and viral infections etc. (ANALYSE)
		CO3	Analyse the pathophysiology involved in various musculoskeletal diseases to provide suitable therapeutic management like Osteoarthritis, Rheumatoid arthritis, Gout etc. (ANALYSE)
		CO4	Sketch therapeutic management on the basis of stages of renal failure along with the mechanisms involved in drug induce renal diseases. . (ANALYSE)
		CO5	Enumerate the principles and general aspects of chemotherapeutic agents, specifically for breast and blood cancer along with management of nausea and vomiting induced by chemotherapy. (REMEMBER)

		CO6	State the pathogenesis of organisms that cause dermal infections and provide suitable drug therapy. (REMEMBER)
6	Pharmacotherapeutics- II Practical (T3109)	CO1	Decide the principles guiding the prudent use of antibiotics and surgical prophylaxis.(EVALUATE)
		CO2	Interpret therapy strategy based on the etiological agent and the pathogenesis of infectious diseases, such as tuberculosis, meningitis, malaria, fungal and viral infections, etc. (UNDERSTAND)
		CO3	Choose appropriate treatment therapy for a variety of musculoskeletal illnesses, such as osteoarthritis, rheumatoid arthritis, gout, etc., one must understand the pathophysiology involved. (APPLY)
		CO4	Analyse therapeutic management based on the mechanisms underlying drug-induced renal illnesses as well as the phases of renal failure. (ANALYSE)
		CO5	Decide the management of nausea and vomiting brought on by chemotherapy, as well as the principles and general characteristics of chemotherapeutic drugs, specifically for breast and blood cancer. (EVALUATE)
		CO6	Interpret the pathophysiology of the microbes that cause skin infections and to offer effective medication therapy. (UNDERSTAND)
7	PharmaceuticalJurisprudence Theory (T3104)	CO1	Recall the concepts of pharmaceutical legislations in India and code of pharmaceutical ethics(REMEMBER)
		CO2	Demonstrate the schedules and provisions given under Drugs and Cosmetics act 1940 and its rules 1945(UNDERSTAND)
		CO3	Determine the provisions of Pharmacy act 1948 and procedure for registration of pharmacist and to describe constitution and functions of PCI and State Pharmacy councils(APPLY)
		CO4	List out the provisions under medicinal and toilet preparations act, narcotic drugs and psychotropic substances act and rules, drugs and magic remedies act and rules(REMEMBER)
		CO5	Discuss the importance of Essential commodities act , and National drug policy and to outline the procedure to get a patent under the Patents and design act 1970 (UNDERSTAND)
		CO6	Explain the salient features of Prevention of cruelty to animals act and to summarize the list of prescription and nonprescription drugs, DPCO act (UNDERSTAND)
8	Medicinal chemistry Theory (T3105)	CO1	Describe brief introduction of modern concept of drug design: QSAR, CADD, Combinatorialchemistry, Prodrug, anti sense drugs.(REMEMBER)
		CO2	Explain in detail about drugs, and their structure, M.o.A, Classification, synthesis, SAR of local anti infectives and Sulphonamides (UNDERSTAND)
		CO3	Discuss history, development, degradation reactions, structure, SAR, M.o.a., synthesize and uses of antibiotics, antimalarials, antineoplastics. (CREATE & UNDERSTAND)
		CO4	Explain in detail about structure, M.O.A, adverse effects and uses of cardiovascular drugs, oral hypoglycaemics. (UNDERSTAND)
		CO5	Define thyroid, antithyroid drugs, diagnostic agents and write in detail their M.O.A, synthesis and uses. (REMEMBER)
		CO6	Explain in detail about diuretics, steroidal hormones and adrenocortical drugs.(UNDERSTAND)
9	Medicinal chemistry Practical	CO1	Recall the various techniques of medicinal compounds (REMEMBER)
		CO2	Synthesize and understand the principle, mechanism of various

	(T3110)		preparations(CREATE)
		CO3	Prepare and explain purification of medicinal compounds (UNDERSTAND)
		CO4	Perform assay and calculate percentage purity of medicinal compounds (ANALYSE)
		CO5	Determine percentage purity of medicinal compounds by Various techniques (APPLY)
		CO6	Identification of medicinal compounds (REMEMBER)
10	Pharmaceutical Formulations (T3106) (Theory)	CO1	Remember the types of tablets &describe the granulation techniques (REMEMBER)
		CO2	Determine the quality control test and apply evaluation of uncoated as well as coated tablets. (APPLY)
		CO3	Explain production and filling of hard & soft gelatine capsules. Quality control tests for capsules. (UNDERSTAND)
		CO4	Formulate and evaluate the semisolid preparation such as ointments ,gels (CREATE)
		CO5	Describe the formulation concepts of pharmaceutical suspensions and remember the emulsions and their stability problems (REMEMBER)
		CO6	Understand the production facilities of Parenterals and Summarize various controlled and novel drug delivery systems (UNDERSTAND)
11	Pharmaceutical Formulations (T3111) (Practical)	CO1	Formulate and develop different types of tablets (CREATE)
		CO2	Explain and formulate the manufacture of hard gelatin capsule (UNDERSTAND)
		CO3	Understand and review preparation of parenterals (UNDERSTAND)
		CO4	Appraise and evaluatedifferent liquid orals formulations (EVALUATE)
		CO5	Asses and evaluate semisolid preparations (EVALUATE)
		CO6	Preparation of cosmetics (CREATE)

PHARM D – IV YEAR (PCI)

S.NO	Course name with code	Course number	Course outcome
1	Pharmacotherapeutics III Theory (T4101)	**CO1**	Recognize the pathophysiology of gastrointestinal and liver diseases and the ability to identify therapeutic approach for management of these diseases. (UNDERSTAND)
		CO2	Differentiate the various haematological diseases and the diagnostic skills required for the assessment of such diseases to provide a suitable therapeutic plan. (UNDERSTAND)
		CO3	Describe various diseases associated with nervous system and attain skills of diagnosis and management of these diseases. (REMEMBER)
		CO4	Summarise the therapeutic approach to psychiatry disorders like schizophrenia, affective disorders, anxiety disorders, sleep disorders and obsessive-compulsive disorders. (UNDERSTAND)
		CO5	Describe the various pain pathways in order to provide pain management in neuralgias and headaches. (REMEMBER)
		CO6	Determine judicious use of current best evidence available for a drug therapy. (APPLY)
2	Pharmacotherapeutics III Practical (T4107)	**CO1**	Recognize the pathophysiology of gastrointestinal and liver diseases and the ability to identify therapeutic approach for management of these diseases. (UNDERSTAND)
		CO2	Differentiate the various haematological diseases and the diagnostic skills required for the assessment of such diseases to provide a suitable therapeutic plan. (UNDERSTAND)

		CO3	Describe various diseases associated with nervous system and attain skills of diagnosis and management of these diseases. (REMEMBER)
		CO4	Summarise the therapeutic approach to psychiatry disorders like schizophrenia, affective disorders, anxiety disorders, sleep disorders and obsessive-compulsive disorders. (UNDERSTAND)
		CO5	Describe the various pain pathways in order to provide pain management in neuralgias and headaches. (REMEMBER)
		CO6	Determine judicious use of current best evidence available for a drug therapy. (APPLY)
3	Hospital Pharmacy Theory (T4102)	CO1	Define the structure, organisation and functions of hospital and hospital pharmacist (REMEMBER)
		CO2	Preparation and implementation of budget, inventory control and various drug policies (CREATE)
		CO3	Interpret various hospital committees to develop hospital pharmacy and newsletters (UNDERSTAND)
		CO4	Explain the sterile services, various drug distribution methods or inpatients and outpatients including narcotic and controlled drugs (UNDERSTAND)
		CO5	Describe procurement, manufacturing and storage process various formulations and handling of radio pharmaceuticals (REMEMBER)
		CO6	Develop programmes for professional upraising continuously and to build inter professional (CREATE)
4	Hospital Pharmacy Practical (T4108)	CO1	Describe drug profiles and drug distribution systems and various committees in hospitals (REMEMBER)
		CO2	Evaluate the rationality of prescriptions (EVALUATE)
		CO3	Design various methods for the preparation and labelling of pharmaceutical products such as powders and intravenous solutions (CREATE)
		CO4	Write the solutions to overcome the drug interactions and adverse drug reactions (REMEMBER)
		CO5	Describe various store management and inventory control (REMEMBER)
		CO6	Explain drug information queries through the systematic approach (UNDERSTAND)
5	Clinical Pharmacy Theory (T4103)	CO1	Understand and explain scope and development of clinical Pharmacy the daily activities and roles of clinical pharmacist and to monitor the patient drug therapy through medication chart review and clinical review (UNDERSTAND)
		CO2	Describe medication history interview and counsel the patients on various diseases and life style modifications by applying communication skills (REMEMBER)
		CO3	Assess the response to DUE, drug information queries using systematic approach and to establish a drug information and poison information centre (EVALUATE)
		CO4	Interpret selected laboratory results of specific diseases status mentioned and report ADRs, drug related problems and medication errors understand the pharmacovigilance (UNDERSTAND)
		CO5	Understand the concept pharmacovigilance (UNDERSTAND)
		CO6	Evaluate biomedical literature in order to get unbiased clinical evidence to develop individualised pharmaceutical care plan (EVALUATE)
6	Clinical Pharmacy	CO1	Describe drug profiles, Ward rounds and counselling techniques various laboratory tests. (REMEMBER)

	Practical (T4109)	CO2	Explain and respond to drug information queries using modified systematic approach by critically appraising the biomedical literature (UNDERSTAND)
		CO3	Create awareness in patients by counselling them on various diseases using clinical knowledge and communication skills (CREATE)
		CO4	Create awareness in patients by counselling them on various drugs using cinical knowledge and communication skills (CREATE)
		CO5	Interpret laboratory results of specific disease while monitoring disease progression (UNDERSTAND)
		CO6	Develop comprehensive and meticulous medication history interview for the preparation of individualized pharmaceutical care plan (CREATE)
7	Bio pharmaceutics & Pharmacokinetics Theory (T4105)	CO1	Demonstrate the importance of biostatistics in pharmacy (UNDERSTAND)
		CO2	Explain the importance of research methods in the design of pharmacoepidemiologic study. (UNDERSTAND)
		CO3	Determine appropriate statistical methods for data analysis and choose the methods of collection of data and its analysis and interpretation (APPLY)
		CO4	Discuss and evaluate various software for statistical analysis of data (UNDERSTAND)
		CO5	Explain various methods of testing hypothesis
		CO6	List the importance and procedures for using computers in pharmacy (REMEMBER)
8	Bio pharmaceutics & Pharmacokinetics Practical (T4110)	CO1	Recall the basic concepts of absorption, distribution, metabolism and excretion of drugs. (REMEMBER)
		CO2	Describe the mechanisms, interpret various factors affecting drug absorption, distribution, metabolism and excretion of drugs. (REMEMBER)
		CO3	Apply the pharmacokinetic models for the determination of pharmacokinetic parameters. (APPLY)
		CO4	Assess multiple dosage regimens based on pharmacokinetic parameters for maximizing therapeutic effectiveness and patient compliance (EVALUATE)
		CO5	Choose various pharmacokinetic parameters for the drugs exhibiting saturation kinetics. (ANALYSE)
		CO6	Design the bioavailability testing protocol of a drug and compare the bioequivalence between marketed products. (CREATE)
9	Biostatisitcs And Research Methodology (4T105)	CO1	Recall the concepts in biopharmaceutics, basic pharmacokinetic parameters and their significance. (REMEMBER)
		CO2	Interpret the effect of surfactant, diluents, lubricant and Polymorphism on rate of drug dissolution. (UNDERSTAND)
		CO3	Solve bioavailability parameters of drugs by using plasma data and methods to improve bioavailability. (APPLY)
		CO4	Analyze absorption rate constant, KE, biological half-life, mean residence time and mean absorption time for the given data (ANALYZE)
		CO5	Enumerate the extent of protein biding by equilibrium dialysis or dynamic dialysis methods. (REMEMBER)
		CO6	Predict the pharmacokinetic parameters for the given data as per one compartment and two compartment models. (EVALUATE)
10	Clinical toxicology Theory	CO1	State the general aspects of management of poisoning along with antidotes for specific application. (REMEMBER)
		CO2	Describe supportive cares like Airway Breathing Circulation in

	(T4106)		case of poisoning and also methods of gut decontamination for elimination of such poisons. (REMEMBER)
		CO3	Enumerate the toxicokinetics of the poison and application of extracorporeal methods for elimination of toxins. (REMEMBER)
		CO4	State management of acute poisoning based on symptoms due to caustics, neurotoxins, irritants, pesticides, hydrocarbons, NSAIDs and radiation. (REMEMBER)
		CO5	Explain therapeutic management for chronic poisoning of heavy metals based on the diagnostic investigations. (UNDERSTAND)
		CO6	Demonstrate management plans for food poisoning, snake bites and arthropod bites and stings. (UNDERSTAND)

PHARM.D – V YEAR (R08)			
S.NO	Course name with code	Course number	Course outcome
1	Clinical research (T5101)	CO1	Explaindevelopmental process of new chemical entity discovered via pharmacological approach, toxicological approach, Investigational New Drug Application, drug characterization and dosage form. (REMEMBER)
		CO2	Interpretthe different phases of trial and to evaluate the safety and efficacy of the drug from pre-clinical trials to post marketing surveillance. (UNDERSTAND)
		CO3	Describeregulatory authorities (ICH, CDSCO) responsibilities for monitoring clinical trial process, lay guidelines and address to its challenges in implementation. (REMEMBER)
		CO4	Identifyguidelines followed for the countries USA, India and Europe along with roles and responsibilities of clinical trial personnel. (UNDERSTAND)
		CO5	Tabulatethe ethical guidelines in clinical research along with composition and functions of institutional review board. (REMEMBER)
		CO6	Assembleessential clinical study documents needed in clinical trial, like case report forms, informed consent form, participant identification centers etc. are involved. (CREATE)
		CO7	Describerole of computers in data management along with safety monitoring in clinical trials. (REMEMBER)
2	Pharmacoepidemiology & Pharmacoeconomics (T5102)	CO1	Explain the origin, scope and applications of Pharmacoepidemiologyand Pharmacoeconomics in clinical settings and discuss the various Pharmacoepidemiologic outcome measures. (UNDERSTAND)
		CO2	Choosethe tools effectively in evaluating risk and benefit of therapy and determinethe concept of risk in pharmacoepidemiology and different methods of measurement of risk. (APPLY)
		CO3	Explain various pharmacoepidemiology studies and evaluate the outcomes of measures using case studies. Understand the Pharmacoepidemiologic databases and illustrate the sources of data for Pharmacoepidemiologic studies. (UNDERSTAND)
		CO4	Describe the selected special applications of pharmacoepidemiology. (REMEMBER)
		CO5	Explain pharmacoeconomic outcome measures and discuss the various methods to measure outcomes in pharmacoeconomic studies. (UNDERSTAND)
		CO6	Selectthe various types of software and its applications inPharmacoeconomic analysis using case studies. (ANALYSE)

3	Clinical Pharmacokinetics and Pharmacotherapeutic Drug Monitoring (T5103)	CO1	Understandthe basics of pharmacokinetics, nomograms, tabulations and their applications and design the dosage regimen and therapy of a drug based on the pharmacokinetic principles and route of administration. (UNDERSTAND)
		CO2	Describe the individualization the dosage regimen for the patients who are obese, pediatrics, geriatrics and patients with impaired renal and hepatic functions. (REMEMBER)
		CO3	Evaluate the patient case where they find potential drug-drug, drug-food, drug-disease interactions with appropriate recommendations for drug dosage and food adjustments. (EVALUATE)
		CO4	Develop knowledge about population pharmacokinetics data, Bayesian theory, adaptive method, and dosing with feedback. (CREATE)
		CO5	Analyse the plasma drug concentration with patient's therapeutic outcome in cardiovascular disease, seizure disorders, psychiatric disorders, organ transplantation, to formulate protocol of TDM and correlate TDM with drug therapy. (ANALYSE)
		CO6	Develop knowledge about pharmacogenetics and find the genetic polymorphisms in drug metabolism, drug transport & drug target in the patients, if any with the clinical outcomes in the patients. (CREATE)
4	Clerkship (T5104)	CO1	Analyse patient case sheet and classify the patient's illness, chief complaints, social history, family history, past and present medical history, occupational history, diagnosis, treatment and lifestyle modifications. (ANALYSE)
		CO2	Evaluate the diagnosis by observing all the laboratory investigations closely in chronological order and correlating it with the disease condition of the patient. (EVALUATE)
		CO3	Set-up patient counselling for the in-patients and OPD patients regarding medications, life style modifications and precautions. (CREATE)
		CO4	Identify any adverse drug reactions in any patient by closely monitoring and interviewing the patients. (REMEMBER)
		CO5	Identify any potential evidence of drug-drug, drug-food and drug-disease interactions and do interventions wherever required in consultations with the duty doctors. (REMEMBER)
		CO6	Choose evidence-based drug information to doctors, nurses, pharmacists and patients for their drug related queries and documenting it properly. (APPLY)
5	Project Work (T5105)	CO1	Describe the Aim and Objectives of the project by identifying the issues related to use of pharmaceuticals and health in community population or hospital epidemiology. (REMEMBER)
		CO2	Review literatures on the selected project topic to have understanding of current project work before starting new investigation on the work. (UNDERSTAND)
		CO3	Design the protocol comprising of aim, objectives, plan of the study, study duration, study site, materials and methods, statistical tools, data collection forms, etc.(CREATE)
		CO4	Evaluate the protocol by the ethical committee and head of the department and get it approved. (EVALUATE)
		CO5	Generate the data collection, analyse the data based upon the decided parameters, perform statistical analysis, draw the results and conclusion. (CREATE)
		CO6	Analyse the outcomes of the project work and its future scope in the given field of study. (ANALYSE)

PHARM.D – VI YEAR (R08)			
S.NO	**Course name**	**Course number**	**Course outcome**
1	INTERNSHIP	CO1	Analyse the case sheet of patients during ward round participation with the duty doctors by utilising their clinical, pharmacological, pathological, therapeutical knowledge and correlate the findings. (ANALYSE)
		CO2	Infer the diagnosis of the patients by analysing their laboratory, radiology and other reports. (ANALYSE)
		CO3	Design dose in paediatrics, geriatrics, and in patients with renal and hepatic impairment. (CREATE)
		CO4	Set-up patient counselling regarding their disease/disorder, medications, lifestyle modifications, adverse drug reactions, precautions and contraindications. (CREATE)
		CO5	Evaluate and analyse each case closely to find and report any drug-drug and drug-food interactions and do interventions if required. (EVALUATE, ANALYSE)
		CO6	Identify and provide evidence-based drug/poison information to doctors, nurses, pharmacists, patients for their drug/poison related queries. (REMEMBER)

M.PHARMACY (Pharmaceutical Technology) – I YEAR I SEMESTER (PCI)			
S.No	Course name with code	Course number	Course outcome
01	Modern Pharmaceutical Analytical Techniques Theory (MPH101T)	CO1	To recall and relate the instrumental methods of analysis such as electrochemical, spectroscopic, chromatographic and electrophoretic techniques with volumetric methods of analysis. (UNDERSTAND, ANALYSE)
		CO2	To demonstrate the interaction of EMR with matter and its phenomenon in various spectroscopic techniques; affinity of matter with stationary and mobile phase; temperature induced physical & chemical changes in matter; potential differences in sample solutions and to study various factors affecting the analysis. (REMEMBER, UNDERSTAND, EVALUATE)
		CO3	To identify and categorise organic and inorganic compounds with different functional groups and to understand their structure at atomic, ionic, group and molecular level to recommend an appropriate spectroscopic technique for analysis. (UNDERSTAND, EVALUATE, APPLY)
		CO4	To demonstrate the theory, principle, construction and working of instrument components and the methodology employed for the analysis of drugs in various samples. (UNDERSTAND)
		CO5	To gain knowledge on X-ray crystallographic techniques, immunological assays and thermal methods of analysis.
		CO6	To summarize the applications of various analytical techniques in relation to characterization of polymers, designing formulation and evaluation of formulation. (REMEMBER, APPLY, ANALYSE)
02	Drug Delivery System Theory (MPH102T	CO1	To describe about the basic concepts of Sustained release and Controlled release formulations. (REMEMBER)
		CO2	To discuss about the Dosage forms for personalized Medicine and categories of patients for personalized medicines. (REMEMBER)
		CO3	To explain about the Rate controlled drug delivery systems and feedback regulated drug delivery systems. (UNDERSTAND)
		CO4	To explain about the methods of formulation and its evaluations of Gastro-Retentive Drug Delivery Systems and Buccal Drug Delivery Systems.

	)		(UNDERSTAND)
		CO5	To describe the barriers of drug permeation in Occular Drug Delivery Systems, formulation and Evaluation of Transdermal Drug Delivery Systems. (REMEMBER)
		CO6	To explain about the Formulation and Evaluation of delivery systems of proteins and vaccines Delivery Systems. (UNDERSTAND)
03	Modern Pharmaceutics Theory (MPH103T)	CO1	To describe about the basic concepts of preformulation studies (REMEMBER)
		CO2	To discuss about the dispersion systems, parenterals and optimization process (UNDERSTAND)
		CO3	To explain about the validation of process, equipment and product (UNDERSTAND)
		CO4	To describe the cGMP concepts of layout of building, services and their maintenance &about the production management (UNDERSTAND)
		CO5	To describe the concepts of compression and compaction (REMEMBER)
		CO6	To explain about the parameters of consolidation and their applications (UNDERSTAND)
04	Regulatory Affair Theory (MPH104T)	CO1	To explain the Documentation in Pharmaceutical industry and Generic drugs product development (UNDERSTAND)
		CO2	To develop knowledge on Regulatory requirements for product approval (CREATE)
		CO3	Interpret the post approval regulatory affairs and ICH-Guidelines of ICH-Q, S, E, M (UNDERSTAND)
		CO4	To discuss the Regulatory requirements of EU, MHRA, TGA and ROW countries (UNDERSTAND)
		CO5	To develop knowledge on Non clinical drug development and Investigation of medicinal products dossier (CREATE)
		CO6	To explain the developing clinical trial protocols and institutional review board, pharmacovigilance safety monitoring in clinical trials (UNDERSTAND)
05	Pharmaceutics Practical I MPH105PA	CO1	To evaluate the drug(s) by various analytical techniques (EVALUATE)
		CO2	To demonstrate the working of Gas Chromatography (UNDERSTAND)
		CO3	To demonstrate of HPLC (UNDERSTAND)
		CO4	To determine pre-formulation studies of the given drug (APPLY)
		CO5	To analyze the effect of binder on disintegration of tablet (ANALYZE)
		CO6	To determine the flow properties of given drug (APPLY)
06	Pharmaceutical Practical II MPH105PB	CO1	To discuss the effect of various factors on drug dissolution (UNDERSTAND)
		CO2	To demonstrate the powder characteristics by constructing heckle plots (UNDERSTAND)
		CO3	To characterize the comparative dissolution studies between various dosage forms (ANALYZE)
		CO4	To evaluate the different dosage forms (EVALUATE)
		CO5	To design and evaluate different oral dosage forms (CREATE)
		CO6	To design and evaluate of different transdermal dosage forms (CREATE)
07	Seminar/Assignment	CO1	To recall the technical knowledge gained in the design and development of various formulations (REMEMBER)
		CO2	To compare and differentiate various pharmaceutical techniques involved in the nanotechnology and targeted drug delivery systems (ANALYZE)
		CO3	To develop communication skills and build various models basing on the knowledge acquired in the molecular pharmaceutics (CREATE)
		CO4	To test various hypothesis and develop problem solving skills in pilot

			development process (APPLY)
		CO5	To evaluate the pharmacokinetic parameters and synthesize modelling techniques based on the information available (EVALUATE)
		CO6	To create open minded environment in accepting the challenges and opportunities for designing the formulations (CREATE)

M.PHARMACY – I YEAR II SEMESTER (PCI)			
S.No	**Course name with code**	**Course number**	**Course outcome**
01	Molecular pharmaceutics (nano tech and targeted dds)- theory mph201t	CO1	To define the concepts involved in targeting drug delivery specific to tumor and brain. (REMEMBER)
		CO2	To review the formulation, optimization and evaluation of microcapsules, nanoparticles, liposomes and multiparticulate drug carrier systems. (UNDERSTAND)
		CO3	To develop nanoparticles, liposomes and multiparticulate and other drug delivery systems for drug delivery. (CREATE)
		CO4	To determine the formulation of pulmonary drug delivery systems and their evaluation. (APPLY)
		CO5	To discuss the concepts of gene therapy and liposomal gene delivery (UNDERSTAND)
		CO6	To differentiate the concepts of therapeutic antisense molecules, gene therapy and gene expression systems. (ANALYZE)
02	Advanced biopharmaceutics & pharmacokinetics- theory mph202t	CO1	To recall the basic concepts of absorption, distribution, metabolism and excretion of drugs. (REMEMBER)
		CO2	To understand the mechanisms, interpret various factors affecting drug absorption, distribution, metabolism and excretion of drugs (UNDERSTAND)
		CO3	To apply the knowledge of pharmacokinetic models for the determination of pharmacokinetic parameters (APPLY)
		CO4	To analyze the drug product performance by in-vitro, in-vivo and in-situ models (ANALYZE)
		CO5	To determine the bioavailability testing protocol of a drug and compare the bioequivalence among marketed products (APPLY)
		CO6	To predict pharmacokinetic and pharmacodynamic drug interactions of modified release drug products, targeted drug delivery systems (EVALUATE)
03	Computer aided drug delivery system - theory mph203t	CO1	To recall the basics of computers in pharmaceutical research and development, population modelling, and sensitivity analysis (REMEMBER)
		CO2	To illustrate the quality by design principles, computational modeling of drug disposition, application of drug transporters (UNDERSTAND)
		CO3	To determine the concepts for computer-aided formulation development, ethics of computing in pharmaceutical research (APPLY)
		CO4	To justify the pharmacokinetic and pharmacodynamic characteristics of drugs by simulations (EVALUATE)
		CO5	To assess the applications of computers in clinical datamanagement (EVALUATE)
		CO6	To discuss the impact of artificial intelligence, robotics and computational fluid dynamics (UNDERSTAND)
04		CO1	To remember the principles of pre-formulation studies, drug-excipient incompatibility (REMEMBER)
		CO2	To summarize the important concepts of formulation additives, design of experiments and process development (UNDERSTAND)

	Formulation Development of Pharmaceutical and Cosmetic Products -THEORY MPH204T	CO3	To apply the principles of solubility, micellar solubilization, and invitro in vivo correlation (APPLY)
		CO4	To develop the product stability protocols and ICH guidelines for long term testing of the products (CREATE)
		CO5	To justify the formulation and evaluation of cosmetic products (EVALUATE)
		CO6	To differentiate the regulatory guidelines for herbal cosmetics, herbal ingredients used in hair care, skin care and oral care (ANALYZE)
05	Pharmaceutics practical iii mph205pa	CO1	To recall the basic principles of analytical techniques and their instrumentation used for drug formulation and characterization (REMEMBER)
		CO2	To summarize the preformulation studies and basic excipients used for various controlled/sustained drug delivery systems (UNDERSTAND)
		CO3	To infer the use of various analytical instruments for estimation of drugs in various formulations (ANALYZE)
		CO4	To justify the formulation techniques, prepare matrix tablets, floating tablets and cosmetics (EVALUATE)
		CO5	To assess the drug release from sustained and controlled drug delivery systems (EVALUATE)
06	Pharmaceutics practical iv mph205pb	CO1	To recall the basic techniques for using design of experiment software (REMEMBER)
		CO2	To compare the data analysis techniques, and quality by design principles, sensitivity analysis, population modelling (ANALYZE)
		CO3	To develop various cosmetic products like creams, shampoos, toothpaste bases (CREATE)
		CO4	To test for drug binding characteristics, cell permeation and bioavailability of the formulations (APPLY)
		CO5	To evaluate the novel drug delivery systems (EVALUATE)
		CO6	To design formulations by QbD concept, use simulations for estimation of pharmacokinetics and pharmacodynamics (CREATE)
07	Seminar/ assignment	CO1	To recall the technical knowledge gained in the design and development of various formulations (REMEMBER)
		CO2	To compare and differentiate various pharmaceutical techniques involved in the nanotechnology and targeted drug delivery systems (ANALYZE)
		CO3	To develop communication skills and build various models basing on the knowledge acquired in the molecular pharmaceutics (CREATE)
		CO4	To test various hypothesis and develop problem solving skills in pilot development process (APPLY)
		CO5	To evaluate the pharmacokinetic parameters and synthesize modelling techniques based on the information available (EVALUATE)
		CO6	To create open minded environment in accepting the challenges and opportunities for designing the formulations (CREATE)

M.PHARMACY – III SEMESTER (PCI)			
S.No	Course name with code	Course number	Course outcome
01		CO1	To demonstrate the general research methodology including, study design and

	Research Methodology & Biostatistics (MRM301T)		strategies to eliminate errors/bias (UNDERSTAND)
		CO2	To explain the importance of biostatistics in pharmacy: statistical tests of significance, non-parametric tests, null hypothesis, P values and degree of freedom (UNDERSTAND)
		CO3	To discuss the Medical Research regarding values in medical ethics, conflicts between autonomy and beneficence and criticisms of orthodox medical ethics (UNDERSTAND)
		CO4	To describe the ethics committees, online business practise, conflicts of interest and vendor relationships (UNDERSTAND)
		CO5	To explain the CPCSEA guidelines for laboratory animal facility (UNDERSTAND)
		CO6	To explain about the Declaration of Helsinki regarding basic principles for all medical research and medical research combined with medical care (UNDERSTAND)
02	Journal club	CO1	To select the scientific concept based on literature and define the objectives of research (ANALYZE)
		CO2	To summarize the hypothesis and summarize the concept for presentation (UNDERSTAND)
		CO3	To discuss in a meeting, discuss SWOT analysis, the design and methods used in concept (UNDERSTAND)
		CO4	To analyze the variables and their inter relationships (ANALYZE)
		CO5	To conclude the results and to discuss its significance (EVALUATE)
		CO6	To appraise the concept for societal needs, acknowledge and improve presentation skills (EVALUATE)
03	Discussion / Presentation (Proposal Presentation)	CO1	To recall the technical knowledge gained in the design and development of various formulations (REMEMBER)
		CO2	To compare and differentiate various pharmaceutical techniques involved in the nanotechnology and targeted drug delivery systems (ANALYZE)
		CO3	To develop communication skills and build various models basing on the knowledge acquired in the molecular pharmaceutics (CREATE)
		CO4	To test various hypothesis and develop problem solving skills in pilot development process (APPLY)
		CO5	To evaluate the pharmacokinetic parameters and synthesize modelling techniques based on the information available (EVALUATE)
		CO6	To create open minded environment in accepting the challenges and opportunities for designing the formulations (CREATE)

04	Research Work	CO1	To recall the fundamentals, carry out literature review on proposed research topic and identify research problem (REMEMBER)
		CO2	To summarize the requirements as per the proposed research (UNDERSTAND)
		CO3	To construct the research hypothesis (CREATE)
		CO4	To design research experiments meticulously and documentation as per format (CREATE)
		CO5	To evaluate and conclude the results using statistical analysis (EVALUATE)
		CO6	To appraise societal application and appreciation (EVALUATE)

M.PHARMACY – IV SEMESTER (PCI)			
S.No	**Course name**	**Course number**	**Course outcome**
01	Journal club	CO1	To select the scientific concept based on literature and define the objectives of research (ANALYZE)
		CO2	To summarize the hypothesis and summarize the concept for presentation (UNDERSTAND)
		CO3	To discuss in a meeting, discuss SWOT analysis, the design and methods used in concept (UNDERSTAND)
		CO4	To analyze the variables and their inter relationships (ANALYZE)
		CO5	To conclude the results and to discuss its significance (EVALUATE)
		CO6	To appraise the concept for societal needs, acknowledge and improve presentation skills (EVALUATE)
02	Research Work	CO1	To recall the fundamentals, carry out literature review on proposed research topic and identify research problem (REMEMBER)
		CO2	To summarize the requirements as per the proposed research (UNDERSTAND)
		CO3	To construct the research hypothesis (CREATE)
		CO4	To design research experiments meticulously and documentation as per format (CREATE)
		CO5	To evaluate and conclude the results using statistical analysis (EVALUATE)
		CO6	To appraise societal application and appreciation (EVALUATE)
03	Discussion / Final Presentation	CO**1**	To recall the technical knowledge gained in the design and development of various formulations (REMEMBER)
		CO**2**	To compare and differentiate various pharmaceutical techniques involved in the nanotechnology and targeted drug delivery systems (ANALYZE)
		CO**3**	To develop communication skills and build various models basing on the knowledge acquired in the molecular pharmaceutics (CREATE)
		CO**4**	To test various hypothesis and develop problem solving skills in pilot development process (APPLY)

		CO**5**	To evaluate the pharmacokinetic parameters and synthesize modelling techniques based on the information available (EVALUATE)
		CO**6**	To create open minded environment in accepting the challenges and opportunities for designing the formulations (CREATE)
I M. PHARMACY(Pharmacology) – I SEMESTER (PCI)			
S.NO	Course name with code	Course number	Course outcome
1	Modern Pharmaceutical Analytical techniques (Theory) (MPL101T)	CO1	Recall and relate the instrumental methods of analysis such as electrochemical, spectroscopic, chromatographic and electrophoretic techniques with volumetric methods of analysis. (UNDERSTAND, ANALYSE)
		CO2	Demonstrate the interaction of EMR with matter and its phenomenon in various spectroscopic techniques; affinity of matter with stationary and mobile phase; temperature induced physical & chemical changes in matter; potential differences in sample solutions and to study various factors affecting the analysis. (REMEMBER, UNDERSTAND, EVALUATE)
		CO3	Identify and categorise organic and inorganic compounds with different functional groups and to understand their structure at atomic, ionic, group and molecular level to recommend an appropriate spectroscopic technique for analysis. (UNDERSTAND, EVALUATE, APPLY)
		CO4	Demonstrate the theory, principle, construction and working of instrument components and the methodology employed for the analysis of drugs in various samples. (UNDERSTAND)
		CO5	Illustrate X-ray crystallographic techniques, electrophoretic methods, thermal methods and electrochemical methods. (APPLY)
		CO6	Summarize the applications of various analytical techniques in relation to characterization, isolation, identification and estimation of various categories of compounds. (REMEMBER, APPLY, ANALYSE)
2	Advanced Pharmacology-I (Theory) (MPL102 T)	CO1	Describe the basic principles of pharmacokinetic and pharmacodynamic parameters of drugs,drug receptor interactions and elicited effect (REMEMBER)
		CO2	Summarize the various biogenesis pathways involved in synthesis of Neurotransmitters and their physiological role and to Illustrate pharmacology of Drugs acting on peripheral nervous system. (UNDERSTAND)
		CO3	Enumerate the pharmacology of drugs acting on central nervous system, General and local anaesthetics etc. (REMEMBER)
		CO4	Differentiate the relative pros and cons in the use of drugs for various cardiac complications. (ANALYZE)
		CO5	Appraise the drugs acting on hematopoietic system. (EVALUATE)
		CO6	Explain the role of autocoids and related drugs. (UNDERSTAND)

3	Pharmacological and Toxicological Screening Methods – I (Theory) (MPL103T)	CO1	Enumerate the basic knowledge on regulations and ethical requirement for the maintenance and breeding of laboratory animals and the role of transgenic animals in preclinical research, CPCSEA guidelines, GLP, Bioassays (REMEMBER)
		CO2	Predict General principles of in vivo, invitro, screening techniques for drugs acting on CNS and ANS (EVALUATE)
		CO3	Identify the newer screening methods and techniques for drug acting on respiratory, reproductive and gastrointestinal system. (REMEMBER)
		CO4	Demonstrate the screening methods for new Substances acting on cardiovascular system. (UNDERSTAND)
		CO5	Appraise the new screening methods of the newer drugs for metabolic disorders. (EVALUATE)
		CO6	Conclude and predict the in vivo, in vitro screening models for immune modulators, and to discuss General principles of immunoassay and extrapolation of in vitro/preclinical data to human. (EVALUATE)
4	Cellular and Molecular Pharmacology (Theory) (MPL 104 T)	CO1	Describe the basic structure and function of genome in the living organism and the importance of siRNA and micro- RNA, Gene mapping, Gene sequencing (REMEMBER)
		CO2	Summarize various phases of cell cycle, apoptosis, necrosis and autophagy (UNDERSTAND)
		CO3	Construct the role of intercellular and intracellular signalling pathways of receptors and secondary messengers in cell signalling pathways (CREATE)
		CO4	Appraise the principles and applications of genomic and proteomic tools DNA Electrophoresis, PCR, SDS page, ELISA western blotting, Recombinant DNA technology and Gene therapy. (EVALUATE)
		CO5	Analyse the significance of Pharmacogenomics and immunotherapeutic (ANALYZE)
		CO6	Build the various cell culture techniques, Principles and applications of cell viability/ glucose uptake/Calcium influx assays, flow cytometry and Biosimilars (CREATE)
5	Pharmacology Practical-I (Practical) (MPL105PA)	CO1	Recall various pharmacopeial compounds & their formulations, and to carry out their analysis using UV-VIS spectroscopy, HPLC, gas chromatography, fluorimetry, flame photometry and demonstrate the techniques for handling laboratory animals. (REMEMBER)
		CO2	Demonstrate the various routes of drug administration. (UNDERSTAND)
		CO3	Analyse the techniques of anaesthesia, euthanasia of experimental animals and understand blood sampling techniques. (ANALYZE)
		CO4	Asses and interpret functional battery tests like the modified Irwin test. (EVALUATE)
		CO5	Identify various techniques for the evaluation of anxiogenics, CNS stimulants, depressants, analgesic, miotic, aesthetic, anxiolytics, anticonvulsant, diuretic

			activity and show the evaluation of antiulcer activity by pylorus ligation method. (REMEMBER)
		CO6	Determine oral glucose tolerance assay. (APPLY)
6	Pharmacology Practical-II (Practical) (MPL105PB)	CO1	Demonstrate the isolation of RNA from yeast and identify DNA from sources like bacteria, cauliflower, onion, goat liver. (UNDERSTAND)
		CO2	Assess the estimation of protein by Braford/Lowy's method in samples, estimation of RNA/DNA by UV spectroscopy, amplification of gene by PCR and quantification of protein using western blotting. (EVALUATE)
		CO3	Describe different assays like some enzyme based in-vitro assays and cell viability assays. (REMEMBER)
		CO4	Assess DNA fragmentation assay by agarose gel electrophoresis, DNA damage study by Comet assay and determining apoptosis by fluorescent imaging. (EVALUATE)
		CO5	Analyse the pharmacokinetics profiles of drugs via different routes of administration and evaluating enzyme inhibition activity. (ANALYZE)
		CO6	Calculate the estimation of drugs in biological fluids and other biological samples using appropriate techniques like UV and HPLC(APPLY)
7	Seminars/ Assignments	CO1	Recall the fundamentals of proposed topic and carry out literature review. (REMEMBER)
		CO2	Classify/ compare, interpret the various methods and techniques (ANALYSE)
		CO3	Assemble the collected data in chronological order and develop writing skills (CREATE)
		CO4	Analyse the data and interpret the relationships (ANALYSE)
		CO5	Evaluate and conclude the given topic. (EVALUATE)
		CO6	Design research in given concept and improve presentation skills. (CREATE)

I M. PHARMACY(Pharmacology) – II SEMESTER (PCI)

S.NO	Course name with code	Course number	Course outcome
1	Advanced pharmacology-II (Theory) (MPL 201 T)	CO1	Describe the functions of hormones and to list out drugs acting on endocrine system, corticosteroids and calcium regulation. (REMEMBER)
		CO2	Summarize the principles of chemotherapy and illustrate the mechanism of action of antibiotics, Antifungal, antiviral, and anti-TB drugs. (UNDERSTAND)
		CO3	Appraise the chemotherapeutic agents for Protozoal Helminthic infections and cancer. (EVALUATE)
		CO4	Enumerate the inflammatory mediators, allergic /hypersensitivity reactions and simplify pharmacotherapy of asthma and COPD, Immunosuppressants and stimulants (REMEMBER)
		CO5	Assess the mechanism of drugs acting on GIT and applications of chrono pharmacology, applications of chronotherapy in various disease. (EVALUATE)

		CO6	Determine and elaborate the role of free radicals in etiopathology of various diseases and adapt the recent Advances in treatment of various diseases. (APPLY)
2	Pharmacological and toxicological screening methods-II(Theory) (MPL202T)	CO1	Recall types of toxicology, to list out the regulatory guide lines for conducting toxicity studies OECD, ICH, EPA and Schedule Y, and its importance in drug development. (REMEMBER)
		CO2	Determine Acute, sub-acute and chronic- oral, dermal and inhalational toxicity studies as per OECD guidelines. Acute eye, dermal irritation and skin sensitization studies. (APPLY)
		CO3	Construct reproductive toxicology, teratogenicity, Genotoxicity and In vivo carcinogenicity studies. (CREATE)
		CO4	Categorize IND enabling studies -Definition, Importance, Industry Perspective, list of studies for IND submission (ANALYSE)
		CO5	Summarize, and mention the importance of safety pharmacological studies, Tier1- CVS, CNS and respiratory safety pharmacology, HERG assay. Tier2- GI, renal and other studies. (Tier-1 and 2). (UNDERSTAND)
		CO6	Assemble the Importance and applications of toxicokinetic Studies and Alternative methods to animal toxicity testing. (CREATE)
3	Principles of Drug Discovery (Theory) (MPL203T)	CO1	Recall the modern drug discovery process, target Discovery and validation and role of transgenic animals in target validation, Lead identification and Lead Optimization, Bioinformatics. (REMEMBER)
		CO2	Relate the concepts of lead identification in combinatorial chemistry, high throughput screening and in silico lead discovery techniques. (ANALYSE)
		CO3	Identify the computational structure of prediction of protein structure and the NMR and X-ray crystallography in protein structure prediction. (REMEMBER)
		CO4	Contrast the Rational Drug Design Methods and Virtual Screening techniques. (ANALYSE)
		CO5	Interpret the various molecular Docking studies and to assess the importance of QSAR and SAR studies. (UNDERSTAND)
		CO6	Elaborate the Statistical methods used in QSAR-PLS,3D-QSAR(COMFA AND COMSIA) and compile the Prodrug design process. (APPLY)
4	Clinical Research and Pharmacovigilance (Theory) (MPL204T)	CO1	Recall various regulatory requirements for clinical trials, Ethical Committee for biomedical research and human participants, Schedule Y, ICMR and informed consent (REMEMBER)
		CO2	Formulate the types and designs of clinical trial and to infer roles and responsibilities of Clinical Trial Personnel. (CREATE)
		CO3	Construct the documentation process of clinical trials and to identify the possible Adverse Drug Reactions. (CREATE)
		CO4	Explain the roles and responsibilities of Pharmacovigilance. (UNDERSTAND)
		CO5	Appraise various methods of ADR reporting and tools used in Pharmacovigilance. (EVALUATE)

		CO6	Predict principles and concepts of Pharmacoepidemiology, Pharmacoeconomics and safety pharmacology. (EVALUATE)
5	Pharmacological Practical - III (Practical) (MPL205PA)	CO1	Demonstrate the dose response relationship, effect of agonist drugs on DRC. (UNDERSTAND)
		CO2	Illustrate the study of antagonist /potentiating agents on DRC using suitable isolated tissue preparation. (UNDERSTAND)
		CO3	Appraise the drug concentrations by various bioassay methods using isolated tissue preparations (EVALUATE)
		CO4	Calculate the PA2 values of various antagonists using isolated tissue preparations. (APPLY)
		CO5	Identify the effects of various drugs on isolated heart Preparations. (REMEMBER)
		CO6	Analyse the rat BP, heart rate and ECG. (ANALYZE)
6	Pharmacological Practical - IV (Practical) (MPL205PB)	CO1	Demonstrate the drug absorption studies by averted rat ileum preparation (UNDERSTAND)
		CO2	Enumerate the acute, subacute and chronic toxicity studies as per OECD guidelines. (REMEMBER)
		CO3	Calculate the Repeated dose toxicity studies-Serum biochemical, haematological, urine analysis (APPLY)
		CO4	Appraise Drug mutagenicity study using mice bone-marrow chromosomal aberration. (EVALUATE)
		CO5	Define Protocol for clinical trial, ADR monitoring (REMEMBER)
		CO6	Summarize In-silico docking studies/ pharmacophore-based screening/QSAR studies and ADR reporting (UNDERSTAND)
7	Seminars/Assignments	CO1	Recall the fundamentals of proposed topic and carry out literature review. (REMEMBER)
		CO2	Classify/ compare, interpret the various methods and techniques (ANALYSE)
		CO3	Assemble the collected data in chronological order and develop writing skills (CREATE)
		CO4	Analyse the data and interpret the relationships (ANALYSE)
		CO5	Evaluate and conclude the given topic. (EVALUATE)
		CO6	Design research in given concept and improve presentation skills. (CREATE)

II M. PHARMACY(Pharmacology) – III /IV SEMESTER (PCI)			
S.NO	Course Name	Course number	Course outcome
1	Research Methodology & Biostatistics (MRM301T)	CO1	Demonstrate the general research methodology including, study design and strategies to eliminate errors/bias (UNDERSTAND)
		CO2	Explain the importance of biostatistics in pharmacy: statistical tests of significance, non-parametric tests, null hypothesis, P values and degree of freedom (UNDERSTAND)
		CO3	Discuss the Medical Research regarding values in medical ethics, conflicts between autonomy and beneficence and criticisms of orthodox medical ethics (UNDERSTAND)
		CO4	Describe the ethics committees, online business practice, conflicts of interest and vendor relationships (UNDERSTAND)
		CO5	Explain the CPCSEA guidelines for laboratory animal facility (UNDERSTAND)
		CO6	Explain about the Declaration of Helsinki regarding basic principles for all medical research and medical research combined with medical care (UNDERSTAND)

2	Journal Club	CO1	Select the scientific concept based on literature and define the objectives of research.
		CO2	Outline the hypothesis and summarize the concept for presentation.
		CO3	Arrange for a meeting, discuss SOWT analysis, the design and methods used in concept.
		CO4	Categorize the variables and their inter relationships.
		CO5	Conclude the results and to discuss its significance.
		CO6	Evaluate the concept for societal needs, acknowledge and improve presentation skills.
3	Project Work	CO1	Enumerate the fundamentals, carry out literature review on proposed research topic and identify research problem.
		CO2	Discuss the requirements toper form the proposed research.
		CO3	Assemble the research hypothesis.
		CO4	Design and take part in research experiments meticulously and documentation as per format.
		CO5	Assess and conclude the results using statistical analysis.
		CO6	Conclude the societal application and appreciation.

II M. PHARMACY(Pharmacology) – IV SEMESTER (PCI)			
S.NO	Course Name	Course number	Course outcome
1	Journal Club	CO1	Select the scientific concept based on literature and define the objectives of research.
		CO2	Outline the hypothesis and summarize the concept for presentation.
		CO3	Arrange for a meeting, discuss SWOT analysis, the design and methods used in concept.
		CO4	Categorize the variables and their inter relationships.
		CO5	Conclude the results and to discuss its significance.
		CO6	Evaluate the concept for societal needs, acknowledge and improve presentation skills.
2	Discussion / Presentation (Proposal Presentation)	CO1	To recall the technical knowledge gained in the design and development of various Screening measures (REMEMBER)
		CO2	To compare and differentiate various pharmacological Procedures involved in the Toxicological Screening Methods (ANALYZE)
		CO3	To develop technical skills and build various models basing on the knowledge acquired in Principles of Drug Discovery (CREATE)
		CO4	Formulate the types and designs of clinical trial and to infer roles and responsibilities of Clinical Trial Personnel. (CREATE)
		CO5	To evaluate the Screening Procedures and develop various methods based on the information available (EVALUATE)
		CO6	To create open minded environment in accepting the challenges and opportunities for development and screening of Pharmacological activities. (CREATE)
3	Project Work	CO1	Enumerate the fundamentals, carry out literature review on proposed research topic and identify research problem.
		CO2	Discuss the requirements toper form the proposed research.
		CO3	Assemble the research hypothesis.
		CO4	Design and take part in research experiments meticulously and documentation as per format.
		CO5	Assess and conclude the results using statistical analysis.
		CO6	Conclude the societal application and appreciation.

PROGRAMME SPECIFIC OUTCOMES(PSOs)

B.PHARMACY

- PSO 1: Recognize the pharmacological and toxicological effects of synthetic and plant-based compounds in the detection, avoidance, and treatment of different disorders.
- PSO 2: To emphasise the importance of quality assurance and control in the development of medication design and formulation.
- PSO 3: Using knowledge of medicinal chemistry, Industrial pharmacy, analytical abilities, and pharmaceutical engineering to develop new dosage forms and drug delivery techniques to meet industrial demands.
- PSO 4. Apply the knowledge in drug laws for entrepreneurship development and marketing pertaining to drug distribution of all scheduled drugs and cosmetics.

PHARM D

- **PSO1** To Know the professional practice management skilln hospital pharmacies to comprehend various drug distribution techniques.
- **PSO2** To impart objective and trustworthy information to all health stakeholders who value practice-based research techniques, store management, and inventory control
- **PSO3** To create individualized treatment plans based on diagnosis, choosing a course of action and keeping track of side effects and clinical and laboratory measures of therapeutic response.
- **PSO4** To clarify patient care in completing medication histories and categorizing possible drug-related side effects of pharmacotherapy from laboratory data interpretations.
- **PSO5** To be able to design clinical study documents, manage data, monitor safety, and conduct clinical trials. To comprehend the clinical aspects of drug development, such as face, ethical concerns, roles, and responsibilities of clinical trials personnel.
- **PSO6** To provide effective patient-centered treatments to resolve therapeutic issues with the necessary medications and to explain the effects of the drug by critically evaluating scientific literature in order to improve the public's health and wellbeing.

PHARMACEUTICS (MPH)

PSO 1 Formulations strategies: To impart practical knowledge and skills to create disease formulations and targeting strategies using cutting-edge science for better patient care and compliance.

PSO 2 Emerging science: To establish knowledge about cutting-edge technologies that are just developing to emerge and how they might be applied to the pharmaceutical industry to create better treatment formulations.

PSO3 Computational literacy: To exemplify the need of artificial intelligence computer programs or software applications useful in screening formulations, interpretation of experimental data and their validation.

PSO 4 Pharmaceutical regulations: To acknowledge the objectives, roles, functions of various pharmaceutical regulatory agencies that regulate the quality, safety and efficacy of Pharmaceutical products from manufacturing to the patient's door.

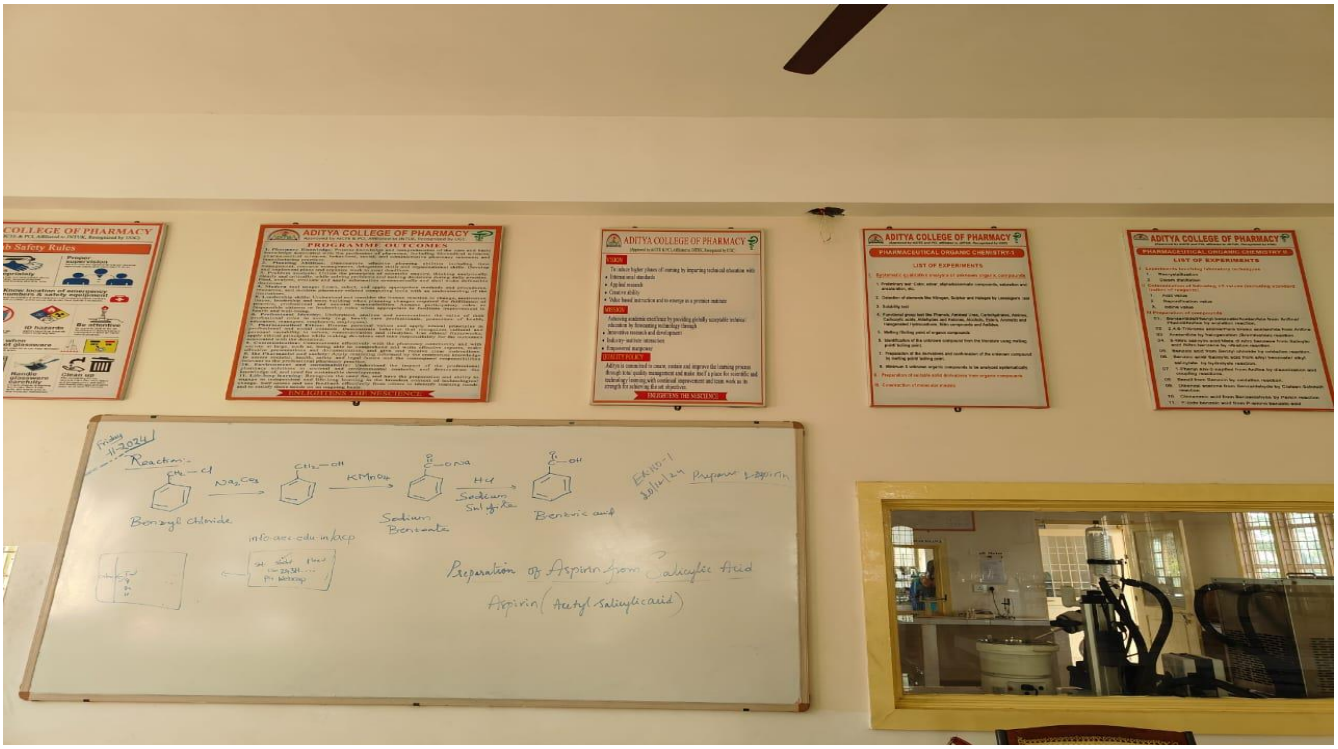
PHARMACOLOGY (MPL)

- **PSO 1 Integrative and Applied Learning:** An educational strategy that integrates preclinical experimentation with theoretical concepts through connections and relativity. Apply the knowledge and skills that learned in the traditional classroom to practical, real-world situations.
- **PSO 2 Biological research:** Demonstrate an understanding how drugs work by testing samples on isolated organs or using non-invasive in vitro and in vivo methods. The analysis and comparison of a product's initial toxicity and safety are results of biological research.
- **PSO 3 Technical Advancements:** Exhibit the use of various cutting-edge tools to analyze and evaluate the drug's potency using animals. develops cutting-edge screening techniques and industry standards to pinpoint and assess parameters for various pharmacological activities.
- **PSO 4 Ethical Reasoning:** Apply ethical principles to verify the results of the preclinical studies. Plan, carry out, and assess the procedures in accordance with CPCSEA recommendations. Enhance the functional skills and transparency by record keeping.
- **PSO 5 Employability**: To increase employability, gain in-depth knowledge of the life sciences and demonstrate critical thinking, problem solving, and decision making. Apply skill-based knowledge in a variety of fields and connect scientific advancement principles.

CLASS ROOM PO'S DISSEMINATION

Pharmacy Department PO'S Dissemination

LABORATORIES

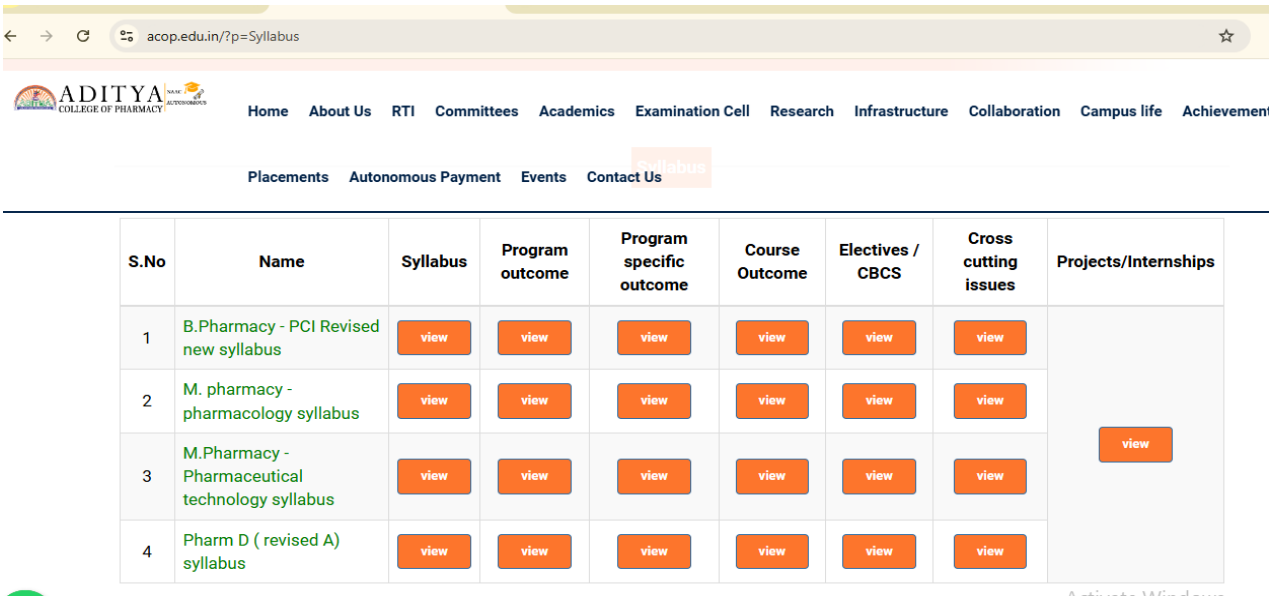


CORRIDORS


ADITYA COLLEGE OF PHARMACY
Approved by AICTE & PCI, Affiliated to JNTUK, Recognized by UGC
PROGRAMME 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; behavioral, 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, analyze, 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 fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.
6. Professional Identity: Understand, analyze and communicate the value of their profession 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 behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
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.
ENLIGHTENS THE NESCIENCE


PHARMACEUTICS LAB-I
ADITYA COLLEGE OF PHARMACY
PROGRAMME OUTCOMES
ENLIGHTENS THE NESCIENCE

CO'S DISSEMINATION IN COLLEGE WEBSITE



S.No	Name	Syllabus	Program outcome	Program specific outcome	Course Outcome	Electives / CBCS	Cross cutting issues	Projects/Internships
1	B.Pharmacy - PCI Revised new syllabus	view	view	view	view	view	view	view
2	M. pharmacy - pharmacology syllabus	view	view	view	view	view	view	
3	M.Pharmacy - Pharmaceutical technology syllabus	view	view	view	view	view	view	
4	Pharm D (revised A) syllabus	view	view	view	view	view	view	