CRITERIA 2

TEACHING LEARNING AND EVALUATION

2.6 STUDENT PERFORMANCE AND LEARNING OUTCOMES

Criteria: 2	Teaching- Learning and Evaluation
Key Indicator- 2.6	Student Performance and Learning Outcome
Metric No. 2.6.1	Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website and attainment of POs and COs are evaluated.

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Programme Educational Objectives (PEO) and Program Outcomes (PO)

Programme Educational Objectives

- **PEO 1**: To analyze and apply theoretical knowledge acquired in field pharmaceutical sciences.
- **PEO 2**: To demonstrate formulation skills along with quality attributes required as per given standard.
- **PEO 3**: To sensitize the need of society and act according to code of ethics.

Program Outcomes (B. Pharm)

- PO 1: **Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioural, social, and administrative pharmacy sciences; and manufacturing practices.
- PO 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.
- PO 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.
- PO 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.
- PO 5: **Leadership skills**: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfilment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well- being.

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- PO 6: **Professional Identity**: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).

- PO 7: **Pharmaceutical Ethics**: Honors personal values and apply ethical principles in professional and social contexts. Demonstrate behaviour that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks;

  apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

- PO 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.

- PO 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.

- PO 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.

- PO 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.

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP101T Human Anatomy and Physiology I Theory	CO1	To understand human body as whole by understanding tissue and cellular level organization and its mechanism in homeostasis.	3		2			2		2	2		2
	CO2	To characterize structure and function of skin, bones and joints.	3			2		2		2	2		3
	CO3	To analyze and differentiate the importance of blood and lymphatic system.	3		2			2		2	2		3
	CO4	To relate the physiology of sympathetic, Parasympathetic, Spinal/ Cranial nerves and organization of special senses.	3		2			2		2	2		3
	CO5	To appreciate and comprehend the anatomy and physiology of heart and blood vessels.	3					2		2	2		2
Average (2.23)			**3**		**2**	**2**		**2**		**2**	**2**		**2.6**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP107P Human Anatomy and Physiology I Practical	CO1	Identify microscopical features of various types of cells and tissues.	2	3	2			2			2		2
	CO2	Identify gross anatomy and physiology of various bones.	2	3	2			2			2		2
	CO3	Perform haematological tests and identify abnormalities associated with it.	2	3	2	3		2	2		2	2	3
	CO4	Appreciate coordinated working pattern of different organs of different system.	2	3	2			2			2		2
	CO5	To record BP, Heart rate and pulse rate	2	3	2	3		2	2		2		3
Average (2.26)			**2**	**3**	**2**	**3**		**2**	**2**		**2**	**2**	**2.4**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP102T Pharmaceutical Analysis I – Theory	CO1	Understand basic concepts of volumetric analysis and the errors involved in it.	3		2				2		2	2	3
	CO2	Understand acid-base titrations.	3		2	2		2	2		2	2	3
	CO3	Differentiate between various methods involved in precipitation and Complexometric titrations.	3		2	2		2	2		2	2	3
	CO4	Describe redox titrations, their principles, and applications.	3		2	2	2	2	2		2	2	
	CO5	Cultivate a fundamental understanding of electrochemical analytical techniques.	3		2		2	2	2		2	2	3
Average (2.22)			**3**		**2**	**2**	**2**	**2**	**2**		**2**	**2**	**3**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP108P Pharmaceutical Analysis I Practical	CO1	Determine limit test for various impurities.	3	3	1		2	2	2			2	2
	CO2	Perform preparation and standardization of various secondary standard substances.	3	3	2		2	2	2			2	2
	CO3	Construct assay of compounds along with standardization of titrants.	3	3	3		2	2	2			2	2
	CO4	Solve normality of a compound by electro-analytical methods.	3	3	2	3	2	2	2			2	2
	CO5	Estimate percent purity of various compounds by different volumetric techniques	3	3	1		2	2	2			2	2
Average (2.31)			**3**	**3**	**1.8**	**3**	**2**	**2**	**2**			**2**	**2**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP103T Pharmaceutics I Theory	CO1	Understand the history of dosage forms, prescription and Dose calculations involved in pharmacy profession	3		2			2	2	2		1	2
	CO2	Learn insights of pharmaceutical calculations, powders and liquid dosage forms formulations.	2		3	2		2	2	2		1	
	CO3	Distinguish monophonic and biphasic liquid dosage forms	3		2	2		2	2	2	1	1	2
	CO4	Describe suppositories as a dosage forms and pharmaceutical incompatibilities	2		2	3		2	2	2	2	1	2
	CO5	Categories semisolid dosage forms, excipients, uses and its evaluation	3		2	2		2	2	2		1	
Average (1,94)			**2.6**		**2.2**	**2.2**		**2**	**2**	**2**	**1.5**	**1**	**2**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP109P Pharmaceutics I Practical	CO1	Perform Monophasic liquid dosage forms	2			2	2	2	2	2	2		
	CO2	Formulate biphasic liquid dosage forms	3		2		2	2	2	2	2		2
	CO3	Acquire the knowledge about various pharmaceutical powders and their preparations	3			2	2	2	2	2	2		2
	CO4	Construct the semisolid preparations and suppositories	1		3		2	2	2	2	2		2
	CO5	Illustrate externally applied monophasic liquid dosage forms like gargles and mouthwashes.	2			2	2	2	2	2	2		1
Average (2.05)			**2.2**		**2.5**	**2**	**2**	**2**	**2**	**2**	**2**		**1.8**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP104T Pharmaceutical Inorganic Chemistry Theory	CO1	Explain the sources and methods of determination of impurities in inorganic pharmaceuticals	3		2		2	2	2		2	1	
	CO2	Describe the method of preparation, assay, properties, medicinal uses of acids, bases, buffers, dental products, extra and intracellular electrolytes.	3		2	2		2	2		2	1	3
	CO3	Distinguish the acidifiers, antacids and cathartics and antimicrobials.	3			2		3	2		2	1	3
	CO4	Classify the expectorants, emetics and hematinic, astringent, poison and antidote.	3			2		2	2		2	1	3
	CO5	Categories the properties, storage condition and composition of radio pharmaceuticals	3		2		2	3	2		2	1	3
Average (2.15)			**3**		**2**	**2**	**2**	**2.4**	**2**		**2**	**1**	**3**

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP110P Pharmaceutical Inorganic Chemistry – Practical	CO1	Detect and control impurities of different ions	3	3	3	2	2	2				2	3
	CO2	Identify different inorganic compound	3		2	1	2	2				2	3
	CO3	To perform purity test for inorganic compound	3	3	3	2	2	2				2	3
	CO4	Prepare different inorganic compound	3			3	2	2			2	2	3
	CO5	Detection of ions in inorganic compound	3		3	2	2	2				2	3
Average (2.5)			**3**	**3**	**2.8**	**2.7**	**2**	**2**			**2**	**2**	**3**

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Course code	Course outcome Students will be able to		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP105T Communication skills Theory	CO1	Communicate in all contexts Verbal Non-Verbal and written communication	2				2	3		3	2		
	CO2	Enhance one's communication abilities so that one can perform better at workplace.	2				2	2	2	3	2		3
	CO3	Improve reading, writing, and speaking abilities so they can communicate effectively.	2				2			3	2		3
	CO4	Face interviews requisite skills.	2				2	2		3	2		3
	CO5	Identify and apply benefits of group discussion.	2				2			3	2		3
Average (2.32)			**2**				**2**	**2.3**	**2**	**3**	**2**		**3**

Course code	Course outcome Students will be able to		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP111P Communication skills Practical	CO1	Engage people with common ethics.	2			2	2	3	2	3			
	CO2	Understand the importance of communication.	2			2	2	3	2	3			3
	CO3	Use figurative language for effective communication.	2			2	2	3	2	3			3
	CO4	Collaborate with peer team for effective interpersonal skills.	2			2	2	3	2	3			3
	CO5	Prepare reports, drafts, letters and formal emails.	2			2	2	3	2	3			3
Average (2.42)			**2**			**2**	**2**	**3**	**2**	**3**			**3**

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First Year B Pharm SEM II-C.B.G.S. (Choice Based Credit & Grading System)

Course code	Course outcome The student able to understand:		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP201T Human Anatomy and Physiology II Theory	CO1	Nervous system - various organs structure and function, neuron, neuroglia, neurotransmitters and diseases associated with it.	3		3		2	2	1	2	3	1	3
	CO2	Digestive system – its various organs structure and functions, also the formation and role of ATP, Creatinine Phosphate and BMR.	3		3		2	3	1	2	3	1	3
	CO3	Respiratory and urinary system- its various organs structure and functions.	3		3	2	2	2	1	2	3	2	3
	CO4	Endocrine system their disorders.	3		3	3	2	3	1	2	3	1	3
	CO5	Reproductive system, also introduction to genetics Chromosomes, genes and DNA, protein synthesis, genetic pattern of inheritance.	3		3	3	2	2	1	2	2	2	3
Average (2.37)			**3**		**3**	**2.6**	**2**	**2.8**	**1**	**2**	**2.8**	**1.5**	**3**

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Course code	Course outcome The student able to		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP207P Human Anatomy and Physiology II Theory	CO1	Understand the integumentary and special sense, nervous system, endocrine system using specimen, models, etc.,	3		3			2	1		3	1	3
	CO2	Understand digestive, respiratory, cardiovascular systems, urinary and reproductive Systems with the help of models, charts and specimens.	3		3			3	1		3	1	3
	CO3	Understand the general neurological examination, with the help of demonstration.	3		3	2		2	1		3	2	3
	CO4	Understand the visual acuity, reflex activity, total blood count by cell analyser with the help of demonstration.	3		3	3		3	1		3	1	3
	CO5	Understand the recording of body temperature, tidal volume and vital capacity, Permanent slides of vital organs and gonads. Recording of basal mass index.	3		3	3		2	1		2	2	3
Average (2.48)			**3**	**-**	**3**	**2.8**	**-**	**2.8**	**1**	**-**	**2.8**	**1.5**	**3**

Course Code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP202T Pharmaceutical Organic Chemistry I Theory	CO1	Student will able to identify the structure, common and IUPAC name of the organic compound, the type of isomerism	3		3	2		2	2		1		3
	CO2	Special emphasis on writes the reaction, name the reaction and orientation of reactions, method of preparation of compounds	3	2	2	2		2	2		1		3
	CO3	To account for knowledge regarding	3		2	2		2	2		1		3

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		reactivity/stability of compounds											
	CO4	Knowledge about the naming reactions of carbonyl compounds	3			2		2	2		1		3
	CO5	To understand Reactivity of organic compounds.	3		3	2		2	2		1		3
Average (2.18)			**3**	**2**	**2.5**	**2**		**2**	**2**		**1**		**3**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
BP208P Pharmaceutical Organic Chemistry I– Practical	CO1	Identify and perform qualitative analysis of different organic compound	3	3	3	2			2		2	2	3
	CO2	Detection of functional group of organic compounds	3		2	1			2		2	2	
	CO3	Identification of compound by M.P and B. P	3	3	3	2			2		2	2	1
	CO4	Prepare derivatives of different organic compound	3			3		2	2		2	2	
	CO5	Construct molecular models	3		3	2		2	2		2	2	
Average (2.3)			**3**	**3**	**2.7**	**2**		**2**	**2**		**2**	**2**	**2**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP203T Biochemistry Theory	CO1	To understand the fundamental concepts and characteristics of biomolecules and bioenergetics.	3		2	2		1	2	2	1	2	3
	CO2	A concise understanding of carbohydrate metabolism.	3		2	2		1	2			2	3
	CO3	Students will have a solid foundation in the biochemical processes and disorders related to lipid metabolism, amino acid metabolism, and the synthesis and significance of key biological substances.	3			2		2	2	2	2	2	3
	CO4	Students will have a solid foundation in the principles of nucleic acid metabolism and genetic information transfer, providing them with a comprehensive understanding of these fundamental biological processes.	3			2		2	2	2	2	2	3
	CO5	A comprehensive understanding of enzymes, their kinetics, inhibitors, regulation, applications, and the role of co-enzymes in biochemical processes.	3	2		2			2	2	2	2	3
Average (2.12)			**3**	**2**	**2**	**2**		**1.5**	**2**	**2**	**1.7**	**2**	**3**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP209P Biochemistry Practical	CO1	Qualitative and quantitative analysis of Carbohydrates and Proteins	3	3		2		2	2	1		2	2
	CO2	Qualitative analysis of urine for abnormal constituents	2			2		2	2	1		2	2
	CO3	Determination of blood creatinine, blood sugar, serum total cholesterol	2		3			2	2	1	2	2	
	CO4	Preparation of buffer solution and measurement of pH and Study of enzymatic hydrolysis of starch	2	2		2		2	2	1		2	2

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	CO5	Determination of Salivary amylase activity and Study of effect of Temperature and substrate concentration on it.		2	2	2		2	2	1		2	
Average (2.00)			**2.2**	**2.3**	**2.5**	**2**		**2**	**2**	**1**	**2**	**2**	**2**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
BP204T Pathophysiology Theory	**CO1**	Recall the principles of inflammation and cell injury.	3					1	2	2		2	3
	CO2	Understand the etiology and pathogenesis of diseases.	3		2			1	2	2	2	2	3
	CO3	Identify the complications of the diseases	3		2	2		1	2	2	3	2	3
	CO4	Have knowledge of sign and symptoms of diseases and their diagnostic procedures.	3		3			1	2	2		2	3
	CO5	Comprehend the pathophysiological state and diseased mechanism.	3					1	2	2	2	2	3
Average (2.17)			**3**		**2.3**	**2**		**1**	**2**	**2**	**2.3**	**2**	**3**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP205T Computer Applications in Pharmacy Theory	CO1	Recall the principles of inflammation and cell injury.	2	1		3		3	2	3	2		3
	CO2	Understand the etiology and pathogenesis of diseases.	3	1		3	2	2	2	3	2		3
	CO3	Identify the complications of the diseases	3			3			2	3	2		3
	CO4	Have knowledge of sign and symptoms of diseases and their diagnostic procedures.	3			3	2	2	2	3	2		3
	CO5	Comprehend the pathophysiological state and diseased mechanism.	2			3	2		2	3	2		3
Average (2.32)			2.6	1		3	2	2.3	2	3	2	-	3

Course code	Course outcome Students will be able to		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP210P Computer Applications in Pharmacy Practical	CO1	Design a concise questionnaire using a word.	2			3		2	3	2	2		2
	CO2	Create a basic HTML web page to display personal information.	2			3		2		3	2		3
	CO3	Using online tools for detailed information about the drug, including indications, dosage, contraindications, and adverse effects.	2			3		2		3	2		3
	CO4	Effectively create mailing labels using the Label Wizard feature in Microsoft Word.	2			3	2	2		3	2		3
	CO5	Effectively utilize MS Access to create and manage a patient database, design forms generate reports, create an invoice table	2			3		2		3	2		3
Average (2.4)			2			3	2	2		2.8	2		3

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP206T Environmental sciences Theory	CO1	Explain the different natural sources and role of individual in conservation of these sources	3		2			2		2	1	3	
	CO2	Describe the concept, structure, function and characteristics of different ecosystems	3		2			3		2	2	3	1
	CO3	Explain and distinguish pollution and different types of pollution	3		2					2	2	3	1
Average (2.15)			**3**		**2**			**2.5**		**2**	**1.6**	**3**	**1**

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Second Year B Pharm SEM III-C.B.G.S. (Choice Based Credit & Grading System)

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP301T Pharmaceutical Organic Chemistry II Theory	CO1	To understand the reactivity of organic compounds.	3					2	2	1		2	3
	CO2	Special emphasis on mechanisms and orientation of chemical reactions.	3					2	2	1		2	3
	CO3	To acquire knowledge about the electrophilic and nucleophilic reactions.	2		2			2	2	1		2	2
	CO4	Basic knowledge regarding general methods of preparation of organic compounds.	3		2			2	2	1		2	2
	CO5	Account for reactivity/stability of compounds	3					2	2	1		2	3
Average (2.05)			**2.8**		**2**			**2**	**2**	**1**		**2**	**2.6**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP305P Pharmaceutical Organic Chemistry II Practical	CO1	To know about method of Preparation of organic compounds.	3	1	2	1	2	2	2			2	3
	CO2	Know the medicinal uses and other applications of organic compounds	2		2		2	2	2			2	2
	CO3	Understand the principles/ mechanism of organic compounds	3		2	2	2	2	2			2	3
	CO4	Basic knowledge regarding Purification of Organic compound	3	1	1	1	2	2	2			2	3
	CO5	Understand the chemistry, chemical reactions and	3	2	1	1	2	2	2			2	3

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		analytical constant of fats and oils determining analytical constants										
Average (1.96)			**2.8**	**1.3**	**1.6**	**1.2**	**2**	**2**	**2**			**2**	**2.8**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
BP302T Physical Pharmaceutics I Theory	**CO1**	Explain the theories and principles of solubility of drug molecules in the designing the dosage forms	3		2	3		3	2		2		2
	CO2	Explain the use of physicochemical properties of drug and additives in the formulation of dosage forms.	3		3	2		3	2		2		2
	CO3	Explain properties surface active agents and principles of interfacial phenomena	3	3				3	2		2		2
	CO4	Explain different types of complexes, their applications and methods of detection of complexes	3	3				3	2		2		2
	CO5	Demonstrate the use of physicochemical properties in the formulation development and evaluation of dosage forms	3	2		3		3	2		2		2
Average (2.46)			**3**	**2.6**	**2.5**	**2.6**		**3**	**2**		**2**		**2**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP306P Physical Pharmaceutics I Practical	CO1	Explain the theories and principles of solubility of drug molecules in the designing the dosage forms	3		2	2	2		2			1	2
	CO2	Explain the use of physicochemical properties of drug and additives in the formulation of dosage forms.	3		3	2	2	3	2			1	2
	CO3	Explain properties surface active agents and principles of interfacial phenomena	3	3	3	2	2		2			1	2
	CO4	Explain different types of complexes, their applications and methods of detection of complexes	3	3		2	2	2	2			1	2
Average (2.23)			3	3	2.6	2	2	2.5	2			1	2

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP303T Pharmaceutical Microbiology Theory	CO1	To Understand methods of identification, cultivation, and preservation of various microorganisms	3		2				2		2	2	3
	CO2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry	3		2	2		2	2		2	2	3
	CO3	To learn sterility testing of pharmaceutical products.	3		2	2		2			2	2	3
	CO4	To isolate a pure culture of organisms from a mixed culture	3		2	2	2	2			2	2	
	CO5	To identify the morphology and chemical nature of bacteria	3		2		2	2			2	2	3
Average (2.22)			3		2	2	2	2	2		2	2	3

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP307P Pharmaceutical Microbiology Practical	CO1	To recognize the structure of bacteria and scope of microbiology in pharmaceutical industries.	3		2		2		2		2	2	3
	CO2	To explain the principles of biochemical test and understand about sterilization.	3		2	2	2	2	2		2	2	3
	CO3	To identify the morphology reproduction of fungi and virus and to aware about disinfectant and its bactericidal and bacteriostatic properties.	3		2	2	2	2			2	2	3
	CO4	To check the potency of antibiotic and vitamins and understand about aseptic area.	3		2	2	2	2			2	2	
	CO5	To understand about microbial spoilage and about the tissue culture.	3		2		2	2			2	2	3
Average (2.22)			**3**		**2**	**2**	**2**	**2**	**2**		**2**	**2**	**3**

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP304T Pharmaceutical Engineering Theory	CO1	Students are able to illustrate basics knowledge of unit operations used in Pharmaceutical Industry.	3	3	2	3		2	2				2
	CO2	Students are able to understand different process and equipment used in the Transfer of energy.	3	2	2	1		3	2			2	3
	CO3	Students are able to get insights to preserve foods and increase their shelf life by reducing the water content and water activity.	3	3	3	3		2	2		2	2	2
	CO4	Students are able to understand mechanisms of	3	3	3	2	1	2	1		2	2	3

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		separation by using various separation medium.										
	CO5	Students are able to identify which material more stable and which is more corrosion sensitive.	3	2	3	2	1	2	1		1	3	3
Average (2.25)			**3**	**2.6**	**2.6**	**2.2**	**1**	**2.2**	**1.6**		**2.5**	**2.2**	**2.6**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
BP308P Pharmaceutical Engineering Practical	**CO1**	To illustrate basics knowledge of unit operations used in Pharmaceutical Industry.	3	3	2	3	2	2	2			2	2
	CO2	To understand different process and equipment used in the Transfer of energy.	3	2	2	2		2	2			2	3
	CO3	To get insights to preserve foods and increase their shelf life by reducing the water content and water activity.	3	3	3	3		2	2			2	2
	CO4	To understand all mechanisms used in unit operations which are applicable in pharmaceutical industry.	3	3	3	2	1	2	2			2	3
	CO5	To understand a research-oriented perspective and able Apply knowledge on operation of pharmaceutical manufacturing equipment.	3	3	3	3	3	2	2			2	3
Average (2.4)			**3**	**2.8**	**2.6**	**2.6**	**2**	**2**	**2**			**2**	**2.6**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP401T Pharmaceutical Organic Chemistry III Theory	CO1	Understand and explain the concepts of optical, geometrical isomerism and stereo chemical aspects of organic compounds	3		3	3		2	3		2		3
	CO2	Utilise the concept of racemic mixture and methods of resolution of racemic mixture	2		2	2		2	3		2		2
	CO3	Understand Synthetic schemes for the heterocyclic compounds with medicinal uses and applications	2		2	2		2	2		2		2
	CO4	Explain the mechanisms involved in the oxidation, reduction and condensation reactions	2		2	2		2	2		2		2
	CO5	Acquire the knowledge of important named reaction	2		2	2		2	2		2		2
Average (2.17)			**2.2**		**2.2**	**2.2**		**2**	**2.4**		**2**		**2.2**

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP402T Medicinal Chemistry I Theory	CO1	To understand the basics of medicinal chemistry and physicochemical properties of drugs in relation to biological action	3		3			2	2		2	2	3
	CO2	Students should illustrate drugs acting on ANS, neurotransmitters, SAR and synthesis of sympathomimetic agents along with adrenergic agonist and antagonist	3		3	2		2	2		2		3
	CO3	Outline the drugs acting on parasympathetic system, its neurotransmitters, SAR and synthesis of agents along with	3		3	2		2	2		2		3

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		cholinergic agonist and antagonist											
	CO4	Distinguish the drugs acting on CNS as sedative and hypnotics, antipsychotics and anticonvulsants	3		3			2	2		2		3
	CO5	Compare the drugs acting on CNS as general anaesthetics, narcotic and non-narcotic antagonist and NSAIDs.	3		3	2		2	2		2		3
Average (2.37)			**3**		**3**	**2**		**2**	**2**		**2**	**2**	**3**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
BP406P Medicinal Chemistry I Practical	**CO1**	Understand and explain purification techniques of solvents/liquids and synthesized products by Fractional distillation and distillation under vacuum and recrystallization	3		3			2	2		2	2	3
	CO2	Understand and explain demonstration of reaction monitoring by TLC.	3		3	2		2	2		2	2	3
	CO3	Understand and explain conventional and green chemistry methods of synthesis for intermediates and drugs	3		3				2		2		3
	CO4	Explain the physiochemical characterization and recrystallization method of intermediate and drugs.	3		3				2			2	3
									2				
Average (2.37)			**3**		**3**	**2**		**2**	**2**		**2**	**2**	**3**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP403T Physical Pharmaceutics Theory	CO1	To categorize the dispersed systems and understand the properties and applications of colloidal dispersions.	3		1		2	2	2		2		2
	CO2	To understand the principles of rheology in the stabilization of dosage forms.	3		3	2	2	2	2		2		1
	CO3	To formulate and evaluate coarse dispersions making use of rheological and electrical properties.	3		3	2	2	2	2		2		1
	CO4	To understand properties of particles and apply them in dosage development.	3		3	2	2	2	2		2		2
	CO5	To get insights of reaction kinetics and chemical degradation of pharmaceutical products.	3	2	1	3	2	2	2		2		2
Average (2.44)			**3**	**2**	**2.2**	**2.2**	**2**	**2**	**2**		**2**		**1.6**

Course code	Course outcome Students will able to		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP407P Physical Pharmaceutics Practical	CO1	Categories the particles and determination of fundamental and derived properties of powders.	3	3	2	3	2		2	3	2		
	CO2	Determine the viscosity by using Ostwald's and Brookfield's viscometer.	3	2	2	2			2		2		3
	CO3	Understand and determine sedimentation volume and effects of suspending on suspensions.	3	3	3	3			2		2		2
	CO4	Distinguish and determine the rate constants.	3	3	3	2	1		3	3	2		3

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	CO5	Interpret the shelf life of a given formulation by accelerated stability studies.	3	3	3	3	3		3	3	2		3
Average (2.55)			**3**	**2.8**	**2.6**	**2.6**	**2**		**2.4**	**3**	**2**		**2.6**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO 4**	**PO5**	**PO 6**	**PO7**	**PO 8**	**PO9**	**PO10**	**PO11**
BP404T Pharmacology I – Theory	**CO1**	Understand basics of pharmacology, agonist & antagonists & Pharmacokinetics of drugs.	3		2			1	2		2		2
	CO2	Describe Pharmacodynamics, ADR, Drug interactions, new drugs discovery and clinical evaluation.	2	1		2			2				1
	CO3	Discuss the pharmacology of drugs acting on PNS	3	1	2	1		2	2		2		1
	CO4	Outline neuro humoral transmission in the C.N.S, anaesthetics, muscle relaxants, Alcohols, disulfiram and pharmacology of sedatives, hypnotics and Anti-epileptics	3		3	1	2	1	2				1
	CO5	Categories psychopharmacological agents, antiparkinsons, Antialzheimer's, Psychostimulants& Opioid pharmacology, drug addiction, abuse, tolerance and dependence.	3		1		1	2	2				1
Average (1.7)			**2.8**	**1**	**2**	**1.3**	**1.5**	**1.5**	**2**		**2**		**1.2**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP408P Pharmacology I – Practical	**CO1**	Analyze the different routes of drug administration in animals.	3		1	2		1	2		2		2
	CO2	Perform Common laboratory techniques.	2			2		1	2		2		1
	CO3	Examine the different animals and instruments used in experimental pharmacology.	2					2	2		2		1
	CO4	Investigate the animals as per CPCSEA guidelines.	2					2	2		2		
	CO5	Observe the effect of drugs on animals by simulated experiments.	2		2	1		2	2		2		1
Average (1.7)			**2.2**		**1.5**	**2.5**	**-**	**1.6**	**2**		**2**		**1.2**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP405T Pharmacognosy and Phytochemistry I Theory	**CO1**	Understand the pharmacognostic origin, its classification and Quality control of crude drug.	3	2	2	2		2	2		2		2
	CO2	Describe the techniques in the cultivation, processing, Storage, production and conservation of crude drug of Natural origin.	3	2	2	2		2	2		2	1	2
	CO3	Discuss the fundamental aspects of plant tissue culture.	3	2	2	1		2	2		2	1	2
	CO4	Get insight of various systems of Secondary metabolites	3	2	1	-		2	2		2		2
	CO5	To inculcate the knowledge of primary metabolites like carbohydrate, protein, enzymes, lipids, and marine Drugs.	3	2	2	1		2	2		2	1	2
Average (1.92)			**3**	**2**	**1.8**	**1.5**		**2**	**2**		**2**	**1**	**2**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP409P Pharmacognosy and Phytochemistry Practical	CO1	Analyze the crude drugs by chemical test and qualitative microscopical characters.	3	2	2	2	2	3	2			2	1
	CO2	Determine the quantitative microscopical characters	3	2	2	2	3	2	2			2	2
	CO3	Calculate the % purity of crude drugs by mean of ash value.	3	1	2	1	2	3	2		3	2	3
	CO4	Stabilize the crude drugs by maintaining the moisture content.	3	2	2	2	3	3	2			2	1
	CO5	Apply the knowledge of swelling and foaming ability of crude drug.	3	2	2	1	2	3	2		3	2	2
Average (2.21)			**3**	**1.5**	**2**	**1.6**	**2.4**	**2.8**	**2**		**3**	**2**	**1.8**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP501T Medicinal Chemistry II Theory	CO1	To understand the classification and categories of different medicinal drugs	3		3			2	2		2	2	3
	CO2	To understand the drug metabolic pathways, adverse effect and therapeutic value of drugs	3		3	2		2	2		2		3
	CO3	To know the structural activity relationship of different class of drugs	3		3			2	2		2		3
	CO4	Well, acquainted with the synthesis of some important class of drugs	3		3			2	2				3
	CO5	knowledge about the mechanism pathways of different class of medicinal compounds	3		3	2		2	2		2		3
Average (2.37)			3		3	2		2	2		2	2	3

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP502T Industrial Pharmacy I Theory	CO1	The students should be able to explain the properties and selection of excipients used in different dosage forms.	3						2		2	2	3
	CO2	Know the various pharmaceutical dosage forms and their manufacturing techniques.	3	3		2				2			3
	CO3	Explain the quality control and quality analysis of dosage forms.	2			2					2		
	CO4	Formulate solid, liquid, and semisolid dosage forms and evaluate them for their quality	2					2					3
	CO5	Explain the formulation and manufacturing of cosmetics.				2		2	2				3
Average (2.33)			3	3		2		2	2	2	2	2	3

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP506P Industrial Pharmacy I Practical	CO1	Learn Preformulation studies of drug.	3								2	2	2
	CO2	Learn the preparation, coating and evaluation of Drug.	3		2	2				2	2		
	CO3	Learn the preparation of capsule.	3		2					2	2		
	CO4	Learn the preparation of injection, cream, ointment	3			2	2				2		2
	CO5	Learn to determine Evaluation of Glass containers (as per IP)	3		2	2		2			2		2
Average (2.11)			**3**		**2**	**2**	**2**	**2**		**2**	**2**	**2**	**2**

Course code	Course outcome Students shall be able to		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP503T Pharmacology II Theory	CO1	Discuss the pharmacology of drugs acting on CVS	3		1	1		2			2	1	3
	CO2	Understand pharmacology of drugs acting on urinary system.	3		1	1		2			2	1	3
	CO3	Categories the different autocoid and related drugs.	3					1			1		3
	CO4	Describe pharmacology of drugs acting on endocrine system.	3		1	1		2			2	1	3
	CO5	Analyze the different bioassay method.	3		1	1		1		2	1		3
Average (1.77)			**3**		**1**	**1**		**1.6**		**2**	**1.6**	**1**	**3**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP507P Pharmacology II – Practical	CO1	Examine the different physiological salt solution used in in-vitro study.	3			2		1			1		3
	CO2	Isolate the different organs/tissues from the laboratory animals and observe action of drugs on their various receptor.	3			2		2	2		2	2	3
	CO3	Observe the effect of drugs on animals by simulated experiments.	3		1	2		2			2	2	3
	CO4	Perform the DRC and Bioassay.	3		1	2		2	2		2	2	3
	CO5	Determine the PA2 and PD2 value using Rat and Guinea pig.	3		1	2		1			1		3
Average (1.87)			**1.8**		**1**	**2**		**1.6**	**2**		**1.6**	**2**	**3**

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP504T Pharmacognosy and Phytochemistry II Theory	CO1	To Study and explain basic metabolic pathways and radioactive isotopes in biogenetic study	3			2	1		2	1	2	2	3
	CO2	To describe the biological source, chemical constituents Chemistry, medicinal uses of different secondary metabolites	3				1		2	1	2	2	3
	CO3	To design method of isolation, identification and analysis of phytoconstituents	3			3	1	2	2	1	2		3
	CO4	To illustrate methods for industrial production, estimation and utilization of phytoconstituents.	3			3	1		2	1		2	3
	CO5	To describe techniques of Extraction and isolation	3			3	1	2	2	1	2	2	3
Average (2.07)			**3**			**2.7**	**1**	**2**	**2**	**1**	**2**	**2**	**3**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP508P Pharmacognosy and Phytochemistry II Practical	**CO1**	Student should be able to identify and study macroscopic and microscopic characteristics of crude drug.	3		2	2	2		2	1		2	3
	CO2	Student should be able to extract and detect various secondary metabolites in plant	3		2	2	2	2	2	1	2	2	3
	CO3	Student should be able to perform separation of phytoconstituents	3			2	2	2	2	1	2	2	
	CO4	Student should be able to do analysis of crude drugs by chemical test	3		2	2	2	2	2	1		2	3
Average (2.1)			**3**		**2**	**2**	**2**	**2**	**2**	**1**	**2**	**2**	**3**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP505T Pharmaceutical Jurisprudence Theory	**CO1**	Pharmaceutical jurisprudence Know the Pharmaceutical legislations and their implications in the development and marketing	3		2	3	1		2	2	2		3
	CO2	Know various Indian pharmaceutical Acts, Laws and schedule	2		1	3			2	2	2	2	3
	CO3	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals	2	2		3	1		2	2	2		3

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	CO4	Know the code of ethics during the pharmaceutical practice	3		2	3	2		2	2	2	2	3
	CO5	Know the patent, trademark, and IPR	3	2	3	3			2	2	2	2	3
Average (2.19)			**2.6**	**2**	**2**	**3**	**1.3**		**2**	**2**	**2**	**2**	**3**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP601T Medicinal Chemistry III Theory	CO1	Understand basics of antibiotics, its classification and their stereochemistry along with SAR	3		2			2	1	1	3	1	3
	CO2	Get insight of prodrugs and antimalarials	3		2			2	1	1	3	1	3
	CO3	Classify and explain therapeutic applications of anti-tubercular, Urinary tract anti-infective agents and antiviral agents	3		2			2	1	1	3	1	3
	CO4	Categorize antifungal, antiprotozoal, anthelmintic and sulphonamides	3		2			2	1	1	3	1	3
	CO5	Outline and describe the rationale of drug designing, QSAR and combinatorial chemistry	3		2	3		2	1	1	2	1	3
Average (2.08)			**3**		**2**	**3**		**2**	**1**	**1**	**2.8**	**1**	**3**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP607P Medicinal chemistry III Practical	CO1	Synthesize various drugs and drug intermediates	3	3	3	3	2	2	1	1	2		3
	CO2	Apply green approaches or newer techniques in synthesis	3	3	3	3	2	2	1	1	2	2	3
	CO3	Perform assays on important drugs using various techniques	3	3	3	3	2	2	1	1	2		3
	CO4	Draw various structures and reactions	3	3		3		2	1	1	2		3
	CO5	Determine various important physicochemical parameters	3	3	3	3		2	1	1			3
Average (2.27)			**3**	**3**	**3**	**3**	**2**	**2**	**1**	**1**	**2**	**2**	**3**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP602T Pharma Cology III Theory	CO1	The student able to understand the pharmacology of drug acting on respiratory system and gastrointestinal tract.	3		2			2	1	2	3	1	3
	CO2	The student able to get insight of chemotherapy and classify bacteriostatic and bactericidal agents.	3		2			2	1	2	3	1	3
	CO3	The student able to outline chemotherapeutic agents for various pathological conditions.	3		2			2	1	2	3	1	3
	CO4	The students able to categories various immune-pharmacological agents.	3		2			2	1	2	3	1	3
	CO5	To comprehend the principle of toxicology and treatment of poisoning along with Chrono-pharmacology.	3		2	3		2	1	2	2	1	3
Average (2.2)			**3**		**2**	**3**		**2**	**1**	**2**	**2.8**	**1**	**3**

Course code	Course outcome The student able to		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP608P Pharma Cology III Practical	CO1	Perform dose calculation in pharmacological experiments	3	3	3	3	2		1	1	1	2	3
	CO2	Demonstrate the effect of drug on GI motility, agonist and antagonist activity, saline purgative and insulin hypoglycaemic effect on animals.	3	3	3	3	2		1	1	1	2	3
	CO3	Estimate serum biochemical parameters and quantify pyrogens.	3	3	3	3	2		1	1	1	2	3
	CO4	Determine acute oral toxicity, acute skin irritation and acute eye irritation of a test	3	3	3				1	1	2	2	3

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		substance.											
	CO5	Calculate pharmacokinetic parameter from given data and biostatistics application to experimental pharmacology.	3	3	3	3			1	1	1	2	3
Average (2.22)			**3**	**3**	**3**	**3**	**2**		**1**	**1**	**1.2**	**2**	**3**

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP603T HDT Theory	CO1	Understand herb as raw material their biodynamic practices and Indian system of Medicine to herbal drug product.	3					1	2		2	2	2
	CO2	Get insights of various plant as medicine and herbal drugs and herb food interaction	3		2	2		1	2	2		2	2
	CO3	Describe herbs as raw materials for the preparation of cosmetics, excipients, conventional herbal formulations, and novel dosage forms like phytosomes.	3		2			1	2		2	2	3
	CO4	Know the WHO and ICH guidelines for the assessment, patenting, regulatory requirements and the issues of herbal drugs.	3					1	2			2	2
	CO5	Explain the present status and prospects of the herbal drug-based industry and components for Good Manufacturing Practice for Indian systems ofmedicine.	3					2	2	2		2	2
Average (2.02)			**3**		**2**	**2**		**1.2**	**2**	**2**	**2**	**2**	**2**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP609P HDT Practical	CO1	Learn phytochemical screening of crude drugs and learn the alcohol content of Asava and Arista	3								2	2	2
	CO2	Learn the evaluation of excipients of natural origin	3		2	2				2		2	
	CO3	Learn the incorporation of prepared and standardized extracts in various formulation and their evaluation.	3		2					2		2	
	CO4	Learn the monograph analysis of herbal drugs from pharmacopoeias.	3			2						2	2
	CO5	Learn to determine Aldehyde, Phenol and alkaloid content	3		2	2		2				2	2
Average (2.12)			**3**		**2**	**2**		**2**		**2**	**2**	**2**	**2**

Course code	Course outcome Students are able to		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP604T BPPK Theory	CO1	Illustrate basics of Biopharmaceutics and cellular absorption & and distribution mechanisms	3					3	2		2		3
	CO2	Understand metabolic pathways of drug disposition & Bioavailability and Bioequivalence studies.	3					3	2	2			3
	CO3	Get insights of pharmacokinetics & its mathematical derivations of drug kinetics.	3		3	1		3	2	2	2		2
	CO4	Design dosage regimen in multi-compartment models.	3		3	1		3	2	2	2		2
	CO5	Explain non-linear pharmacokinetics & its genesis	3		3	1		3	2	2	2		3
Average (2.32)			**3**		**3**	**1**		**3**	**2**	**2**	**2**		**2.6**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP605T Pharmaceutical Biotechnology Theory	CO1	To apply the principles of biosensors, immobilized enzyme and protein engineering in pharmaceutical industry.	3		2				2	1		2	3
	CO2	To acquire knowledge in basic principles of genetic engineering and enzyme technology and explain the concepts of rDNA technology and its applications.	3		2	2		2	2	1		2	3
	CO3	To understand the basic concepts of immunology and its applications for diagnosis in medical field.	3		2	2		2		1	2	2	3
	CO4	To recognize the concepts of genetics and understand types of mutation.	3		2	2	2	2		1		2	
	CO5	To design the ideal fermenter and understand the concept of fermentation.	3		2		2	2		1		2	3
Average (2.1)			**3**		**2**	**2**	**2**	**2**	**2**	**1**	**2**	**2**	**3**

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Course code	Course outcome Students will be able to		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP606T Quality Assurance Theory	CO1	Understand quality assurance by means of TQM, associated ICH guidelines and quality certification.	3	2	1					2			3
	CO2	Comprehend all organisational requirements like Personnel, premises, equipment's and material management.	3		2	2	3			2		2	3
	CO3	Categories quality control test for container and closure and GLP system.	3		2	2				2	2	2	3
	CO4	Design document records, SOPs, reports and complains assessment procedure.	3	2	2					2			3
	CO5	Perform calibration and validation of analytical instruments.	3	3	3	3							3
Average (2.14)			**3**	**2.3**	**2**	**2.3**	**3**			**2**	**2**	**2**	**3**

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Final Year B Pharm SEM VII-C.B.G.S. (Choice Based Credit & Grading System)

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP701T Instrumental Methods of Analysis Theory	CO1	Explain theoretical principle, instrumentation of UV Spectroscopy and Fluorimeter	3		2			2	1	1	3	1	3
	CO2	Get insight of IR spectroscopy, flame photometer, AAS and Nepheloturbidometry	3		2			2	1	1	3	1	3
	CO3	Learn basic principles and types of chromatography and separation techniques	3		2			2	1	1	3	1	3
	CO4	Describe the theory and instrumentation of GC and HPLC	3		2	3		2	1	1	3	1	3
	CO5	Understand separation of compounds using chromatographic techniques like ion exchange chromatography, gel chromatography and affinity chromatography	3		2	3		2	1	1	2	1	3
Average (2.08)			**3**		**2**	**3**		**2**	**1**	**1**	**2.8**	**1**	**3**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP705P Instrumental Methods of Analysis Practical	CO1	Apply knowledge of principle and working of instrument	3	3	3	3		2		3	2		2
	CO2	Perform assays on important drugs using various techniques	3	3	3	3		2		3	2	2	2
	CO3	Separate various amino acids and plant pigments using chromatographic techniques	3	3	3	3		2			2		2
	CO4	Understand working and instrumentation of GC and HPLC	3	3	3	3		2		3	2		2
	CO5	Apply knowledge of principle and working of instrument	3	3	3	3		2			2		2
Average (2.55)			**3**	**3**	**3**	**3**		**2**		**3**	**2**	**2**	**2**

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP702T Industrial Pharmacy II Theory	CO1	Understand the Process of Pilot plant scale up of pharmaceutical dosage forms	3			2			2	1	2		3
	CO2	Demonstrate the Practice and the Process of Technology transfer from lab scale to commercial	3		2				2	1	2		3
	CO3	Describe the roles and responsibilities of Regulatory agencies in the approval of drug.	3			2			2	1	2		3
	CO4	Discuss the guidelines for Technology Transfer	3		3				2	1	2		3
	CO5	Explain the different laws and acts that regulate the pharmaceutical Industry.	3			2			2	1	2		3
Average (2.21)			**3**		**2.5**				**2**	**1**	**2**		**3**

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Course code	Course outcome Students shall be able to		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP703T Pharmacy Practice Theory	CO1	Showcase their understanding and capacity to apply therapeutic principles, quality enhancement, effective communication, economic considerations, health behaviour, social and administrative factors, health policy, and legal matters in the field of pharmacy practice.	3		2		3	2	2	2	3		2
	CO2	Apply their knowledge of hospital drug distribution methods to their pharmacy practice.	3	2	2				3		3		2
	CO3	Proficiently implement principles of pharmacy management and inventory control to optimize medication usage.	3		2	2	2		2		3		3
	CO4	Will offer patient-centred care to a wide range of patients by utilizing the most up-to-date evidence, overseeing patient drug therapy through medication chart reviews, conducting medication history interviews, providing patient counselling, and identifying drug-related issue.	3		2		3	2	2	2	3		2
	CO5	Demonstrate their commitment to professional ethics by promoting safe and appropriate medication use in the community.	2				3	3	3	3	3		2
Average (2.37)			2.8	2	2	2	2.7	2.3	2.4	2.3	3		2.2

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP704T Novel Drug Delivery System Theory	CO1	Understand physiochemical and biological properties of drugs and polymer application relevant controlled release formulation.	3	2	2	2	2	1	3	-	-	-	3
	CO2	Describe the technique in formulation and development of mucosal and implantable drug delivery system	3	2	2	2	3	1	3	-	-	1	3
	CO3	Discuss the fundamental approaches of transdermal, nasopulmonary drug delivery system	3	1	2	1	2	1	2	-	3	1	3
	CO4	Insight of targeted drug delivery system for treatment of different diseases and disorders.	3	2	2	2	3	1	2	-	-	-	3
	CO5	Inculcate the knowledge of ocular and intrauterine drug delivery system for human health wellness.	3	2	2	1	2	1	2	-	3	1	3
Average (2.07)			**3**	**1.5**	**2**	**1.6**	**2.2**	**1**	**2.4**		**3**	**1**	**3**

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Final Year B Pharm SEM VIII-C.B.G.S. (Choice Based Credit & Grading System)

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP801T Biostatistics and Research Methodology	CO1	Explain and apply principles of research and biostatistics in research project.	3	2	1	2	2		1	2	2		3
	CO2	Describe about population & sample, study design, sample size calculation, numeric data and distribution of data.	3	2		2			1	2	2		3
	CO3	Use appropriate statistical test for analyses of data using SPSS in the research project.	3		3	2			1		2		2
	CO4	To understand the term probability & understand the concept of probability.	3			2			1		2		2
	CO5	To understand the term correlation & regression & be able to calculate correlation coefficient for a series data & Be able to decide when to apply multivariate analysis.	3	2	3	2			1		2		3
Average (2.1)			**3**	**2**	**2.3**	**2**	**2**		**1**	**2**	**2**		**2.6**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP802T Social and Preventive Pharmacy	**CO1**	To recognize the concepts and evaluation of public health in the form of nutrition factor and sociocultural factor which in the form of personal hygiene and habits.	3		2				2	1	2	2	3
	CO2	To explain the principles on the prevention and control of communicable and non-communicable diseases.	3		2	2		2	2	1	2		3
	CO3	To identify National health programs its objectives functioning and outcomes.	3		2	2		2		1	2		3
	CO4	To explain general measures and strategies to be followed in social and preventive pharmacy.	3		2	2	2	2		1	2		
	CO5	To recognize the community services in rural area, urban area and about school health.	3		2		2	2		1	2		3
Average (2.1)			**3**		**2**	**2**	**2**	**2**	**2**	**1**	**2**	**2**	**3**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP805ET Pharmaco vigilance	**CO1**	The student able to understand the pharmacology of drug and their uses and adverse drug reaction.	3		2			2	1	2	3	1	3
	CO2	The student able to get insight of Patient Adverse drug reaction data.	3		2	2		2	1	2	3	1	3
	CO3	The student able to outline Adverse drug reaction data. and WHO guidelines for various types of disease.	3		2			2	1	2	3	1	3
	CO4	The students able to categories Pharmacovigilance report.	3		2			2	1	2	3	1	3

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	CO5	To comprehend the principle of Key study regarding diseases-oriented data. various types of medical literature sites. Patients report.	3		2	2		2	1	2	2	1	3
Average (2.08)			**3**		**2**	**2**		**2**	**1**	**2**	**2.8**	**1**	**3**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
BP811ET Advanced Instrumention Techniques	**CO1**	Restate the basics of NMR & MS & can interpret its spectrum.	2		3	3		2	2	1			3
	CO2	Understand the thermal methods of drug analysis & x-ray crystallography.	2		3	3		2	2	1			3
	CO3	Examine the ICH & USFDA guidelines of calibration & validation & its use for various instruments used in drug analysis.	2		3	3		2	2	1			3
	CO4	Get insights of radio immune assay & various extraction techniques.	2		3	3		2	2	1			3
	CO5	Illustrate various hyphenated techniques for separation & analysis of drug.	2		3	3		2	2	1			3
Average (2.28)			**2**		**3**	**3**		**2**	**2**	**1**			**3**

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CRITERIA 2

TEACHING LEARNING AND EVALUATION

2.6 STUDENT PERFORMANCE AND LEARNING OUTCOMES

Criteria: 2	Teaching- Learning and Evaluation
Key Indicator- 2.6	Student Performance and Learning Outcome
Metric No. 2.6.1	Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website and attainment of POs and COs are evaluated.

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Programme Specific outcomes (PSOs) Program:

M. Pharm in Pharmaceutics

PSO 1. To acquire, understand and apply knowledge of novel and advanced drug delivery systems and its pharmacokinetics.

PSO 2. To develop innovator dosage form by identifying and resolving the research problems by utilizing acquired technical skills.

PSO 3. To nurture the technical and soft skills within the student for professional development undertaken.

Programme Specific outcomes (PSOs) Program:

M. Pharm in Pharmaceutical Chemistry

PSO 1. To deal with various advanced instrumental techniques for Quantification, Interpretation, characterization of novel and exiting drugs

PSO 2. To impart knowledge on single step and multi-step synthetic reactions, identification and interpretation of intermediates and conversion into final products.

PSO 3. To create a talent pool by involving students in research projects and to make students undertake small and large research projects/grants under faculty guidance for higher qualification.

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Programme Specific outcomes (PSOs) Program:

M. Pharm in Quality Assurance

PSO 1. To develop an ability to undertake multidisciplinary tasks in the pharmaceutical quality assurance system.

PSO 2. To analyze, criticize, organize, improvise and manage documents, data and information related to pharmaceutical production process and pharmaceutical quality assurance.

PSO 3. To deal with various advanced instrumental techniques for identification, characterization, and quantification of drugs and product.

PSO 4. To understand validation and its application in industry, their methodologies and application in manufacturing processes.

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M Pharm SEM I and SEM II-C.B.G.S. (Choice Based Credit & Grading System)

Pharmaceutics

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPH 101T Modern Pharmaceutical Analytical Techniques Theory	CO1	Restate the basics of spectroscopy & can interpret its spectrum.	2		1	3		2	2		2		2
	CO2	Understand the Nuclear Magnetic Resonance	2		1	3		2	2		2		2
	CO3	Examine the mass spectrometry its use for drug analysis.	2		1	3		2	2		2		2
	CO4	Get insights of Chromatography& various chromatographic techniques.	2		1	3		2	2		2		2
	CO5	Illustrate various Electrophoresis techniques for separation & analysis of drug.	2		1	3		2	2		2		2
Average (2.00)			**2**		**1**	**3**		**2**	**2**		**2**		**2**

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Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPH 102T Drug Delivery System Theory	CO1	Accomplish the fundamentals of modified drug delivery systems and apply various design approaches for its formulation development for oral sustained and gastro protective drug delivery systems	3		3	2		2	2		2	2	3
	CO2	Deliberate the concepts of ocular and transdermal delivery systems and its formulation with recent advancements.	3		3	2		2	2		2	2	3
	CO3	Understand the strategies of designing protein and peptide and vaccine delivery systems	3		3	2		2	2		2	2	3
Average (2.37)			**3**		**3**	**2**		**2**	**2**		**2**	**2**	**3**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPH 103T Modern Pharmaceutics Theory	CO1	Understand the insights of Preformulation and optimization studies and its role in formulation development	3	2	3	2		2	2		2		3
	CO2	Comprehend total Quality Management, different validation and calibration Methods as per regulatory guidelines for the analytical equipment and instruments and Good Manufacturing Procedures in order to obtain a quality product	3	2	3	2		2	2		2		3
	CO3	Know the fundamental physical concepts and processes involved in tabletting and to comprehend	3	2	3	2		2	2		2		3

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		the role of dissolution studies and its interpretation for understanding drug release kinetics.										
Average (2.37)			**3**	**2**	**3**	**2**		**2**	**2**		**2**		**3**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPH 104T Regulatory Affairs Theory	**CO1**	Understand the concepts of innovator and generic drugs and drug development process.	2	3		3	2	3	2		3	3	3
	CO2	Gain imperative knowledge on the Regulatory guidance's and guidelines for filing applications and approval process, preparation of dossiers and their submission to regulatory agencies in different countries.	3	2		3	3	3	3		2	3	3
	CO3	Expands the knowledge on post approval regulatory requirements for actives and drug products	3	3		3	3	3	3		3	2	3
	CO4	Gain idea on global documents in CTD/ eCTD formats	3	3		3	3	3	3		3	3	3
	CO5	Develop an understanding on clinical trials requirements for approvals to conduct clinical trials, importance of pharmacovigilance and process of monitoring in clinical trials.	2	3		3	3	3	2		3	2	3
Average (2.8)			**2.6**	**2.8**		**3**	**2.8**	**3**	**2.6**		**2.8**	**2.6**	**3**

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Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPH 105 P Pharmaceutics Practical - I Practical	**CO1**	Examine various compounds and their formulations by using UV-visible spectrophotometer, column chromatography, HPLC, Gas chromatography, fluorimetry & Flame photometry.	3	3	2	2		2	2		1	1	3
	CO2	Preparation and evaluation of Floating DDS-hydro dynamically balanced Drug delivery system	3	3	2	2		2	2		1	1	3
	CO3	Conduct Preformulation studies of different types of tablets and estimations of various drugs using different methods	3	3	2	2		2	2		1	1	3
Average (2.11)			**3**	**3**	**2**	**2**		**2**	**2**		**1**	**1**	**3**

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPH 201T Molecular Pharmaceutics Theory	**CO1**	Understand the various approaches for development of Novel Drug delivery system	3	3	1	1	2	1			2		2
	CO2	The Criteria for selection of drugs and polymers for development of NTDS	3	3	1	1	1	1			2		2
	CO3	Learn the different methods for creating new carrier for delivery of drugs	3	1	1	2	1	3			1		2
	CO4	know the formulation and evaluation of Novel Dosage forms	1	2	3	1	1	1			3		2
	CO5	Understand Creation and assessment of innovative drug delivery system.	2	2	1	2	1	3			1		1
Average (1.75)			**2.4**	**2.2**	**1.4**	**1.4**	**1.2**	**1.8**			**1.8**		**1.8**

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Course Code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPH 202T Advanced Biopharmaceutics and Pharmacokinetics Theory	CO1	Understand the concepts of drug absorption from GIT and biopharmaceutical considerations in drug product design and in vitro drug product performance	3		2	2		3	2		1		2
	CO2	Comprehend the basic concepts of pharmacokinetics and the calculate and interpret data using pharmacokinetic models for predicting ADME	3		2	2		3	2		1		2
	CO3	Apply the concept of pharmacokinetics in design and evaluation of modified release, targeted and biotechnological products.	3		3	2		3	2		1		3
Average (2.22)			**3**		**2.3**	**2**		**3**	**2**		**1**		**2.3**

Course code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPH 203T Computer Aided Drug Delivery system Theory	CO1	Understand the principles and techniques of computational modelling of drug disposition.	3			3		2	2		1		3
	CO2	Comprehend the principles and techniques of computer-aided formulation development.	3			3		2	2		1		3
	CO3	Gain knowledge of the principles and techniques of computer-aided biopharmaceutical characterization and computer Simulations in Pharmacokinetics and Pharmacodynamics	3			3		2	2		1		3

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	CO4	Acquire knowledge of the role and applications of AI, robotics and computational fluid dynamics in pharmaceutical development	3			3		2	2		1		3
	CO5	Understand the principles and techniques of computational modelling of drug disposition.	3			3		2	2		1		3
Average (2.33)			**3**			**3**		**2**	**2**		**1**		**3**

Course Code	**Course outcome** Students will be able to		**CO TO PO Mapping**									
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPH 204T **Cosmetic and cosmeceuticals** Theory	**CO1**	Learn about Key ingredients used in cosmetics and cosmeceuticals.	3	3	1	1	3	1		1	2		
	CO2	Gain the knowledge about Key building blocks for various formulations	3	3	1	1	1	1		1	3		3
	CO3	Analyze Current technologies in the market to develop cosmetic products.	3	1	1	2	1	3		1	1		2
	CO4	Know Various key ingredients and basic science to develop cosmetics and cosmeceutical	2	2	3	1	1	2		1	3		2
	CO5	Acquire scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.	2	2	1	2	1	3		2	1		2
Average (1.84)			**2.6**	**2.2**	**1.4**	**1.4**	**1.4**	**2**		**1.2**	**2**		**2.4**

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Course Code	Course outcome Students will be able to		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPH 205 P Pharmaceutics Practical II Practical	CO1	To compare the effect of temperature change, non-solvent addition and incompatible polymer addition in preparation of Microsphere.	3	3	2	3		2	2			2	3
	CO2	Development preparation and evaluation of Alginate beads.	3	3	2	3		2	2			2	3
	CO3	To prepare and evaluate Gelatin /Albumin microspheres, Liposomes, Neosomes and spherules	3	3	2	3		2	2			2	3
	CO4	To Understand DoE using design expert software and formulation data analysis.	3	3	2	3		2	2			2	3
	CO5	Development and evaluation of creams, shampoo, toothpaste base.	3	3	2	3		2	2			2	3
Average (2.5)			3	3	2	3		2	2			2	3

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M Pharm SEM I and SEM II-C.B.G.S. (Choice Based Credit & Grading System)

Pharmaceutical Chemistry

Course code	Course outcome The student able to understand:		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPC102T Advanced Organic Chemistry Theory	CO1	Principles and Applications of Retrosynthesis	3	2		3		2	2		2	3	3
	CO2	Mechanism and Applications of various named reactions	3	2				2	2		2	2	3
	CO3	Various catalysts used in different organic reactions	3	2	3	3			2			3	3
	CO4	To develop synthetic route for small molecules by carrying out an organic reaction, including isolating, purifying, and characterizing the product	3	3	3	3			2		2	3	3
Average (2.65)			3	2.2	3	3		2	2		3	2.7	3

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MPC103T Advanced Medicinal Chemistry Theory	CO1	Understand the processes involved in the design, development and discovery of medicinal compounds	3	3	3	3		2	2		2	3	3
	CO2	Study on different biological targets	3	2	2	3		2	2			2	3
	CO3	Anticonvulsant, H1/H2 receptor antagonistic, COX1 & COX2 inhibiting, adrenergic & cholinergic, antineoplastic and antiviral agents.	3		2	2		2	2		2	3	3
	CO4	Various strategies to design and develop new drug like	3	3	3	3			2		2	3	3

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		molecules for biological targets											
Average (2.5)			**3**	**2.6**	**2.5**	**2.7**		**2**	**2**		**2**	**2.7**	**3**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPC104T Chemistry of natural products Theory	**CO1**	To attain detailed knowledge about chemistry of medicinal compounds from natural origin.	3	2		2		2	2		2	3	3
	CO2	General methods of structural elucidation of compounds	3	3	3	3		2	2		2		3
	CO3	The concept of rDNA technology tool for new drug discovery	3	2	2.	3		2	2		2	2	3
	CO4	To identify different types of natural products, their occurrence, structure, biosynthesis and properties.	3	2	2	3		2	2		2	3	3
Average (2.42)			**3**	**2.2**	**2.3**	**2.7**		**2**	**2**		**2**	**2.6**	**3**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPC 105 P Pharmaceutical Chemistry Practical I	**CO1**	Perform Analysis of Pharmacopeial compounds and their formulations by spectrophotometer and chromatography	3	3	3	3	3	-	3	-	2	2	3
	CO2	Synthesize and characterize organic compounds of medicinal importance	3	3	3	3	3	-	3	-	2	3	3
	CO3	Estimate elements and functional groups in organic and natural compound and analyze these using spectroscopic techniques	3	3	3	3	3	-	2	-	2	2	3

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	CO4	To learn and understand mechanism of synthetic reactions.	3	3	3	3	2	-	2	-	2	2	3
Average (2.71)			**3**	**3**	**3**	**3**	**2.7**	-	**2.5**	-	**2**	**2.2**	**3**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPC201T Advanced Spectral Analysis Theory	**CO1**	Restate the basics of UV & IR spectroscopy & can interpret its spectrum.	2		1	3		2	2				2
	CO2	Understand the Nuclear Magnetic Resonance	2		1	3		2	2				2
	CO3	Examine the mass spectrometry its use for drug analysis.	2		1	3		2	2				2
	CO4	Get insights of Chromatography& various chromatographic techniques.	2		1	3		2	2				2
	CO5	Illustrate various thermal methods for separation & analysis of drug.	2		1	3		2	2				2
Average (2.00)			**2**		**1**	**3**		**2**	**2**				**2**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPC202T Advanced Organic	**CO1**	To utilize green chemistry concepts and to be the effective substitute for conventional chemistry.	3	2	3	3	-	2	2	-	2	3	3
	CO2	To apply all the catalysis in single & multistep process in manufacturing of drugs and drug intermediates	3	2	3	3	-	2	2	-	2	3	3
	CO3	Stereo-chemical features including conformation and stereo electronic effects; reaction dynamics, and	3	2	2	3	-	2	2	-	2	2	3

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Chemistry II Theory		photochemical reactions											
	CO4	To synthesize novel peptidomimetics using peptide chemistry	3	3	3	3	-	2	2	-	2	2	3
Average (2.48)			**3**	**2.2**	**2.7**	**3**		**2**	**2**		**2**	**2.5**	**3**

Course Code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPC203T Computer Aided Drug Design Theory	**CO1**	To utilize various molecular modelling software in the design of novel drug-like molecules.	3	3	3	3	3	2	2		2	2	3
	CO2	To apply the various softwares for physicochemical property prediction.	3	3	3	3		2	2		2	2	3
	CO3	Role of CADD in drug discovery.	3	2	2	3		2	2		1	1	3
	CO4	The in-silico virtual screening protocols	3	2	2	3		2	2		1	1	3
Average (2.4)			**3**	**2.5**	**2.5**	**3**	**3**	**2**	**2**		**1.5**	**1.5**	**3**

Course code	**Course outcome**		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPC204T Pharmaceutical Process	**CO1**	To develop synthetic routes that is safe, cost-effective, environmentally friendly, and efficient.	3	2	2	3		2	2		2	2	3
	CO2	The pilot plant procedure for the manufacture of Active Pharmaceutical Ingredients and new chemical entities for the drug development phase	3	2	2	2		2	2		2	2	3

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Chemistry Theory	CO3	The various unit operations and various reactions in process chemistry	3	2	2	3		2	2		2	2	3
	CO4	The principles and applications of modern chemical instrumentation, experiment design, and data analysis.	3	2	2	3		2	2		2	2	3
Average (2.07)			**3**	**2**	**2**	**2.7**		**2**	**2**		**2**	**2**	**3**

Course code	**Course outcome** Students will be able to		**CO TO PO Mapping**										
			PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
MPC205P Pharmaceutical Chemistry Practical- II	CO1	Students will acquire knowledge regarding computational tools and be able to apply these for drug design and development	3	2	3	3	3	2	2		2	2	3
	CO2	Students will acquire skills to apply knowledge of Spectroscopic techniques for analysis of pharmaceutical ingredients and intermediates.	3	2	3	3		2	2		2	2	3
	CO3	Conceptual understanding of advanced synthetic protocol will impart students with ability of applying knowledge and skills for commercial purpose.	3	2	2	3		2	2		2	2	3
	CO4	To perform various assignments on regulatory requirements in API	3	2	2	-		2	2		2	2	3
Average (2.45)			**3**	**2**	**2.5**	**3**	**3**	**2**	**2**		**2**	**2**	**3**

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M Pharm SEM I and SEM II-C.B.G.S. (Choice Based Credit & Grading System)
Pharmaceutical Quality Assurance

Course code	Course outcome Students should be able to		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 102T Quality Management System Theory	CO1	Illustrate various aspects of quality and customer focus	3	2	2	2	2	2	3	3	2		3
	CO2	Explain basics of Pharmaceutical Quality Management	3	3	3	3	1	2	2	1			2
	CO3	Describe management of drug stability	3	3	2	2			2		3		3
	CO4	Understand Statistical Process Control	3	3	2	2			2				1
	CO5	Comprehend Regulatory Compliance through Quality Management & Students should be able to explain out of specifications and CAPA	3	3	3	3	2	2	3				2
Average (2.33)			**3**	**2.8**	**2.4**	**2.4**	**1.6**	**2**	**2.4**	**2**	**2.5**		**2.2**

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Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 103T Quality Control and Quality Assurance Theory	CO1	To understand the cGMP aspects of in pharmaceutical industries.	3	2	2	3	2	1	2	3	3	3	3
	CO2	To appreciate the importance of documentation in QA department.	2	1	1	2	3	3	2	3	3	3	2
	CO3	To study the principles and validation of analytical method for estimation of drugs	3	3	2	3	2	3	2	2	2	3	3
	CO4	To understand the scope of quality certification applicable to the pharmaceutical industries.	3	2	2	3	2	3	3	2	2	3	3
	CO5	To understand the responsibilities of QC and QA Departments.	3	2	3	2	2	3	3	3	2	1	3
Average (2.45)			2.8	2	2	2.6	2.2	2.6	2.4	2.6	2.4	2.6	2.8

Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 104T Product development and Technology Transfer Theory	CO1	To understand the new product development process.	3	2	3	3	3	2	2	1	3	2	3
	CO2	To understand the necessary information through the technology transfer from R and D department to manufacturing department.	2	3	3	1	3	3	2	-	3	2	3
	CO3	To study the Principles of Drug discovery and development process.	3	3	3	2	3	3	2	2	2	3	3
	CO4	To understand the technology transfer process in the industries between various manufacturing industries.	2	2	3	3	2	2	2	1	3	2	3
	CO5												
Average (2.41)			2.5	2.5	3	2.2	2.7	2.5	2	1.3	2.7	2.2	3

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Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 105P Pharmaceutics Quality Assurance Practical I	**CO1**	Perform analysis of Pharmacopeial compounds in bulk and in their formulations along with simultaneous estimation of multi-drug component by UV spectrophotometry along with perform experiments based on HPLC, Gas Chromatography	2	3	3	3	2	3	2	1	1	1	3
	CO2	Perform estimation of compounds by fluorimetry, flame photometry or AAS.	3	2	3	3	1	3	3	1	1	1	3
	CO3	Develop of stability study protocol & estimate process capability and perform In process and finished product quality control tests for tablets, capsules, parenteral and semisolid dosage forms.	3	3	3	3	1	3	3	1	1	1	3
	CO4	Carry out pre formulation study for tablets, parenteral & study the effect of pH on the solubility of drugs and to perform Quality control tests for Primary and secondary packaging materials with Accelerated stability studies.	3	3	3	3	1	3	3	1	1	1	3
	CO5	Perform Assay of raw materials as per official monographs & Testing of related and foreign substances in drugs and raw materials	2	3	3	3	2	3	2	1	1	1	3
Average (2.21)			**2.6**	**2.8**	**3**	**3**	**1.4**	**3**	**2.6**	**1**	**1**	**1**	**3**

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Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 201T Hazards and Safety Management Theory	CO1	Understand about environmental problems related to natural resources and ecosystem including environmental hazards	2	2	3	3	2	2	3	3	2	3	3
	CO2	Study air-based hazards and processes for prevention of it	2	2	2	2	2	2	2	2	2	3	3
	CO3	Study chemical-based hazards and control measures for it, management of combustible gases and over exposure to chemicals	2	1	3	3	2	1	2	1	1	3	3
	CO4	Get knowledge about fire and explosion hazards and to implement safety standards and management of fires and explosion	2	1	2	3	1	2	2	2	2	3	3
	CO5	Study the factory acts and rules and processes of risk managements	3	2	3	2	2	2	2	1	3	3	3
Average (2.23)			2.2	1.6	2.6	2.6	1.8	1.8	2.2	1.8	2	3	3

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Course code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 202T Pharmaceutical Validation	CO1	To understand the complexity and the concepts of calibration, qualification and validation.	3	2	2	2	1	2	2	1	2		2
	CO2	To demonstrate deep understanding of the qualification of various equipment and instruments.	3	2	2	2	1		2	1	2	1	1
	CO3	To understand and explain the process validation of different dosage forms.	2	2	1	2	1	2	2	2	1	3	2
	CO4	To understand the importance and implementation of validation of analytical method for estimation of drugs.	3	1	2	1	2	2	1	2	2	1	3
	CO5	To understand the cleaning validation of Equipments employed in the manufacture of pharmaceuticals	2	2	2	1	3	2	2		1	2	3
Average (1.81)			2.4	1.8	1.8	1.6	1.6	2	1.8	1.5	1.6	1.7	2.2

Course Code	Course outcome		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 203T Audits and Regulatory Compliance Theory	CO1	Understand . objectives, management, responsibilities, planning and administration of auditing.	3	3	3	3	3	2	3	2	2	1	3
	CO2	Study auditing processes in pharmaceutical manufacturing environment	3	3	3	3	2	2	3	2	2	1	3
	CO3	Auditing of vendors and production department consisting bulk manufacturing, packaging material, storage and warehousing and dry production	3	3	3	3	2	2	2	2	2	1	2
	CO4	Study the microbiological laboratory auditing	3	3	3	3	2	2	2	2	2	1	2

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		consisting of manufacturing process, Product and process information, building raw materials and Water, Packaging materials.											
	CO5	auditing of quality assurance and engineering department consisting of QA department, critical systems of Q. A.	3	3	3	3	2	2	2	2	2	1	2
Average (2.36)			**3**	**3**	**3**	**3**	**2.2**	**2**	**2.4**	**2**	**2**	**1**	**2.4**

Course Code	Course outcome Student shall be able to understand		CO TO PO Mapping										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 204T Pharmaceutical Manufacturing Technology Theory	CO1	Common practices in pharmaceutical industry lopment	3	2	2	2	2	2	3	3	2		1
	CO2	Practices of aseptic Process technology	3	2	2	2	3	2	3	3		1	2
	CO3	Practices of non-sterile manufacturing technology	3	2	2	2	2	2	2	3	3	1	3
	CO4	Practices of Packaging technology	3	3	2	2	3	2	2	3			1
	CO5	Principles and implementation of Quality by design (Qbd)	3	3	2	1	2	2	2	3	3	1	2
Average (2.36)			**3**	**2.4**	**2**	**1.6**	**2.4**	**2**	**2.4**	**3**	**2.6**	**1**	**1.8**

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Course Code	Course outcome		CO TO PO Mapping									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
MQA 205P Pharmaceutical Quality Assurance Practical-II	CO1	Perform analysis of Organic contaminants residue analysis by HPLC and estimation of Metallic contaminants by Flame photometer, Identification of antibiotic residue by TLC and Estimation of Hydrogen Sulphide in Air as well as Chlorine in Work Environment	2	3	3	3	2	3	2	1	1	1	3
	CO2	Perform Sampling and analysis of SO2 using Colorimetric method, Perform qualification of Autoclave, Hot air oven, Powder Mixer (Dry) Tablet compression Machine, Pharmaceutical Testing Equipment (Dissolution testing apparatus, Friability Apparatus, Disintegration Tester) and two analytical instruments	3	2	3	3	1	3	3	1	1	1	3
	CO3	Perform validation of an analytical method for a drug and processing area and cleaning validation of one equipment	3	3	3	3	1	3	3	1	1	1	3
	CO4	Design of plant layout: Sterile and non-sterile products and do Check list for Bulk Pharmaceutical Chemicals vendors, tableting production, sterile production area, Water for injection.	3	3	3	3	1	3	3	1	1	1	3
	CO5	Explain Case study on application of QbD and PAT	2	3	3	3	2	3	2	1	1	1	3
Average (2.21)			2.6	2.8	3	3	1.4	3	2.6	1	1	1	3

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CRITERIA 2

TEACHING LEARNING AND EVALUATION

2.6 STUDENT PERFORMANCE AND LEARNING OUTCOMES

COURSE OUTCOME ATTAINMENT

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Evaluation of course Outcome Attainment

B. Pharmacy First Year Semester I Theory

Sr. No.	Course code	Course Name	University Attainment		Sessional Attainment		Attainment level		Percent Attainment	Attainment in Scale 3
			100%	75%	100%	25%	Achieved	Required		
1	BP101T	Human Anatomy and Physiology I–	2.12	1.59	2.23	0.56	2.15	2.23	96.41	2.89
2	BP102T	Pharmaceutical Analysis I	1.91	1.43	2.08	0.52	1.95	2.22	87.84	2.64
3	BP103T	Pharmaceutics I	1.7	1.28	2.19	0.55	1.83	1.94	94.33	2.83
4	BP104T	Pharmaceutical Inorganic Chemistry	1.84	1.38	2.09	0.52	1.9	2.15	88.37	2.65
5	BP105T	Communication skills	2.8	2.1	2.22	0.55	2.65	2.32	100.00	3.00

B. Pharmacy First Year Semester I Practical

6	BP107P	Human Anatomy and Physiology	2.88	2.01	2.8	0.7	2.71	2.26	100.00	3.00
7	BP108P	Pharmaceutical Analysis I	2.53	1.77	2.82	0.71	2.48	2.31	100.00	3.00
8	BP109P	Pharmaceutics I	2.69	1.89	2.76	0.69	2.58	2.05	100.00	3.00
9	BP110P	Pharmaceutical Inorganic Chemistry	2.54	1.78	2.76	0.83	2.61	2.5	100.00	3.00
10	BP111P	Communication skills	2.69	1.88	2.75	0.69	2.57	2.42	100.00	3.00

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B. Pharmacy First Year Semester II Theory										
11	BP201T	Human Anatomy and Physiology II	2.13	1.6	2.81	0.7	2.3	2.37	97.05	2.91
12	BP202T	Pharmaceutical Organic Chemistry I	1.57	1.17	2.59	0.65	1.82	2.18	83.49	2.50
13	BP203T	Biochemistry – Theory	1.99	1.49	2.11	0.53	2.02	2.12	95.28	2.86
14	BP204T	Pathophysiology – Theory	1.72	1.29	2.18	0.54	1.83	2.17	84.33	2.53
15	BP205T	Computer Applications in Pharmacy	2.63	1.97	2.42	0.61	2.58	2.32	100.00	3.00
16	BP206T	Environmental sciences – Theory *	2.47	1.85	2.82	0.7	2.55	2.15	100.00	3.00
B. Pharmacy First Year Semester II Practical										
17	BP207P	Human Anatomy and Physiology II	2.66	1.86	2.87	0.86	2.72	2.48	100.00	3.00
18	BP208P	Pharmaceutical Organic Chemistry I	2.66	1.86	2.32	0.69	2.55	2.3	100.00	3.00
19	BP209P	Biochemistry	2.64	1.85	2.75	0.82	2.67	2	100.00	3.00
20	BP210P	Computer Applications in Pharmacy	2.75	1.92	2.87	0.86	2.78	2.4	100.00	3.00

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B. Pharmacy Second Year Semester III Theory										
21	BP301T	Pharmaceutical Organic Chemistry II- Theory	2.13	1.6	3.04	0.76	2.36	2.05	100.00	3.00
22	BP302T	Physical Pharmaceutics I- Theory	1.83	1.37	2.75	0.69	2.06	2.46	83.74	2.51
23	BP303T	Pharmaceutical Microbiology-Theory	1.73	1.3	2.3	0.58	1.88	2.22	84.68	2.54
24	BP304T	Pharmaceutical Engineering-Theory	1.82	1.36	2.53	0.63	1.99	2.25	88.44	2.65
B. Pharmacy Second Year Semester III Practical										
25	BP305P	Pharmaceutical Organic Chemistry II-Practical	2.61	1.83	2.48	0.75	2.58	1.96	100.00	3.00
26	BP306P	Physical Pharmaceutics-Practical	2.82	1.98	2.68	0.8	2.78	2.23	100.00	3.00
27	BP307P	Pharmaceutical Microbiology-Practical	2.92	2.05	2.55	0.77	2.82	2.22	100.00	3.00
28	BP 308P	Pharmaceutical Engineering-Practical	2.74	1.92	2.58	0.77	2.69	2.4	100.00	3.00

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B. Pharmacy Second Year Semester IV Theory										
29	BP401T	Pharmaceutical Organic Chemistry III– Theory	2.13	1.59	2.62	0.66	2.25	2.17	100.00	3.00
30	BP402T	Medicinal Chemistry I – Theory	1.72	1.29	1.97	0.49	1.78	2.37	75.11	2.25
31	BP403T	Physical Pharmaceutics II –Theory	2.04	1.53	2.33	0.58	2.11	2.44	86.48	2.59
32	BP404T	Pharmacology I – Theory	2.1	1.58	2.3	0.58	2.16	1.7	100.00	3.00
33	BP405T	Pharmacognosy I – Theory	2.24	1.68	2.45	0.61	2.29	1.92	100.00	3.00
B. Pharmacy Second Year Semester IV Practical										
34	BP406P	Medicinal Chemistry I – Practical	2.5	1.75	2.95	0.88	2.63	2.37	100.00	3.00
35	BP407P	Physical Pharmaceutics II –Practical	2.57	1.8	2.78	0.83	2.63	2.55	100.00	3.00
36	BP408P	Pharmacology I – Practical	2.71	1.9	2.68	0.8	2.7	1.7	100.00	3.00
37	BP409P	Pharmacognosy I – Practical	2.69	1.88	2.44	0.73	2.61	2.21	100.00	3.00

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B. Pharmacy Third Year Semester V Theory										
38	BP501T	Medicinal Chemistry II – Theory	1.9	1.43	2.26	0.56	1.99	2.37	83.97	2.52
39	BP502T	Industrial Pharmacy I– Theory	1.77	1.33	2.68	0.67	2	2.33	85.84	2.58
40	BP503T	Pharmacology II – Theory	2.04	1.53	2.39	0.6	2.13	1.77	100.00	3.00
41	BP504T	Pharmacognosy and Photochemistry-II – Theory	1.81	1.36	2.4	0.6	1.96	2.07	94.69	2.84
42	BP505T	Pharmaceutical Jurisprudence – Theory	2.09	1.57	2.46	0.62	2.19	2.19	100.00	3.00
B. Pharmacy Third Year Semester V Practical										
43	BP506P	Industrial Pharmacy I– Practical	2.85	0.71	2.85	0.85	1.56	2.11	73.93	2.22
44	BP507P	Pharmacology II – Practical	2.63	0.66	2.63	0.79	1.45	1.87	77.54	2.33
45	BP508P	Pharmacognosy II – Practical	2.73	0.68	2.73	0.82	1.5	2.1	71.43	2.14

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B. Pharmacy Third Year Semester VI Theory										
46	BP601T	Medicinal Chemistry III – Theory	2.32	1.74	2.49	0.62	2.36	2.08	100	3.00
47	BP602T	Pharmacology III – Theory	2.48	1.86	2.72	0.68	2.54	2.2	100	3.00
48	BP603T	Herbal Drug Technology –Theory	1.91	1.43	2.82	0.7	2.13	2.02	100	3.00
49	BP604T	Biopharmaceutics and Pharmacokinetics – Theory	2.31	1.73	2.49	0.62	2.35	2.32	100	3.00
50	BP605T	Pharmaceutical Biotechnology– Theory	2.14	1.6	2.36	0.59	2.19	2.1	100	3.00
51	BP606T	Quality Assurance– Theory	1.8	1.35	2.26	0.57	1.92	2.14	89.72	2.69
B. Pharmacy Third Year Semester VI Practical										
52	BP607P	Medicinal chemistry III –Practical	2.6	1.82	2.76	0.83	2.65	2.27	100	3.00
53	BP608P	Pharmacology III – Practical	2.96	2.07	2.74	0.82	2.89	2.22	100	3.00
54	BP609P	Herbal Drug Technology –Practical	2.93	2.05	2.74	0.82	2.87	2.12	100	3.00

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B. Pharmacy Final Year Semester VII Theory										
55	BP701T	Instrumental Methods of Analysis	1.88	1.41	2.4	0.6	2.01	2.08	96.63	2.90
56	BP702T	Industrial Pharmacy II – Theory	2.2	1.65	2.52	0.63	2.28	2.21	100	3.00
57	BP703T	Pharmacy Practice – Theory	2.1	1.58	2.43	0.61	2.19	2.37	92.41	2.77
58	BP704T	Novel Drug Delivery System – Theory	2.12	1.59	2.75	0.69	2.28	2.07	100	3.00
B. Pharmacy Final Year Semester VII Practical										
59	BP705P	Instrumental Methods of Analysis Practical	2.59	1.81	2.41	0.6	2.41	2.55	94.51	2.84

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B. Pharmacy Final Year Semester VIII Theory										
60	BP801T	Biostatistics and Research Methodology – Theory	1.91	1.43	3.1	0.77	2.2	2.1	100	3.00
61	BP802T	Social and Preventive Pharmacy – Theory	2.41	1.81	2.81	0.7	2.51	2.1	100	3.00
62	BP805ET	Pharmacovigilance – Theory	2.33	1.75	3.6	0.9	2.65	2.08	100	3.00
63	BP811ET	Advanced Instrumentation Techniques – Theory	2.36	1.77	3.48	0.87	2.64	2.28	100	3.00

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Indirect Program outcome					
Sr. No.	Program outcome	Required PO Attainment Scale 3	Required PO Attainment in percentage	Obtained PO Attainment Scale 3	Obtained PO Attainment in percent
1	PO 1	3	100	2.36	78.67
2	PO 2	3	100	2.46	82.00
3	PO 3	3	100	2.57	85.67
4	PO 4	3	100	2.14	71.33
5	PO 5	3	100	2.33	77.67
6	PO 6	3	100	2.58	86.00
7	PO 7	3	100	2.42	80.67
8	PO 8	3	100	2.47	82.33
9	PO 9	3	100	2.46	82.00
10	PO 10	3	100	2.61	87.00
11	PO 11	3	100	2.48	82.67

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Institute Program Outcome (POs) Attainment

Direct (80%) + Indirect (20%)

Average Direct PO attainment	Average Indirect PO attainment	Total PO Attainment	Total PO percent attainment
1.9	0.49	2.39	**79.67 %**

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