



R. L. TAWDE FOUNDATION'S
SAROJINI COLLEGE OF PHARMACY

R. S. No. 576, Near Rajendranagar Water Tank, Rajendranagar, Kolhapur. - 416004
E - mail - sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com

INSTITUTIONAL
COURSE OUTCOME,
CO-PO MAPPING
AND
KOLHAPUR
JUSTIFICATION



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INDEX

Sr. No.	Content	Page No
1	Vision and Mission of Institute	3
2	Statement of PEO's	3
3	Statement of PO's	4
4	Bloom Taxonomy	6
5	Statement of Course Outcome, CO-PO Mapping with Justification	7

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Our Vision

To be recognized among the best institutes in India for excellence in Pharmacy education.

Our Mission

To impart value based Pharmacy Education and nurture research activities by inculcating personal touch and mutual respect amongst the stakeholders.

Program Educational Objectives

1. To achieve excellence in academic, administrative and personality development fronts through our teaching learning process.
2. To achieve a status of premier pharmacy institute.
3. To develop research and development and consultancy cell.
4. To strengthen industry-institute interaction to provide industrial exposure to the students and up-gradation of faculty knowledge about advance trends.



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PROGRAM OUTCOMES (POs)

1. **Pharmacy Knowledge:** An ability to acquire, demonstrate, core and basic knowledge of Pharmaceutical and Life Sciences.
2. **Planning Abilities:** An ability to develop, implement, effectively plan and organize work using time management, resource management, delegation skills and organizational skills to achieve goals in specified timeline.
3. **Problem Analysis:** An ability to identify, analyze, interpret data and take appropriate decision to solve problems related to routine Pharmacy Practices by applying acquired knowledge.
4. **Modern Tool Usage:** An ability to understand, choose and utilize Modern techniques and computing tools for Pharmacy practices by considering constraints.
5. **Leadership Skills:** An understanding of pharmaceutical management principles and apply these to one's own work, as a member and leader in a team, to manage projects to facilitate improvement in social health and well-being.
6. **Professional Identity:** Ability to recognize, analyze and communicate Pharmacy professional values as a healthcare promoter.
7. **Pharmaceutical Ethics:** Ability to understand and use professional, ethical, legal, social issues and responsibilities for well-being of the society.
8. **Communication:** An ability to comprehend, write reports, present and document to communicate effectively for exchange of professional information to Pharmacy community and society.
9. **The Pharmacist and Society:** An ability to overcome the societal, health and legal problems by providing better pharmaceutical care relevant to the Pharmacy profession.
10. **Environment and Sustainability:** An ability to recognize the impact of the professional Pharmaceutical solutions in social and environmental circumstances for sustainable development.
11. **Life-Long Learning:** An ability to recognize the need to engage in continuous Professional development by taking in consideration timely feedback and technological changes for lifelong learning process.



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THE POs ARE PUBLISHED AND DISSEMINATED

The Program Outcomes are published and disseminated as follows

HOW TO PUBLISHED	WHERE TO PUBLISHED	HOW DISSEMINATED
Incorporated in presentation given in Orientation, Course files, Academic Book	Academic Book, Course Files, Laboratories in the Departments	Discussed during Orientation Discussed during student Counseling Distributed in Course file, Practical work book
Flex	Class Rooms/Laboratories Department, Notice Boards,	Self-reading by Students, Parents and Alumni
Digital Media	Institute Website: www.sarojinicollegeofpharmacy.com	Available for Self-reading in public domain

BLOOM'S TAXONOMY

Bloom's Taxonomy was created by Benjamin Bloom in 1956, published as a kind of classification of learning outcomes and objectives that have, in the more than half-century since, been used for everything from framing digital tasks and evaluating apps to writing questions and assessments.

The original sequence of cognitive skills was Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. The framework was revised in 2001 by Lorin Anderson and David Krathwohl, yielding the revised Bloom's Taxonomy. The most significant change was the removal of 'Synthesis' and the addition of 'Creation' as the highest-level of Bloom's Taxonomy. And being at the highest level, the implication is that it's the most complex or demanding cognitive skill—or at least represents a kind of pinnacle for cognitive tasks.

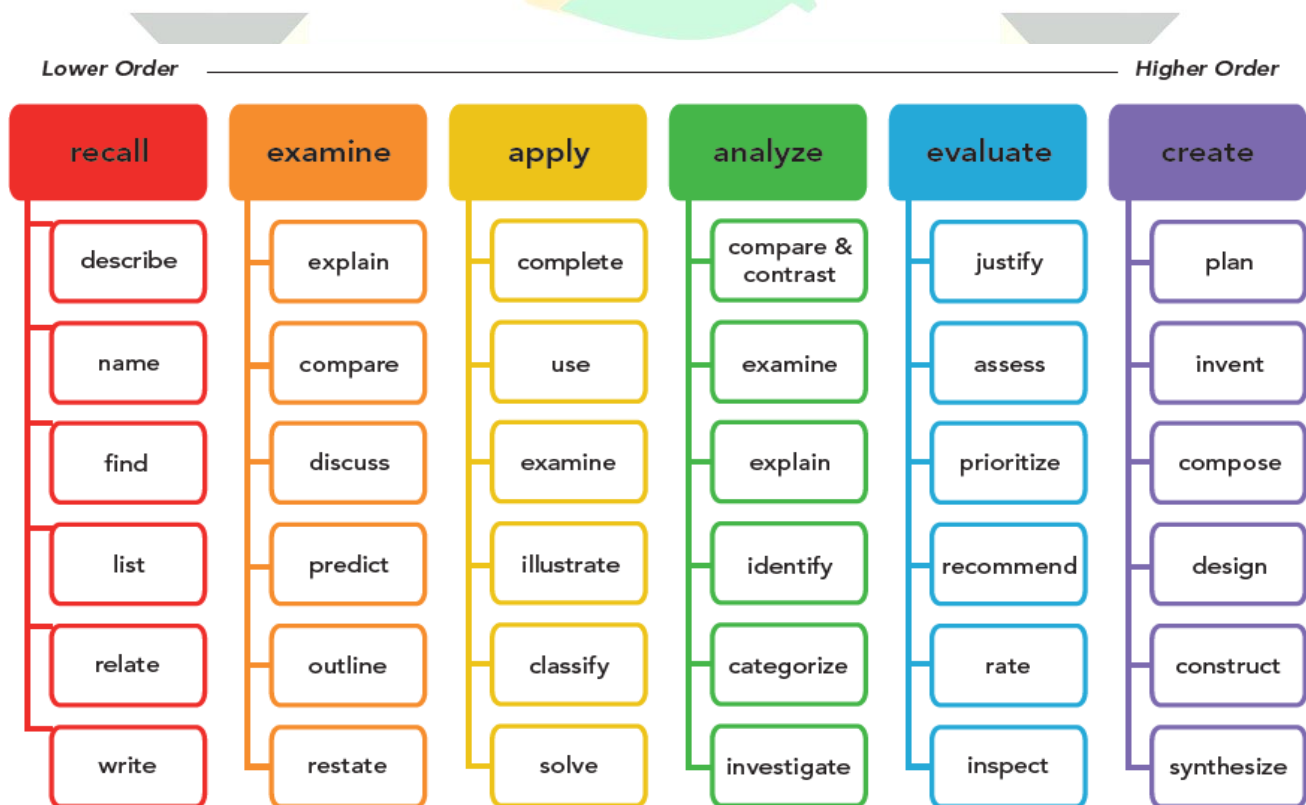


Fig. No. 1 Bloom's Taxonomy



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STATEMENT OF
COURSE OUTCOME,
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LIST OF COURSE

Subject Code	Course Name	Page No.
	Course Study for Semester I	
BP 101 T	Human Anatomy and Physiology I- Theory	11
BP 107 P	Human Anatomy and Physiology I- Practical	13
BP 102 T	Pharmaceutical Analysis I - Theory	15
BP 108 P	Pharmaceutical Analysis I - Practical	17
BP 103 T	Pharmaceutics I - Theory	19
BP 109 P	Pharmaceutics I - Practical	21
BP 104 T	Pharmaceutical Inorganic Chemistry - Theory	23
BP 110 P	Pharmaceutical Inorganic Chemistry - Practical	25
BP 105 T	Communication skills - Theory	27
BP 111 P	Communication skills - Practical	29
	Course Study for Semester II	
BP 201 T	Human Anatomy and Physiology II- Theory	32
BP 207 P	Human Anatomy and Physiology II- Practical	34
BP 202 T	Pharmaceutical Organic Chemistry I - Theory	36
BP 208 P	Pharmaceutical Organic Chemistry I - Practical	38
BP 203 T	Biochemistry - Theory	40
BP 209 P	Biochemistry - Practical	42
BP 204 T	Pathophysiology - Theory	44
BP 205 T	Computer Applications in Pharmacy - Theory	46
BP 210 P	Computer Applications in Pharmacy - Practical	48
	Course Study for Semester III	
BP 301 T	Pharmaceutical Organic Chemistry II - Theory	51
BP 305 P	Pharmaceutical Organic Chemistry II- Practical	53
BP 302 T	Physical Pharmaceutics I - Theory	55
BP 306 P	Physical Pharmaceutics I - Practical	57
BP 303 T	Pharmaceutical Microbiology - Theory	59
BP 307 P	Pharmaceutical Microbiology - Practical	61
BP 304 T	Pharmaceutical Engineering - Theory	63
BP 308 P	Pharmaceutical Engineering - Practical	65
	Course Study for Semester IV	
BP 401 T	Pharmaceutical Organic Chemistry III - Theory	68
BP 402 T	Medicinal Chemistry I - Theory	70
BP 406 P	Medicinal Chemistry I - Practical	72
BP 403 T	Physical Pharmaceutics I - Theory	74
BP 407 P	Physical Pharmaceutics I - Practical	76
BP 404 T	Pharmacology I - Theory	78
BP 408 P	Pharmacology I - Practical	80
BP 405 T	Pharmacognosy and Phytochemistry I- Theory	82
BP 409 P	Pharmacognosy and Phytochemistry I- Practical	84
	Course Study for Semester V	
BP 501 T	Medicinal Chemistry II - Theory	87
BP 502 T	Industrial PharmacyI- Theory	89
BP 506 P	Industrial PharmacyI- Practical	91
BP 503 T	Pharmacology II - Theory	93
BP 507 P	Pharmacology II - Practical	95



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Subject Code	Name of the Subject	Page No.
BP 504 T	Pharmacognosy and Phytochemistry II- Theory	97
BP 508 P	Pharmacognosy and Phytochemistry II- Practical	99
BP 505 T	Pharmaceutical Jurisprudence - Theory	101
	Course Study for Semester VI	
BP 601 T	Medicinal Chemistry III - Theory	104
BP 607 P	Medicinal Chemistry III - Practical	106
BP 602 T	Pharmacology III - Theory	108
BP 608 P	Pharmacology III - Practical	110
BP 603 T	Herbal Drug Technology - Practical	112
BP 609 P	Herbal Drug Technology - Theory	114
BP 604 T	Biopharmaceutics and Pharmacokinetics - Theory	116
BP 605 T	Pharmaceutical Biotechnology - Theory	118
BP 606 T	Quality Assurance -Theory	120
	Course Study for Semester VII	
BP 701 T	Instrumental Methods of Analysis - Theory	123
BP 705 P	Instrumental Methods of Analysis - Practical	125
BP 702 T	Industrial Pharmacy II- Theory	127
BP 703 T	Pharmacy Practice - Theory	129
BP 704 T	Novel Drug Delivery System - Theory	131
	Course Study for Semester VIII	
BP 801 T	Biostatistics and Research Methodology	134
BP 802 T	Social and Preventive Pharmacy	136
BP 804 ET	Pharmaceutical Regulatory Science	138
BP 805 ET	Pharmacovigilance	140

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Human Anatomy and Physiology-I [(Theory) (BP101T)]

After completion of this course student will be able to:

BP101T.1	Utilize appropriate medical terminology and normal physiological values related to the structure and function of the human body systems
BP101T.2	Describe the structural characteristics and functional processes common to all human cells and tissues.
BP101T.3	Integrate understanding of basic chemical concepts and principles into understanding the human anatomy and physiology.
BP101T.4	Describe the interrelationships of cells, tissues, and body organ systems, homeostasis and the complementarity of structure and functions.
BP101T.5	Demonstrate an understanding of the location, structure and functioning of the major body systems studied.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP101T.1	2	1	1	-	1	1	1	2	1	1	2
BP101T.2	2	1	1	2	1	1	1	2	1	1	2
BP101T.3	2	1	1	-	1	1	1	2	1	1	2
BP101T.4	2	1	1	2	1	1	1	2	1	1	2
BP101T.5	2	1	1	2	1	1	1	2	2	1	2
BP101T	2	1	1	1	1	1	1	2	1	1	2



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Justification for Anatomy and Physiology-I [(Theory) (BP101T)]

PO1	The curriculum encompasses the concepts of normal structure and function of the human body and provides an insight to the implications of disruption of normal structure and function.
PO2	Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
PO3	Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyse, evaluate and apply information systematically and shall make defensible decisions.
PO4	Students will learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
PO5	Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.
PO6	Students will understand, analyse and communicate the value of their professional roles in society as health care professionals, promoters of health.
PO7	Honour personal values and apply ethical principles in professional and social contexts.
PO8	The curriculum helps to understand the other pharmacy subject namely pathophysiology, pharmacology and Pharmacotherapeutics. Which are playing important role to communicate effectively with society, hence all CO's are mapping.
PO9	There is application of knowledge will be acquired to access societal and promotion of health, hence the CO's are mapping.
PO10	Students will understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	The pharmacist shall keep himself/herself updated which required lifelong learning, hence the CO's are mapped moderately.

Name & Signature of Staff

Head of Department

Principal



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Human Anatomy and Physiology – I [(Practical) (BP107P)]

After completion of this course student will be able to:

BP107P.1	Recognize and describe different types of tissues and bones.
BP107P.2	Perform haematological experiments
BP107P.3	Record human heart rate, pulse rate, blood pressure and respiratory volumes.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP107P.1	1	1	2	1	1	1	2	1	2	2	2
BP107P.2	1	1	2	1	1	1	2	1	2	2	2
BP107P.3	1	1	2	1	1	1	2	1	2	2	2
BP107P	1	1	2	1	1	1	2	1	2	2	2



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Justification for Human Anatomy and Physiology I (Practical) (BP107P)

PO1	The student acquires knowledge on various practical aspects, therefore all CO's mapped low with PO's.
PO2	Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
PO3	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.
PO4	Students will learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
PO5	Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.
PO6	Understand, analyze and communicate the value of their professional roles in society as health care professionals, promoters of health.
PO7	Apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
PO8	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	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	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	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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Pharmaceutical Analysis-I [(Theory) (BP102T)]

After completion of this course, student will be able to:-

BP101T.1	Recognize fundamentals of pharmaceutical analysis and pharmacopeia.
BP101T.2	Explain basic concepts involved in errors, the sources of impurities and methods to determine the impurities.
BP101T.3	Explain the need and basic principles of acid-base titration, non-aqueous titration, complexometric titration, precipitation titration, gravimetric analysis, etc.
BP101T.4	Illustrate principles, types of electrodes, instrumentation and applications of potentiometry, conductometry and polarography.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP102T.1	3	3	3	3	-	1	-	-	1	-	2
BP102T.2	3	2	3	3	-	-	1	-	1	2	2
BP102T.3	2	2	3	3	2	1	1	1	1	-	2
BP102T.4	2	2	3	3	2	1	-	1	1	2	2
BP102T	3	2	3	3	2	1	1	1	1	2	2



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Justification for Pharmaceutical Analysis-I [(Theory) (BP102T)]

PO1	Pharmaceutical Analysis consists of the basic knowledge of the pharmacy field & also about analytical methods of quality control followed in the pharmaceutical industry. So the student will gain basic knowledge about the pharmacy profession as well as pharmaceutical sciences. Hence CO1 & CO2 are mapped high and CO3 & CO4 are mapped moderate.
PO2	The course demonstrate effective planning abilities including time management, resource management, delegation skills, and organizational skills. While doing any analytical work, planning is very important to avoid errors & to get more accurate results. So CO1 is mapped high and CO2, CO3, CO4 are mapped moderate.
PO3	The volumetric & electrochemical analysis will surely develop the problem-solving attitude of the students because analytical thinking & applying scientific knowledge are the major tools for any pharmaceutical analysis. Hence, all COs are mapped high.
PO4	Modern pharmacy-related computing tools are majority in-use, in case of potentiometry, conductometry and polarography. Hence, all COs are mapped high.
PO5	Understanding and considering leadership and team-building when planning all types of titrations, gravimetric analysis as well as potentiometry, conductometry and polarography is important in analytical practices. Hence CO1 & CO2 are mapped low and CO3 & CO4 are mapped moderately.
PO6	Pharmaceutical Analysis will indirectly give an idea about professional identity & communicate their roles in society through quality control testing. So, CO1, CO3 & CO4 are mapped low.
PO7	Honouring personal values and apply ethical principles in professional contexts is important in the course and study work. It also applies ethical principles while making decisions and take responsibility for the outcomes associated with the decisions up to minimal account. Hence, CO2 & CO3 are mapped low.
PO8	Communicate with the pharmacy community and with society, not effectively with pharmaceutical analysis but effective reports, effective presentations, and documentation are made on the basis of analysis. Hence, CO3 & CO4 are mapped low.
PO9	The results from the analysis will make an impact on social & professional health indirectly, but not covers legal issues and the consequent responsibilities relevant to the professional pharmacy practice. So, all COs are mapped low.
PO10	Understanding the impact of professional pharmacy in environmental contexts is a great concern in analytical studies. The impurity sources & analysis of soil, water & air may contribute to the environmental contexts. So CO2 & CO4 are mapped moderately.
PO11	The course engages the students in lifelong learning, applying new methodologies of analysis & encourages them to find solutions to problems. So, all COs are mapped moderate.

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Pharmaceutical Analysis-I [(Practical) (BP108P)]

After completion of this course, student will be able to:-

BP101T.1	Get acquainted to basic apparatus and instruments along with their calibration procedures.
BP101T.2	Carryout limit tests and various volumetric & electrochemical titrations.
BP101T.3	Develop analytical skills in titrimetric & gravimetric analysis.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP102T.1	3	1	-	-	2	-	1	2	-	2	2
BP102T.2	3	3	2	2	2	2	1	2	2	2	2
BP102T.3	3	3	2	2	2	2	1	2	2	-	2
BP102T	3	3	2	2	2	2	1	2	2	2	2

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Justification for Pharmaceutical Analysis-I [(Practical) (BP108P)]

PO1	The knowledge of glassware and equipment along with its calibration procedure serves as basis in Pharmaceutical Analysis. Volumetric and electrochemical titrations performed in the practical make the students aware about Q.C. testing carried out in the manufacturing industry. Hence, all COs are mapped high.
PO2	Analysing pharmaceuticals demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Hence CO1 is mapped at low level and CO2 & CO3 are mapped high.
PO3	The volumetric & electrochemical analysis will develop the problem solving attitude amongst the students because analytical thinking & application of pharmacy knowledge are the major tools for any process involved in the course. So, CO2, & CO3 are mapped high.
PO4	Electrochemical analysis employs modern instrumental equipment and tools. Hence, CO2 & CO3 are mapped as average/ moderate & CO1 is mapped low.
PO5	Leadership skills required in planning of titration methods and analytical instrument handling. Hence, all COs are mapped moderate.
PO6	Analysis of pharmaceuticals and drug testing methods help to protect the health of society & thereby establish a strong professional identity. Hence, CO2 & CO3 are mapped moderately.
PO7	Ethical issues are concerned with analytical data handling to a certain extent. Hence, all COs are mapped low.
PO8	Communicate with the pharmacy community and with society, not effectively with pharmaceutical analysis but effective reports, effective presentations, and documentation are made on the basis of analysis. Hence, all COs are mapped moderate.
PO9	The output of analytical processes and detecting limit tests will indirectly have a dealing impact on social & professional health. So, CO2 and CO3 are mapped moderately.
PO10	Analytical data on sources of impurities & electrochemical assay of water may contribute to concern of environmental safety. Hence, CO2 is mapped moderately.
PO11	The course engages students to participate in modern analytical tool usage and encourage to upgrade to instrumental techniques. Lifelong learning of the course also encourage students to develop professional being. Hence, CO2 & CO3 are mapped moderately.

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Pharmaceutics-I [(Theory) (BP103T)]

After completion of this course student will be able to:

BP101T.1	Explain pharmacy history, pharmacopoeias, dosage forms, prescription handling and posology.
BP101T.2	Present doses, domestic conversions, pharmaceutical calculations, dosage calculations
BP101T.3	Demonstrate the professional way of handling the prescription
BP101T.4	Demonstrate formulation of different pharmaceutical dosage forms

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP101T.1	3	3	2	1	1	2	2	2	2	-	1
BP101T.2	3	1	3	2	1	1	2	2	2	-	3
BP101T.3	2	3	1	2	1	3	2	3	3	-	1
BP101T.4	2	2	1	2	1	2	1	1	2	1	3
BP101T	3	2	2	2	1	2	2	2	2	-	3



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Justification for Pharmaceutics-I [(Theory) (BP103T)]

PO1	All CO's are mapped high, as the information here is basic for the student to gain elementary pharmacy knowledge.
PO2	CO's are mapped moderate as students would be able to plan and demonstrate the properties of ingredients and other constituents in development of a proper dosage form.
PO3	Students will be able to think from critical analysis point of view and solve complex problems. Hence, CO1 and CO2 are mapped moderate.
PO4	Methods generated for students to know and understand evaluation and testing of different dosage forms. Hence, mapped moderately.
PO5	Students will understand co-working and co-operation, which in turn will help them understand team building. Hence, CO2 and CO3 are mapped Moderate.
PO6	The theoretical aspects and practical work done will be creating a professional mind set in the students and take their work responsibly. Hence, moderate mapping is observed here.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, CO1, CO2 are mapped moderate.
PO8	Students will develop good communication skills will be able to write effectively reports and make presentations. Hence, all CO's are mapped moderate.
PO9	No societal and social considerations and other obligations come across the students' career. Hence, moderate mapping.
PO10	No curriculum content is related to the environment and sustainability. Hence, Moderate mapping
PO11	Lifelong learning is a feature of professional pharmacist. Hence, all CO's are mapped High.

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Pharmaceutics-I [(Practical) (BP109P)]

After completion of this course student will be able to:

BP109P.1	Explain formulation, evaluation and labelling of aromatic water, glycerides, syrups, elixirs and powder preparations.
BP109P.2	Plan use of ingredients in formulation and category of formulation.
BP109P.3	Prepare various monophasic preparations depending upon their formulation.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP109P.1	2	2	2	3	2	-	2	2	-	-	2
BP109P.2	2	2	2	3	2	-	2	2	-	-	2
BP109P.3	2	2	2	3	2	-	2	2	-	-	2
BP109P	2	2	2	3	2	-	2	2	-	-	2

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R. S. No. 576, Near Rajendranagar Water Tank, Rajendranagar, Kolhapur. – 416004
E - mail – sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com

Justification for Pharmaceutics-I [(Practical) (BP109P)]

PO1	Students learn the concepts of pharmaceutical formulation and evaluation of physicochemical properties of dosage forms. Hence, all COs are mapped Moderate.
PO2	Students develop effective planning skills to demonstrate process of making a formulation. Hence, all COs are mapped Moderate.
PO3	Students will be able to think critically and analytically, also solving complex calculations to measure the right amount of dose by using mathematical tools. Hence, all COs are mapped Moderate.
PO4	Students gain knowledge about the modern analytical tools for evaluation of certain properties of drug and dosage forms and will decide about the quality built in the dosage form. Hence, all COs mapped moderately.
PO5	Students will work in groups and teams and further coordinate among team members to formulate formulation and then evaluate them. Therefore, the entire COs mapped Moderate.
PO6	The curriculum is not related to analyzing and communicating the value of the roles in the society. Hence, there is no mapping.
PO7	Students are able to apply ethical principles in professional and social contexts. Hence, all COs are mapped Moderate.
PO8	Students will good communication skills will be able to write, design and present formulation and evaluation reports effectively. Hence, all COs are mapped Moderate.
PO9	No curriculum content is related to the social and legal issues of professional pharmacy practice. Hence, there is no mapping.
PO10	No curriculum content is related to the environment and sustainability. Hence there is no mapping
PO11	Students will update themselves with newer information, which requires lifelong learning. Hence all COs are mapped moderately.

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Pharmaceutical Inorganic Chemistry [(Theory) (BP104T)]

After completion of this course student will be able to:

BP104T.1	Comment on various sources of impurities and methods to determine impurities in pharmaceutical substances.
BP104T.2	Explain the basic concepts of acidity/basicity, buffers and tonicity applicable in pharmaceuticals.
BP104T.3	Elaborate different major extra and intra cellular electrolytes with physiological importance of different cations and anions.
BP104T.4	Describe the pharmaceutical significance of different inorganic compounds with their methods of Preparation, chemical reactions and assays.
BP104T.5	Explain the concepts and principles of radiopharmaceuticals.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP104T.1	3	2	2	1	1	-	1	-	-	1	2
BP104T.2	3	1	-	1	1	-	1	-	-	-	2
BP104T.3	3	-	-	1	1	1	1	-	-	-	2
BP104T.4	3	-	1	1	1	2	2	2	1	1	2
BP104T.5	2	-	2	1	1	2	2	2	1	2	2



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Justification for Pharmaceutical Inorganic Chemistry [(Theory) (BP104T)]

PO1	The course involves the study and significance of inorganic compounds to treat various disorders also to study their preparations. All the objectives are directly associated with the pharmacy knowledge, hence all the CO1-CO4 are mapped at high and CO5 moderately.
PO2	To perform the limit tests and analyze the impurities, also to prepare pharmaceutical buffers requires planning at certain extent. Hence CO1 is mapped moderately and CO2 at low level.
PO3	Students should be able to analyse the impurities in pharmaceutical compounds and carry out certain assays to evaluate it. Hence CO1 is mapped moderately and CO3, CO4 are mapped at low level.
PO4	Analyzing impurities, performing limit tests, study the importance of inorganic compounds, certain electrolytes required in the body fluids also radiopharmaceuticals implies the use of modern tools. All COs are mapped low.
PO5	The course emphasises on leadership skills w.r.t. practical aspects to a certain extent. Hence, all COs are mapped low.
PO6	Knowledge of inorganic compounds used as medicines also the study of radiopharmaceuticals to treat, diagnose the disease would help the students to identify themselves as educators and promoters of health in the society. Hence the CO3 is mapped low while CO4 and CO5 are mapped moderately.
PO7	All the objectives of this course involves the study, preparations, analysis, assays and uses of medicinal substances containing inorganic compounds which involves ethical issues. Hence all the Cos are mapped at low.
PO8	Students can acquire skills to communicate, understand and explore the knowledge gained about various pharmaceutical inorganic compounds and radiopharmaceuticals to pharmacy community at certain extent. Hence CO4 and CO5 are mapped at moderate.
PO9	Knowledge of use of various inorganic compounds as medicines and use of radiopharmaceuticals to diagnose and treat the disease ensures better healthcare to the society. Hence CO4 and CO5 are mapped at low.
PO10	Analyzing the impurities of pharmaceutical compounds and performing purity test also the study of inorganic compounds as medicine and use of radiopharmaceuticals have certain effect on environment. Hence CO1 and CO4 are mapped at low and CO5 moderately.
PO11	As inorganic chemistry involves the basic knowledge of pharmacy, course need continue upgradation of knowledge. Hence all the COs are mapped moderately.

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Pharmaceutical Inorganic Chemistry [(Practical) (BP110P)]

After completion of this course student will be able to:

BP108P.1	Develop skills to perform limit test for given sample with precision.
BP108P.2	Identify inorganic salts through various qualitative tests and perform tests for purity for different compounds as per IP.
BP108P.3	Prepare different inorganic salts like boric acid, potash alum and FeSO ₄ .

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP108P.1	2	3	2	1	2	-	1	-	1	1	2
BP108P.2	2	3	2	1	2	2	1	2	1	1	2
BP108P.3	2	3	-	1	2	2	1	2	1	1	2
BP108P	2	3	2	1	2	2	1	2	1	1	2

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Justification for Pharmaceutical Inorganic Chemistry [(Practical) (BP108P)]

PO1	The course involves the study and significance of inorganic compounds to treat various disorders and also to study their preparations. All the objectives are directly associated with the pharmacy knowledge, hence all the COs are mapped moderately.
PO2	To perform the limit tests and analyse the impurities, also to prepare and identify the inorganic compounds requires planning. Hence all COs are mapped high.
PO3	Students should be able to analyse the impurities in pharmaceutical compounds and carry out certain assays to evaluate it. Also need to perform certain tests to identify and test the purity of the inorganic compounds. Hence CO1 and CO2 are mapped moderately.
PO4	Simple instruments are used as modern tool usage in this course. Hence, all COs are mapped low.
PO5	The outcomes require leadership skills to analyse impurities, perform limit test, identify compounds and prepare the inorganic compounds. Hence, all COs are mapped moderately.
PO6	Knowledge of inorganic compounds used as medicines also to prepare, identify and test their purity would help the students to identify themselves as educators and promoters of health in the society. Hence CO2 and CO3 are mapped moderately.
PO7	All the objectives of this course involves the study, preparations, analysis, assays and uses of medicinal substances containing inorganic compounds which involves ethical issues. Hence all the COs are mapped at low level.
PO8	Students can acquire skills to communicate, understand, and explore the knowledge gained about various pharmaceutical inorganic compounds to pharmacy community at certain extent. Hence CO2 and CO3 are mapped at moderate.
PO9	Knowledge of use of various inorganic compounds as medicines, its preparations, analysis, assays and identification ensures better healthcare to the society. Hence all COs are mapped at low.
PO10	Analyzing the impurities of pharmaceutical compounds and performing purity test have certain effect on environment. Hence all COs are mapped at low level.
PO11	As inorganic chemistry involves the basic knowledge of pharmacy, course need continue upgradation of knowledge. Hence all the COs are mapped moderately.

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Communication Skills (Theory) (BP105T)

After completion of this course student will be able to:

BP105T.1	Explain the need of communication skills and barriers to communicate effectively.
BP105T.2	Demonstrate perspectives of communication required to function effectively in areas of pharmaceutical operation.
BP105T.3	Apply various elements & styles of communications, basic listening skills, writing skills to communicate effectively and manage as a team player.
BP105T.4	Apply interview skills, presentation skills and group discussion for development of leadership qualities and essentials.
BP105T.5	Apply basic communication skills and advance learning skills.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP105T.1	-	3	2	-	-	-	-	3	-	-	3
BP105T.2	-	3	2	-	-	-	-	3	-	-	3
BP105T.3	-	3	2	-	-	-	2	3	-	-	3
BP105T.4	-	3	2	-	3	2	2	3	-	-	3
BP105T.5	-	3	2	-	-	2	2	3	-	-	3
BP105T	-	3	2	-	3	2	2	3	-	-	3



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Justification for Communication skills [(Theory) (BP105T)]

PO1	No any CO is mapped since it is not directly linked to pharmacy knowledge.
PO2	All COs are mapped high as all the objectives are directly associated with the thinking and planning abilities.
PO3	All COs are mapped moderate as all the objectives will help to develop problem solving skills.
PO4	No any CO is mapped since there is no direct link with communication skills.
PO5	Presentation skills and group discussions would enable students to develop the team building & leadership quality. Hence, CO2, CO3, CO4 & CO5 are mapped high.
PO6	CO4 & CO5 are mapped moderate as communication skills is an important aspect of professional identity.
PO7	CO3, CO4 & CO5 are mapped low as all these objectives are directly associated with professional ethics.
PO8	All COs are mapped high as all the objectives are directly associated with the communication skills.
PO9	No any CO is mapped since it is not directly related to communication skills.
PO10	No any CO is mapped since it is not directly related to communication skills.
PO11	All COs are mapped high as all the objectives are directly associated with the lifelong learning.

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Communication Skills [(Practical) (BP111P)]

After completion of this course student will be able to:

BP111P.1	Communicate in oral and written communication.
BP111P.2	Enhance Vocabulary, language, grammar and fluency.
BP111P.3	Develop the skills in preparing job search artefacts and negotiating their use in GDs and interviews.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP111P.1	-	3	2	-	-	3	-	3	-	-	3
BP111P.2	-	3	2	-	-	3	-	3	-	-	3
BP111P.3	-	3	2	-	3	3	2	3	-	-	3

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Justification for Communication skills [(Practical) (BP111P)]

PO1	No any CO is mapped since there is no direct link with communication skills.
PO2	All COs are mapped high as all the objectives are directly associated with the thinking and planning abilities.
PO3	All COs are mapped moderate as all the objectives will help to develop problem solving skills.
PO4	No any CO is mapped since there is no direct link with communication skills.
PO5	Presentation skills and group discussions would enable students to develop the leadership quality. Hence CO3 is mapped high.
PO6	All COs are mapped high as communication skills is an important aspect of professional identity.
PO7	CO3 is mapped moderate as all these objectives are directly associated with ethics and professional development.
PO8	All COs are mapped high as all the objectives are directly associated with the communication skills.
PO9	No any CO is mapped since there is no direct link with communication skills.
PO10	No any CO is mapped since there is no direct link with communication skills.
PO11	All COs are mapped high as all the objectives are directly associated with the lifelong learning.

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Human Anatomy and Physiology – II [(Theory) (BP201T)]

After completion of this course student will be able to:

BP201T.1	Utilize appropriate medical terminology and normal physiological values related to the structure and function of the human body systems
BP202T.2	Describe the structural characteristics and functional processes common to all human cells and tissues.
BP203T.3	Integrate understanding of basic chemical concepts and principles into understanding the human anatomy and physiology.
BP204T.4	Describe the interrelationships of cells, tissues, and body organ systems, homeostasis and the complementarity of structure and functions.
BP205T.5	Demonstrate an understanding of the location, structure and functioning of the major body systems studied.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP201T.1	1	1	2	1	1	1	1	1	1	1	2
BP202T.2	1	1	2	2	1	1	1	1	1	1	2
BP203T.3	1	1	2	2	1	1	1	1	1	1	2
BP204T.4	1	1	2	2	1	1	1	1	1	1	2
BP205T.5	1	1	2	2	1	1	1	1	1	1	2
BP201 T	1	1	2	2	1	1	1	1	1	1	2



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Justification for Human Anatomy and Physiology – II (Theory) (BP201T)

PO1	The curriculum encompasses the concepts of normal structure and function of the human body and provides an insight to the implications of disruption of normal structure and function. Hence, all CO's are mapped low.
PO2	Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
PO3	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.
PO4	Students will learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
PO5	Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.
PO6	Students will understand, analyse and communicate the value of their professional roles in society as health care professionals, promoters of health.
PO7	Honor personal values and apply ethical principles in professional and social contexts.
PO8	The curriculum helps to understand the other pharmacy subject namely pathophysiology, pharmacology and Pharmacotherapeutics. Which are playing important role to communicate effectively with society, hence all CO's are mapping.
PO9	There is application of knowledge will be acquired to access societal and promotion of health, hence the CO's are mapping.
PO10	Students will understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	The pharmacist shall keep himself/herself updated which required lifelong learning, hence the CO's are mapped moderately.

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Human Anatomy and Physiology – II [(Practical) (BP207P)]

After completion of this course student will be able to:

BP207P.1	Recognize and describe different types of organ system models, charts and specimen.
BP207P.2	Demonstrate and examinations related to organ systems.
BP207P.3	Record body temperature, basal mass index.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP207P.1	1	1	2	1	1	1	2	1	2	2	2
BP207P.2	1	1	2	1	1	1	2	1	2	2	2
BP207P.3	1	1	2	1	1	1	2	1	2	2	2
BP207P	1	1	2	1	1	1	2	1	2	2	2



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Justification for Human Anatomy and Physiology II (Practical) (BP207P)

PO1	The student acquires knowledge on various practical aspects, therefore all CO's mapped low with PO's.
PO2	The student able to demonstrate effective planning ability and various skills, therefore all CO's are low mapped with PO2.
PO3	This critical analytical thinking and decision making required hence CO2 and CO3 are mapped with PO3
PO4	There is requirement of applying appropriate methods and procedures therefore, the CO2 and CO3 are mapped with PO4
PO5	Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.
PO6	Understand, analyse and communicate the value of their professional roles in society as health care professionals, promoters of health.
PO7	Apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
PO8	The curriculum helps to understand the other pharmacy subject namely pathophysiology, pharmacology and Pharmacotherapeutics. Which are playing important role to communicate effectively with society, hence all CO's are mapping with PO.
PO9	There is application of knowledge will be acquired to access societal and promotion of health, hence the CO's are mapping with PO's.
PO10	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	The pharmacist shall keep himself/herself updated which required lifelong learning, hence the CO's are mapped moderately with PO's.

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Pharmaceutical Organic Chemistry-I [(Theory) (BP202T)]

After completion of this course student will be able to:

BP202T.1	Classify the organic compounds and compare types of isomerism
BP202T.2	Apply the rules of IUPAC nomenclature, draw structures and name the organic compounds.
BP202T.3	Apply the knowledge of functional groups and explain the methods of preparation and chemical reactivity of organic compounds.
BP202T.4	Analyze the reactivity/stability of organic compounds.
BP202T.5	Explain the structure and uses of various organic compounds.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP202T.1	3	2	1	-	1	1	1	1	1	2	3
BP202T.2	3	2	1	-	1	1	1	1	1	2	3
BP202T.3	3	2	1	2	1	1	1	2	1	2	3
BP202T.4	3	2	1	2	1	1	1	1	2	2	3
BP202T.5	3	-	1	-	1	1	1	1	1	2	3
BP202T	3	2	1	2	1	1	1	1	1	2	3



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Justification for Pharmaceutical Organic Chemistry - I (Theory) (BP202T)

PO1	The course involves the basics of organic chemistry. The knowledge of chemical groups, their properties and reactivity can be further utilized to study the chemistry of pharmaceutical compounds with therapeutic activity. All the objectives are directly associated with deep pharmacy knowledge. Hence, all COs are mapped high.
PO2	Appropriate planning is required to analyse the reactivity and synthesis of organic compounds. Hence, CO1 to CO4 are mapped moderately.
PO3	Students should be able to analyse the reactivity of organic compounds and be able to synthesize it as a task of problem solving including stereochemistry and angular parameters of cyclic compounds. Hence, all COs are mapped moderately.
PO4	Analysing organic compounds and its synthesis often exploit traditional methodology and less implementation of modern tools. Hence, CO3 and CO4 are mapped moderately.
PO5	A team leadership is essential to a considerable extent amongst students while performing practical aspects in this course, may it be analytical data interpretation or selection of synthetic pathways. Hence, all COs are mapped low.
PO6	Understanding chemistry of different organic compounds, their physical and chemical properties, uses and adverse effects would help the students to identify themselves as educators and promoters of health in the society. Hence, CO1 & CO4 are mapped moderate and CO2, CO3 & CO5 are mapped low.
PO7	The course involves synthetic approaches for preparation of different organic compounds involving ethical practices to certain extent. Analytical data for physical constants of fats and oils signify no any ethical compromises. Hence, all COs are mapped low.
PO8	Students should defend the questionnaire regarding selection criteria of synthesis methods and justify the freshness of fats and oils based on analytical constants, where good communication skills are essential. Hence, CO3 is mapped moderate and rest COs are mapped low.
PO9	Understanding use of various organic compounds by students can help awareness amongst layman public thereby leading to better healthcare of the society. Hence, CO4 is mapped moderate and rest COs are mapped low.
PO10	Large amount of solvents and non-renewable resources, including chemicals and gas flame, are exploited in organic synthesis which pose a risk to environmental hazard and is a matter of concern. Hence, all COs are mapped moderately.
PO11	Organic chemistry is a day-to-day changing science, hence needs up-gradation from time-to-time. Therefore, all COs are mapped moderate.

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Pharmaceutical Organic Chemistry-I [(Practical) (BP208P)]

After completion of this course student will be able to:

BP208P.1	Examine various organic compounds by qualitative and quantitative tests.
BP208P.2	Prepare the derivative from organic compounds.
BP208P.3	Analyze different organic compounds by systematic qualitative analysis.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP208P.1	3	2	2	1	2	1	2	2	1	-	3
BP208P.2	3	1	2	1	2	1	2	2	1	2	3
BP208P.3	3	2	2	1	2	1	2	2	1	1	3
BP208P	3	2	2	1	2	1	2	2	1	2	3

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Justification for Pharmaceutical Organic Chemistry - I [(Practical) (BP208P)]

PO1	Students get knowledge about preparation; purification of compounds, determining analytical constants; synthesis of organic compounds which are related to manufacturing practices in pharmacy. So, all COs are mapped high.
PO2	For qualitative analysis of oils, synthesis of compounds & to purify them, requires knowledge with effective planning and time management. Hence, CO1 & CO3 are mapped moderately and CO2 is mapped low.
PO3	Students should be able to think, analyze on different methods for synthesis of organic compounds and apply most suitable ones while performing practical. Hence, all COs are mapped moderately.
PO4	Students will get knowledge about structure drawing tools like chemDraw and ChemSketch; students will also develop skills in handling of sophisticated instruments for the identification of organic compounds. Hence, all COs are mapped low.
PO5	Students will be able to prepare derivatives of organic compounds, perform identification tests, either in group or individually, and report the results accordingly. Hence, all COs are mapped moderately.
PO6	Students will become skilful by performing synthesis of organic compounds & derivatives. Also, identification of organic compounds in future will be helpful for them while working in the research area. Hence, all COs are mapped low.
PO7	Students must follow all the instructions before entering into the practical laboratory as well as they must follow the standard procedure given to get appropriate results. Hence, all COs are mapped moderately.
PO8	Students will achieve intellectual and motor skills and increase knowledge and subject depth by defending the viva-voce. Hence, it would increase the communication skills and it would be helpful for them in future as professionals. So, all COs are mapped moderately.
PO9	Students will get the knowledge about the drug profile, their derivative preparation and identification tests. The above inferences would be helpful while entering into the profession in future. Hence, all COs are mapped low.
PO10	The derivative preparation may be hazardous to the environment as it releases the fumes and pollutes the environment. It would be better to use the green synthesis of organic compounds and the issue can be considered to some extent. Hence, CO2 is mapped moderate and CO3 is mapped low.
PO11	Students will get the knowledge in case of qualitative analysis and identification of organic compounds by chemical tests. Such skills will definitely be useful for students for research purpose as well as at industrial level. Hence, all COs are mapped high.

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Biochemistry [(Theory) (BP203T)]

After completion of this course student will be able to:

BP203T.1	Evaluate metabolism of carbohydrates, lipids and amino acids in physiological and pathological conditions.
BP203T.2	Define genetic organization of mammalian genome.
BP203T.3	Demonstrate structure of DNA & RNA and describe the functions of DNA in the synthesis of RNAs and proteins.
BP203T.4	Explain catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs along with diagnostic applications of enzymes.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP203T.1	3	2	1	2	1	1	1	1	1	1	2
BP203T.2	3	1	1	1	1	1	1	1	1	1	2
BP203T.3	3	1	1	1	1	1	1	1	1	1	2
BP203T.4	3	1	1	2	1	1	1	1	1	1	2
BP203T	3	1	1	2	1	1	1	1	1	1	2



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E - mail – sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com

Justification for Biochemistry [(Theory) (BP203T)]

PO1	Students will understand the basic knowledge related to the various biomolecules which plays major role in drug's mechanism. So, all COs are mapped high.
PO2	Students can develop and implement plans for the design and synthesis of various drugs. So, CO1 is mapped moderate and rest COs are mapped low.
PO3	Students can analyse the role of enzyme inhibition in new drug development and use this information for synthesis of new modified drug and also can analyse various agents involved in the metabolism of lipids, carbohydrates & proteins and apply this information for the betterment of physiological and pathological conditions. So, all COs are mapped low.
PO4	For structural study of various enzymes, enzyme receptor complex and DNA sequence analysis, modern tool and softwares can be used. So CO1 & CO4 are mapped moderately and CO2 & CO3 are mapped low.
PO5	For enzymes, enzyme receptor complex and DNA sequence analysis study modern tool and software's can be used so communication and decision making capacity is required. So, all COs are mapped low.
PO6	Students will able to promote the health, by awaring the society regarding to the role various enzymes and enzyme inhibitors in therapeutics and diagnostic aspects. So, all COs are mapped low.
PO7	Study of biochemical involve preparation, analysis & chemical reactivity of compounds which involves ethical issues. So, all COs are mapped low.
PO8	Students can acquire skills of communication, understanding and to can explore the knowledge gained about various enzymes, mammalian genome and structure of DNA and RNA to pharmacy community at certain extent. Hence, all COs are mapped low.
PO9	Knowledge of use of various biomolecules such as enzymes, carbohydrates, lipids and amino acids and their role in various pathological conditions ensures better healthcare to the society. Hence, all COs are mapped low.
PO10	Synthetic and analytical reactions are carried out during the experiment; it may pollute environment to some extent. So, all COs are mapped low.
PO11	The students shall have all the updated knowledge regarding to the pharmacy profession & the course throughout their life. So, all COs are mapped moderately.

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Biochemistry [(Practical) (BP209P)]

After completion of this course student will be able to:

BP209P.1	Identify carbohydrates, proteins and amino acids by qualitative analysis.
BP209P.2	Evaluate given lipid sample by qualitative tests.
BP209P.3	Define normal and abnormal constituents of urine and blood sample.
BP209P.4	Explain effect of substrate concentration & temperature on enzyme activity of salivary amylase.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP209P.1	2	1	1	2	1	2	1	1	1	1	2
BP209P.2	2	1	1	2	1	2	1	1	1	1	2
BP209P.3	2	1	1	2	1	2	1	1	1	1	2
BP209P.4	2	1	1	2	1	2	1	1	1	1	2
BP209P	2	1	1	2	1	2	1	1	1	1	2

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Justification for Biochemistry [(Practical) (BP209P)]

PO1	Students will understand the basic knowledge related to the various biomolecules which plays major role in drug's mechanism. So, all COs are mapped moderately.
PO2	Students can develop and implement plans for identification of proteins, lipids & carbohydrates and determination of normal and abnormal constituents in urine sample and blood sample. So, all COs are mapped low.
PO3	Student will be able to find and analyse various problems raised during analysis and determination of biomolecules. So, all COs are mapped low.
PO4	For determination and analysis of various constituents by qualitative and quantitative methods, modern tools are used. So, all COs are mapped moderately.
PO5	For enzymes, enzyme receptor complex and DNA sequence analysis study, modern tool and softwares can be used. Here communication skills and decision making capacity is required. So, all COs are mapped low.
PO6	Students will able to promote the health, by awaring the society about the abnormal constituents present in blood and urine and various disorders related to the excess of lipids, proteins and carbohydrates. So, all COs are mapped moderately.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, all COs are mapped low.
PO8	Students can acquire skills of communication, understanding and can explore the knowledge gained about various enzymes, lipids, proteins and carbohydrates and their role in various diseases to pharmacy community at certain extent. Hence, all COs are mapped low.
PO9	Knowledge of use of various medicinal drugs and use of drugs to diagnose and treat the disease ensures better healthcare to the society. Hence, all COs are mapped moderately.
PO10	Synthetic and analytical reactions are carried out during the experiment, so it may pollute the environment to some extent. Hence, all COs are mapped low.
PO11	Being basic subject of pharmacy knowledge, course needs continuous up-gradation of knowledge. Hence, all COs are mapped moderately.

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Pathophysiology [(Theory) (BP204T)]

After completion of this course student will be able to:

BP204T.1	Describe the aetiology and pathogenesis of the selected disease states
BP204T.2	Discuss the sign and symptoms of diseases.
BP204T.3	Identify complications of diseases.
BP204T.4	Estimate most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP204T.1	3	1	3	2	1	2	--	2	3	1	3
BP204T.2	3	1	3	2	--	2	1	2	2	1	2
BP204T.3	3	1	3	2	1	2	1	2	3	--	2
BP204T.4	3	1	3	2	--	2	--	2	2	--	2
BP204T	3	1	3	2	1	2	1	2	2	1	2

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Justification for Pathophysiology [(Theory) (BP204T)]

PO1	The students will acquire strong fundamental concepts and adequate scientific information regarding basic principles of basic knowledge about different diseases by studying aetiology and pathogenesis of the selected disease states which is related with profession of pharmacy. Hence CO1, CO2, CO3, CO4 mapped as high.
PO2	It can develop planning abilities including time management, resource management, delegation skills and organizational skills while studying aetiology & pathogenesis, sign and symptoms & complications of diseases to some extent. Hence CO1, CO2, CO3, CO4 mapped as low.
PO3	Utilizes the principles of scientific enquiry, thinking clearly and critically about diseases and making decisions accordingly. It can help to find, apply information systematically about diseased condition and shall make defensible decisions. Hence CO1,CO2,CO3 mapped as high
PO4	Learn, select, and apply appropriate methods and procedures regarding sign and symptoms of diseases and modern pharmacy-related computing tools related with aetiology and pathogenesis Hence CO1,CO2 mapped as moderate
PO5	It does not 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.
PO6	Understand, analyse and communicate the value of their professional roles in society as health care professionals, promoters of health, Hence CO1,CO2,CO3 mapped as high
PO7	Honouring personal values and applying ethical principles in professional and social contexts is not explained in pathophysiology. It does not demonstrate behaviour that recognizes cultural and personal variability in values, communication and lifestyles. CO1, CO2, CO3, CO4 mapped as low.
PO8	Communicate effectively with the pharmacy community and with society at large, relating with the society about aetiology and pathogenesis, sign and symptoms of diseases
PO9	Apply reasoning informed by the contextual knowledge of aetiology and pathogenesis, complications of diseases to assess societal, health, safety and the consequent responsibilities relevant to the professional pharmacy practice. Hence CO2 mapped as moderate & CO1, CO3 mapped as high.
PO10	Does understand the impact of the professional pharmacy solutions in societal and environmental contexts to minimal extent and demonstrate the knowledge of, and need for sustainable development. Hence CO1, CO2, CO3, CO4 mapped as low.
PO11	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning regarding the aetiology and pathogenesis, sign and symptoms of diseases & also about complications of diseases. Student will self- assess and use feedback effectively from others to identify learning needs. Hence CO2, CO3 mapped as moderate & CO1 mapped as high.

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Computer Applications in Pharmacy (Theory) ((BP205T))

After completion of this course student will be able to:

BP205T.1	Know the various types of application of computers in pharmacy
BP205T.2	Know the various types of databases.
BP205T.3	Know the various applications of databases in pharmacy
BP205T.4	Describe aspects related to Number System and Software Development Life Cycle
BP205T.5	Summarize the objectives and impact of bioinformatics in the field of pharmacy

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP205T.1	3	2	-	3	1	1	1	3	1	-	3
BP205T.2	3	2	3	3	1	-	1	3	1	2	3
BP205T.3	3	2	3	3	1	1	1	3	1	2	3
BP205T.4	3	2	-	3	1	-	1	3	-	-	3
BP205T.5	3	2	-	3	1	-	1	3	1	-	3
BP205T	3	2	3	3	1	1	1	3	1	2	3



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Computer Applications in Pharmacy [(Theory) (BP205T)]

PO1	All the COs are mapped high, as its objectives are directly associated with Pharmacy knowledge
PO2	All the CO's are mapped moderate as its objectives are related with Planning abilities.
PO3	Systematic analysis and evaluation of information can be done using the database queries, hence CO2 and CO3 are mapped high.
PO4	All the COs are mapped high as it enhances the knowledge of all the modern tools.
PO5	All the CO's are mapped low as it enhances the leadership skills
PO6	CO1 and CO3 are mapped low as its objectives are associated with professional identity.
PO7	All the CO's are mapped low as all the objectives are associated with the ethics.
PO8	All the COs are mapped high because as all the objectives are directly associated with effective report generation, presentations, and documentation
PO9	CO1, CO2, CO3 and CO4 are mapped low as all the objectives are associated with the contextual knowledge.
PO10	CO2 and CO3 are mapped moderate as its objectives are directly associated with the demonstration of knowledge.
PO11	Course needs continue up gradation of the knowledge, hence all the CO's are mapped high.

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Computer Applications in Pharmacy (Practical) (BP210P)

After completion of this course student will be able to:

BP210P.1	Use Word Application, and surf online tools.
BP210P.2	Create Web Page using HTML, Database and design a form in MS Access, Invoice, Generate and Print Reports.
BP210P.3	Store and Retrieve in MS Access and Export Tables, Queries, Forms and Reports to Web pages and XML pages.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP210P.1	2	2	2	3	1	-	1	3	1	2	3
BP210P.2	2	2	2	3	1	1	1	3	2	2	3
BP210P.3	2	2	2	3	1	-	1	3	-	-	3
BP210P	2	2	2	3	1	1	1	3	2	2	3

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Justification for Computer Applications in Pharmacy [(Practical) (BP210P)]

PO1	All the COs are mapped moderate as usage of online tools and other application will lead to increase in pharmacy knowledge
PO2	All the CO's are mapped moderate as its objectives are related with Planning abilities.
PO3	Systematic analysis and evaluation of information can be done using the database queries, hence CO2 and CO3 are mapped high
PO4	All the COs are mapped high as it enhances the knowledge of all the modern tools.
PO5	All the CO's are mapped low as it enhances the leadership skills
PO6	CO2 is mapped low as its objectives are associated with professional identity.
PO7	All the CO's are mapped low as all the objectives are associated with the ethics.
PO8	All the COs are mapped high because as all the objectives are directly associated with effective report generations, presentations and documentation
PO9	CO1 and CO2 are mapped moderate as contextual knowledge can be gained using online tools.
PO10	CO1 and CO2 are mapped moderate as its objectives are directly associated with the demonstration of knowledge.
PO11	Course needs continuous up gradation of the knowledge, hence all the CO's are mapped high.

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Pharmaceutical Organic Chemistry II [(Theory) (BP201T)]

After completion of this course student will be able to:

BP201T.1	Analyze resonating structures in Benzene and explain reactivity & orientation of Benzene towards electrophilic substitution reactions.
BP201T.2	Predict the effect of substituents on chemical nature of aromatic amine, aromatic acids and phenols along with their methods of preparation.
BP201T.3	Determine analytical constants of fats & oils.
BP201T.4	Explain the chemistry, synthesis and reactivity of Polynuclear hydrocarbons
BP201T.5	Illustrate stability theories & reactions of cyclopropane and cyclobutane.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP201T.1	3	2	2	1	1	2	1	1	1	2	2
BP201T.2	3	2	2	1	1	1	1	1	1	2	2
BP201T.3	3	2	2	1	1	1	1	2	1	1	2
BP201T.4	3	2	2	1	1	2	1	1	2	2	2
BP201T.5	3	1	2	1	1	1	1	1	1	1	2
BP201T	3	2	2	1	1	1	1	1	1	2	2



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Justification for Pharmaceutical Organic Chemistry II [(Theory) (BP201T)]

PO1	The course involves the basics of organic chemistry. The knowledge of chemical groups, their properties and reactivity can be further utilized to study the chemistry of pharmaceutical compounds with therapeutic activity. All the objectives are directly associated with deep pharmacy knowledge. Hence, all COs are mapped high.
PO2	Appropriate planning is required to analyze the reactivity and synthesis of organic compounds. Hence, CO1 to CO4 are mapped moderately and CO5 is mapped low.
PO3	Students should be able to analyze the reactivity of organic compounds and be able to synthesize it as a task of problem solving including stereochemistry and angular parameters of cyclic compounds. Hence, all COs are mapped moderately.
PO4	Analyzing organic compounds and its synthesis often exploit traditional methodology and less implementation of modern tools. Hence, all COs are mapped low.
PO5	A team leadership is essential to a considerable extent amongst students while performing practical aspects in this course, may it be analytical data interpretation or selection of synthetic pathways. Hence, all COs are mapped low.
PO6	Understanding chemistry of different organic compounds, their physical and chemical properties, uses and adverse effects would help the students to identify themselves as educators and promoters of health in the society. Hence, CO1 & CO4 are mapped moderate and CO2, CO3 & CO5 are mapped low.
PO7	The course involves synthetic approaches for preparation of different organic compounds involving ethical practices to certain extent. Analytical data for physical constants of fats and oils signify no any ethical compromises. Hence, all COs are mapped low.
PO8	Students should defend the questionnaire regarding selection criteria of synthesis methods and justify the freshness of fats and oils based on analytical constants, where good communication skills are essential. Hence, CO3 is mapped moderate and rest COs are mapped low.
PO9	Understanding use of various organic compounds by students can help awareness amongst layman public thereby leading to better healthcare of the society. Hence, CO4 is mapped moderate and rest COs are mapped low.
PO10	Large amount of solvents and non-renewable resources, including chemicals and gas flame, are exploited in organic synthesis which pose a risk to environmental hazard and is a matter of concern. Hence, CO1, CO2 & CO4 are mapped moderate and CO3 & CO5 are mapped low.
PO11	Organic chemistry is a day-to-day changing science, hence needs up-gradation from time-to-time. Therefore, all COs are mapped moderate.

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Pharmaceutical Organic Chemistry – II [(Practical) (BP305P)]

After completion of this course student will be able to:

BP305P.1	Synthesize organic compounds & its derivatives.
BP305P.2	Purify synthesized organic compounds by recrystallization methods.
BP305P.3	Determine analytical constants of fats & oils by titrimetric methods.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP305P.1	3	2	3	2	2	1	2	1	2	2	3
BP305P.2	3	2	3	1	2	1	2	1	3	1	3
BP305P.3	3	2	3	2	2	1	2	2	2	2	3



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Justification for Pharmaceutical Organic Chemistry – II [(Practical) (BP305P)]

PO1	The course involves the basic preparation of organic compounds, which utilise pharmacy core knowledge. Hence, all COs are mapped high.
PO2	Appropriate planning is required to set-up synthesis assembly for preparation of organic compounds. Hence, all COs are mapped moderately.
PO3	Problem solving skills will enhance decision making capacity amongst students during the preparation of organic compounds. Hence, all COs are mapped high.
PO4	Organic synthesis procedures involve use of equipment and tools for determining analytical constants eg. boiling & melting range. Hence, CO1 & CO3 are mapped high and CO2 is mapped low.
PO5	A team leadership is essential in synthetic procedures and ensuring completion of reactions. Hence, all COs are mapped moderate.
PO6	Organic chemistry, its uses and implementation can help students to promote better healthcare and hygiene concern in the society. However, all COs are mapped low.
PO7	Students should follow ethical principles in preparation, analysis & synthesis of organic compounds. Hence, all COs are mapped moderately.
PO8	Communication skills are important to enumerate the importance of organic chemistry, analytical data of fats in common household etc. Hence, CO3 is mapped moderate and rest COs are mapped low.
PO9	It is important to accurately determine total fat content of food for hygiene and health concerned reasons, in-turn contributing to good healthcare of the society. Hence, CO2 is mapped high whereas CO1 & CO3 are mapped moderately.
PO10	Green chemistry approach minimizes the effect & use of hazardous substances on the environment & human health. Hence, CO1 and CO3 are mapped moderately whereas CO2 is mapped low.
PO11	The practical course needs up-gradation since newer synthetic approaches or retrosynthetic pathways can be more relevant and economically feasible. Therefore, all COs are mapped high.

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Justification for Physical Pharmaceutics I [(Theory) BP302T

After completion of this course student will be able to:

BP302T.1	Explain solubility principles in biological system and manufacturing in different formulation.
BP302T.2	Define various physicochemical properties of drug molecules in the designing the dosage forms and evaluation.
BP302T.3	Explain the role of surfactant, interfacial Phenomenon and complexation in formulation of dosage forms.
BP302T.4	Explain the concept of pH buffer of solutions in Pharmaceutical and biological Systems.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP302T.1	3	3	2	2	1	1	2	-	1	-	3
BP302T.2	3	3	2	2	-	2	1	-	1	-	3
BP302T.3	3	2	3	3	-	1	2	1	-	1	3
BP302T.4	3	2	3	3	1	1	1	-	-	-	3
BP302T	3	3	2	3	1	2	2	1	1	1	3



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Physical Pharmaceutics I [(Theory) BP302T

PO1	The curriculum provides the knowledge of solution with different solubility expression and determine solubility of drug. Hence, all CO's are mapped high
PO2	Students will only able to understand various physicochemical properties of drug molecules in the designing the dosage forms Hence, all COs are mapped high
PO3	Students will be able to think analytically and solve the problems on scientific basis. Hence, CO3 is mapped moderately
PO4	Students will utilize appropriate methods and tools to evaluate and apply the information systematically. Hence CO4 are mapped high
PO5	Students will understand co-working and co-operation, which in turn will help them understand team building, Hence CO5 is mapped low
PO6	The theoretical concepts and practical knowledge will help to create professional mindset in the students and take their work responsibly. Hence, mapping is done moderately.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, CO2 are mapped moderately.
PO8	Students will develop good communication skills will be able to write effectively reports and make presentations. Hence, all CO's are mapped low.
PO9	The contents of the syllabus do not obligate any societal consideration. Hence, low mapping.
PO10	No curriculum content is related to the environment and sustainability. Hence, low mapping.
PO11	The students shall keep themselves updated, which requires lifelong learning. Hence, all CO's are mapped high.

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Physical Pharmaceutics I [(Practical) (BP306P)]

After completion of this course student will be able to:

BP306P .1	Apply the concept of solubility, surface tension and interfacial tension in the field of Pharmacy.
BP306P .2	Evaluation of Partition co- efficient of solution in different solvents.
BP306P .3	Analyze Complexation methods for stability of drugs.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP306P.1	2	-	2	1	2	1	1	1	1	1	2
BP306P.2	2	-	2	1	2	2	1	-	2	2	2
BP306P.3	2	1	1	2	2	2	-	1	2	2	2
BP306P	2	1	2	2	2	2	1	1	2	2	2

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Justification for Physical Pharmaceutics-I [(Practical) (BP306P)]

PO1	Students will able to understand the concepts of solubility, surface tension and interfacial tension of liquids Hence, all COs are mapped moderately
PO2	Students develop effective planning skills demonstrate the physicochemical properties of material in development of stable and effective dosage form. Hence, all COs are mapped low.
PO3	Students will be able to think analytically which helps in solving the problems on scientific base by utilizing different analytical techniques and modern tools. Hence, all COs are mapped moderately.
PO4	Students acquire the modern analytical tools for concepts of solubility, surface tension and interfacial tension of liquids and they will be able to take proper decision while formulating dosage forms. Hence, all COs mapped moderately.
PO5	Students will have to work in groups and coordinate among team members to formulate formulation and evaluation. Hence the Cos are mapped moderately.
PO6	The theoretical concepts and practical knowledge will help to create professional mindset in the students and take their work responsibly. Hence, mapping is done moderately
PO7	Students will able to apply ethical principles in professional and social contexts. Hence, all COs are mapped low.
PO8	Students will develop good communication skills and able to write reports effectively and make presentations. Hence, there Cos are mapped low
PO9	Students will able to connect with social and legal issues of professional pharmacy practice. Hence, COs are mapped moderately
PO10	Students will establish relationship with the environment and sustainability. CO are mapped moderately.
PO11	The students shall keep themselves updated, which requires lifelong learning Hence all COs are mapped moderately.

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 E - mail – sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com

Pharmaceutical Microbiology (Theory) BP303T

After completion of this course student will be able to:

BP303T.1	Demonstrate various methods of cultivation, identification and preservation of microorganisms
BP303T.2	Apply suitable methods of sterilization and implement in pharmaceutical industry
BP303T.3	Explain the concept of micro biocidal evaluation and differentiate various methods.
BP303T.4	Implement the concept of aseptic area and clean area in manufacturing of pharmaceuticals and design microbiological and antibiotic assay.
BP303T.5	Explain the reasons for microbial spoilage of pharmaceuticals and apply the knowledge of animal cell culture techniques in pharma industry.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP303T.1	3	2	1	3	-	1	2	2	1	2	3
BP303T.2	3	1	2	2	-	1	2	2	-	2	3
BP303T.3	3	2	3	3	1	1	1	2	1	1	3
BP303T.4	3	2	2	3	1	1	2	2	1	2	3
BP303T.5	3	2	1	2	1	1	2	2	2	3	3
BP101T	3	2	2	3	1	1	2	2	1	2	3



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Justification for Pharmaceutical Microbiology (Theory) BP303T

PO1	The curriculum provides the knowledge of different properties of the microorganisms and their features useful in pharmacy. Hence, all CO's are mapped high.
PO2	Students would be able to plan and demonstrate different experimentations related to the microbial properties life structure and movement of microbes. Hence, all CO's are mapped moderately.
PO3	Students will be able to think analytically and solve the problems on scientific basis. Hence, CO1, CO2 and CO3 are mapped moderately.
PO4	Students will utilize appropriate methods and tools to evaluate and apply the information systematically. Hence, COs are mapped high.
PO5	Students will work in groups and coordinate among team members for observing microbes under microscopes. Hence, COs are mapped low.
PO6	The curriculum would be the foundation for further pharmacy concepts and as such does not provide any professional identity in itself. Hence no mapping.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, COs are mapped moderately.
PO8	Students will develop good communication skills will be able to draw microbial structures and elucidate the information from other indicators. Hence, all CO's are mapped moderately.
PO9	Considering societal status of infectious diseases, the student will add further awareness for microbial infections. Hence, CO's are mapped low.
PO10	Considering environmental status of infectious diseases, the student will add further awareness for microbial infections. Hence, CO's are mapped moderately.
PO11	The students shall keep themselves updated, which requires lifelong learning. Hence, all CO's are mapped high.

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Pharmaceutical Microbiology (Practical) BP307P

After completion of this course student will be able to:

BP307P.1	Demonstrate aseptic and pure culture techniques with competency to handle various equipment and predict utilization of microbiological media.
BP307P.2	Implement appropriate methods for isolation, identification and enumeration of microorganisms.
BP307P.3	Evaluate the efficacy of antimicrobial agent using reliable protocol and perform test for sterility and antimicrobial assay.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP307P.1	3	2	1	3	2	1	2	2	1	2	3
BP307P.2	3	1	2	2	2	1	2	2	1	2	3
BP307P.3	3	2	3	3	1	-	1	2	1	1	3
BP101T	3	2	2	3	2	1	2	2	1	2	3

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Justification for Pharmaceutical Microbiology (Practical) BP307P

PO1	The curriculum provides the knowledge of different properties of the microorganisms and their features useful in pharmacy. Hence, all CO's are mapped high.
PO2	Students would be able to plan and demonstrate different experimentations related to the microbial properties life structure and movement of microbes. Hence, all CO's are mapped moderately.
PO3	Students will be able to think analytically and solve the problems on scientific basis. Hence, CO1, CO2 and CO3 are mapped moderately.
PO4	Students will utilize appropriate methods and tools to evaluate and apply the information systematically. Hence, COs are mapped high.
PO5	Students will work in groups and coordinate among team members for observing microbes under microscopes. Hence, COs are mapped moderately.
PO6	The curriculum would be the foundation for further pharmacy concepts and as such does not provide any professional identity in itself. Hence low mapping.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, COs are mapped moderately.
PO8	Students will develop good communication skills will be able to draw microbial structures and elucidate the information from other indicators. Hence, all CO's are mapped moderately.
PO9	Considering societal status of infectious diseases, the student will add further awareness for microbial infections. Hence, CO's are mapped low.
PO10	Considering environmental status of infectious diseases, the student will add further awareness for microbial infections. Hence, CO's are mapped moderately.
PO11	The students shall keep themselves updated, which requires lifelong learning. Hence, all CO's are mapped moderately.

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Pharmaceutical Engineering (Theory) BP304T

After completion of this course student will be able to:

BP304T.1	Explain various unit operations & the material handling techniques used in pharmaceutical industries.
BP304T.2	Perform various processes involved in pharmaceutical manufacturing process.
BP304T.3	Design plant lay out for optimum use of resources.
BP304T.4	Apply the various preventive methods to prevent environmental pollution and corrosion in Pharmaceutical industries.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP304T.1	3	2	1	3	2	-	-	-	-	-	3
BP304T.2	3	2	3	2	2	2	-	2	2	-	3
BP304T.3	3	-	2	2	2	2	-	2	2	3	3
BP304T.4	3	3	2	2	2	1	-	-	-	3	3
BP304T	3	2	2	2	2	2	-	2	2	3	3



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Justification for Pharmaceutical Engineering (Theory) BP304T

PO1	All COs give basic knowledge about pharmacy regarding pharmaceutical sciences, manufacturing practices. So, all COs mapped high.
PO2	Students can learn about planning of work, time management, organizational skills for pharmaceutical manufacturing process, to design plant layout & to control corrosion in pharmaceutical industry. Hence all COs mapped moderate.
PO3	Students able to solve problem by their thinking ability & scientific knowledge on daily operation, So all COs mapped moderate.
PO4	Students able to learn modern tool regarding equipment which used in pharmaceutical industry. So all COs mapped moderate.
PO5	Students develop their leadership skill while performing manufacturing process, test to prevent environmental pollution & by designing the plant layout for optimum use of resource, Hence all COs mapped moderate.
PO6	By performing test to prevent environment pollution students learn to analyse & communicate professional roles in society, Hence all COs mapped moderate.
PO7	The COs cannot be mapped.
PO8	While performing manufacturing process & test to prevent environmental pollution students learn to communicate effectively & to make documentation properly. Hence COs mapped moderate.
PO9	Students gain knowledge about safety, legal issues while learning about test for prevention of pollution & for plant layout. So all COs mapped moderate.
PO10	Students can learn about environment & sustainability while getting knowledge about test to prevent environmental pollution, designing of plant layout for optimum use of resources & preventive methods of corrosion. So COs mapped high.
PO11	Students get knowledge which is required for life-long. So, all COs mapped high.

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Pharmaceutical Engineering (Practical) BP308P

After completion of this course student will be able to:

BP308P.1	Demonstrate the handling of various equipment used in pharmaceutical industry
BP308P.2	Perform, evaluate, and interpret the size reduction, size separation, drying process, filtration and its significance in manufacturing process.
BP308P.3	Evaluate various methods of mixing process and assessing efficacy of mixing techniques.
BP308P.4	Implement and incorporate various methods of preparation of crystals and compare their size and yield.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP308P.1	3	2	2	2	2	1	-	2	-	-	3
BP308P.2	3	3	3	2	2	1	1	2	-	1	3
BP308P.3	3	3	3	2	2	1	1	2	-	1	3
BP308P.4	3	2	2	2	2	1	1	2	-	1	3
BP308P	3	3	3	2	2	1	1	2	-	1	3



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Justification for Pharmaceutical Engineering (Practical) BP308P

PO1	Students will understand the principles and handling of equipment and unit operations. Hence, all COs are mapped high.
PO2	Students develop to plan and implement various pharmaceutical process and evaluate the results. Hence, all COs are mapped high.
PO3	Students will be thinking analytically, solve problems and making conclusions pertaining to unit operations. Hence, all COs are mapped high.
PO4	Students will learn and understand various modern tool regarding instruments, practical. So all COs are mapped high.
PO5	Students will learn the all practical skills and work in team and can build their leadership skill. So all COs mapped moderate.
PO6	By performing practical, students can grow their professional identity. Hence COs mapped low.
PO7	Students would develop pharmaceutical ethics and follow in their profession always. Hence, COs mapped low.
PO8	Students will be able to express and explain the skills learnt in the Laboratory hence COs mapped moderate
PO9	The COs cannot be mapped.
PO10	Students will be able to consider environmental constraints for the chemicals and reagents involved in unit operations. Hence, COs mapped low.
PO11	Students will acquire and can reproduce the skills obtained in Pharmaceutical Engineering Labs in the industry. Hence, COs mapped high.

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Pharmaceutical Organic Chemistry – III [(Theory) (BP401T)]

After completion of this course student will be able to:

BP401T.1	Discuss reactivity and methods of preparation of organic compounds.
BP401T.2	Explain stereo chemical aspects of organic compounds.
BP401T.3	Deduce the nomenclature & conformations of geometric isomerism.
BP401T.4	Design synthesis, reactions & aromaticity of heterocyclic compounds.
BP401T.5	Elaborate medicinal uses of heterocyclic compounds.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP401T.1	3	2	2	1	1	2	1	1	1	2	2
BP401T.2	3	2	2	1	1	1	1	1	1	1	2
BP401T.3	3	2	1	1	1	1	1	1	1	1	2
BP401T.4	3	2	2	1	1	2	1	1	1	2	2
BP401T.5	3	2	1	1	1	2	1	2	1	1	2
BP401T	3	2	2	1	1	2	1	1	1	1	2



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Justification for Pharmaceutical Organic Chemistry – III [(Theory) (BP401T)]

PO1	This part of the course involves the study of heterocyclic compounds, in-turn associated greatly with pharmacy knowledge. Hence, all COs are mapped high.
PO2	Good planning is required to describe chemistry of heterocyclic compounds. Hence, all COs are mapped moderate.
PO3	Students should be able to analyze the reactivity of heterocyclic compounds as a task of problem solving including stereoselectivity & stereospecificity. Hence, CO1, CO2 & CO4 are mapped moderate and CO3 & CO5 are mapped low.
PO4	Heterocyclic chemistry is associated with traditional methods of synthesis and modern tools and equipment are less consumed in the course. Hence, all COs are mapped low.
PO5	A good leadership skills will help better understand approaches and concepts in heterocyclic chemistry amongst students in group discussion task, to a considerable extent. Hence, all COs are mapped low.
PO6	Students should be able to express chemistry of different heterocyclic compounds, their physical and chemical properties, reactivity, uses and adverse effects to the society as a role of educators and promoters of social well-being. Hence, CO1, CO4 & CO5 are mapped moderate and CO2 & CO3 are mapped low.
PO7	The course involves study of heterocyclic compounds involving ethical issues to certain extent. Hence, all COs are mapped low.
PO8	Students should explain and justify stereochemistry of heterocyclic compounds. Hence, CO5 is mapped moderate and rest COs are mapped low.
PO9	Understanding chemistry of various heterocyclic compounds by students can help deliver a conscience of awareness and awakening towards better healthcare of the society. Hence, all COs are mapped low.
PO10	Heterocyclic synthesis promotes use of chemicals, solvents which may not always be green. Hence, it may pose a risk of environmental hazard. Hence, CO1 & CO4 are mapped moderate and rest COs are mapped low.
PO11	Heterocyclic chemistry needs up-gradation since its applications are useful in life-long learning. Considerably, all COs are mapped moderate.

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 E - mail - sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com

Medicinal Chemistry-I [(Theory) (BP402T)]

After completion of this course student will be able to:

BP402.1	Explain the correlation of physicochemical properties & drug action at its receptor sites.
BP402.2	Explain the drug metabolism principles and analyze phase I and Phase II reactions.
BP402.3	Illustrate mode of action, biosynthetic and metabolic pathways of different drug molecules.
BP402.4	Correlate the relationship between the structure and biological activity of drug molecules.
BP402.5	Outline the synthesis of the different ANS and CNS, NSAID drugs.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP402.1	3	1	1	2	1	1	2	2	1	-	2
BP402.2	3	2	1	2	2	2	2	2	2	1	2
BP402.3	3	2	1	2	2	1	2	2	1	1	2
BP402.4	3	2	1	2	2	2	2	2	1	1	2
BP402.5	3	1	1	2	2	1	2	2	1	1	2



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Justification for Medicinal Chemistry-I [(Theory) (BP402T)]

PO1	Pharmacy knowledge is greatly utilised in synthesis, spectrum of activity, mode of action, ADRs and SAR studies of different medicinal agents. Hence, all COs are mapped high.
PO2	Time management and planning ability is essential in synthesis, metabolism and SAR interpretation of different medicinal agents. Hence, CO1 is mapped low, but rest COs are mapped moderate.
PO3	Synthetic methods and descriptive pharmacokinetics of medicinal agents are helpful in problem analysis. Hence, all COs are mapped low.
PO4	Nomenclature and structure drawing tools like ChemSketch, ChemDraw etc. are used by students to master practice of drawing structures online. Hence, all COs are mapped moderately on account of modern tool usage.
PO5	Students will be able to inculcate the skill of personality development and leadership qualities during the practical procedures, may be not to a greater extent. Hence, CO1 is mapped low and rest COs are mapped moderate.
PO6	Students shall develop good healthcare services to society as a part of profession, understanding the concepts in medicinal chemistry and side effects of chemotherapy. Hence, CO2 & CO4 are mapped moderate and rest COs are mapped low.
PO7	The course is involved in ethical aspects of pharma profession as well as industry. Hence, all COs are mapped moderate.
PO8	Good communication skills are required to counsel the patients for safe use of medicinal agents and appropriate consumption. Hence, all COs are mapped moderately.
PO9	The course signifies a good healthcare service to the society with proper knowledge of medicinal agents. Hence, CO2 is mapped moderate and rest COs are mapped low.
PO10	Synthesis of drugs & its application in chemistry has to be monitored by green approach at maximum level, considering environmental factors. Hence, CO2, CO3 & CO4 are mapped low.
PO11	The course needs up-gradation for life-long learning. Medicinal Chemistry is a day-to-day changing science, hence students need to know about recent trends and updates in traditional learning. Hence all COs are mapped moderate.

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Medicinal Chemistry-I [(Practical) (BP406P)]

After completion of this course student will be able to:

BP406.1	Explain reactions and principle involved in synthesis of medicinal agents.
BP406.2	Standardize prepared titrants using volumetric principles.
BP406.3	Synthesize medicinal agents by appropriate chemical reactions and purify them by recrystallization methods.
BP406.4	Determine partition coefficient of substance under study.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP406.1	3	1	2	2	2	1	1	2	1	-	2
BP406.2	3	2	2	2	1	1	2	2	1	-	2
BP406.3	3	2	2	2	2	2	2	2	1	3	2
BP406.4	3	2	2	2	1	2	1	2	1	1	2
BP406	3	2	2	2	2	2	2	2	1	2	2

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Justification for Medicinal Chemistry-I [(Practical) (BP406P)]

PO1	Pharmacy knowledge is the basis in designing reaction mechanism and synthetic pathway of different medicinal agents. Hence, all COs are mapped high.
PO2	Good planning is required in synthesis of medicinal agents as well as to carry out titration-based analytical assay of marketed formulation. All synthetic procedures are time-bound too. Hence, CO1 is mapped low and rest COs are mapped moderate.
PO3	Solubility and stability issues of intermediates and final products are overcome by students as a part of problem solving state. Hence, all COs are mapped moderate.
PO4	Work-up of finished product demands modern equipments and tools. Hence, all COs are mapped moderate.
PO5	Practicals involving synthesis of drugs require good leadership skills, may be not to a great extent. Hence, all CO1 & CO3 are mapped moderate and CO2 & CO4 are mapped low.
PO6	A good professional identity is developed amongst students as a part of group activity during the practical hours of the course. Hence, CO1 & CO2 are mapped low and CO3 & CO4 are mapped moderate.
PO7	Students should follow professional behaviour during the laboratory working as per the regimentation of the course. Hence, CO1 & CO4 are mapped low and CO2 & CO3 is mapped high.
PO8	Good communication is required to defend the viva-voce on the principle and procedure involved in the synthesis of medicinal agents and assay of marketed formulations. Hence, all COs are mapped moderate.
PO9	Synthesis of medicinal agents, its purification and quantitative analytical assay acclaims good interlink between the pharma sector and society, may be to a lesser extent. Hence, all COs are mapped low.
PO10	Synthesis of medicinal agents involves use of heavy solvents, expensive catalysts, chemicals and raw materials etc. This may pose an environmental risk of pollution overcome by green chemistry. Accordingly, CO3 is mapped high and CO4 is mapped low.
PO11	Medicinal Chemistry practical course needs up-gradation each time to compensate any easy methods of synthesis. Hence, all COs are mapped moderately.

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Physical Pharmaceutics-II [(Theory) (BP403T)]

After completion of this course student will be able to:

BP403T.1	Explain various types, preparation, purification, and properties of colloids.
BP403T.2	Describe the theory, physicochemical and evaluation methods for coarse dispersions
BP403T.3	Demonstrate the use of physicochemical properties in the formulation development and evaluation of dosage forms.
BP403T.4	Define the principles of chemical kinetics and use them for stability testing and determination of the shelf life of formulations.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP403T.1	3	2	2	3	2	1	1	2	1	-	3
BP403T.2	3	2	2	3	2	1	1	2	1	-	2
BP403T.3	3	1	2	2	1	1	1	2	1	-	3
BP403T.4	3	2	2	3	2	1	1	2	1	-	3
BP403T	3	2	2	3	2	1	1	2	1	-	3

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Justification for Physical Pharmaceutics-II [(Theory) (BP403T)]

PO1	The curriculum provides the knowledge of physical properties of the drug molecules types, preparation, purification, properties and pharmaceutical formulation. Hence, COs are mapped High.
PO2	Students would be able to plan and demonstrate the physicochemical properties of material in development of stable and effective dosage form. Hence, all CO's are mapped Medium.
PO3	Students will be able to think analytically and solve the problems on scientific basis. Hence, All COs is mapped medium.
PO4	Students will utilize appropriate methods and tools to evaluate and apply the information systematically. Hence, CO1,CO2 and,CO4 mapped High
PO5	Students will work in groups and coordinate among team members. Hence, are mapped medium.
PO6	The curriculum would be the foundation for further pharmacy concepts as such does not provide any professional identity in itself. Hence mapped Low.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, Hence mapped Low.
PO8	Students will develop good communication skills will be able to write effectively reports and make presentations. Hence, all CO's are mapped medium.
PO9	The contents of the syllabus do not obligate any societal consideration. Hence mapped low.
PO10	No curriculum content is related to the environment and sustainability. Hence, no mapping
PO11	The students shall keep themselves updated, which requires lifelong learning. Hence, all CO's are mapped High.

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Physical Pharmaceutics-II [(Practical) (BP403P)]

After completion of this course student will be able to:

BP403P.1	Evaluate physicochemical properties of the drugs, excipients and dosage forms
BP403P.2	Determine the rate constant and order of reaction to assess their stability and predict the shelf life of Pharmaceuticals.
BP403P.3	Formulate coarse dispersions and colloidal dispersions and evaluate their efficacy.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP403T.1	3	2	2	3	2	1	1	2	1	-	3
BP403T.2	3	2	2	3	2	-	1	2	-	-	2
BP403T.3	3	1	2	2	1	1	1	2	1	-	3
BP403T	3	2	2	3	2	1	1	2	1	-	3

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Justification for Physical Pharmaceutics-II [(Practical) (BP403P)]

PO1	Students the concepts of pharmaceutical formulation and evaluation of physicochemical properties of drug and dosage forms. Hence, all COs are mapped High.
PO2	Students develop effective planning skills demonstrate the physicochemical properties of material in development of stable and effective dosage form. Hence, all COs are mapped medium.
PO3	Students will be able to think analytically which helps in solving the problems on scientific base by utilizing different analytical techniques and modern tools. Hence, all COs are mapped medium.
PO4	Students acquire the modern analytical tools for evaluation of physicochemical properties of drug and dosage forms and will be able to take proper decision while formulating dosage forms. Hence, all COs mapped High.
PO5	Students will have to work in groups and coordinate among team members to formulate formulation and evaluation. Therefore, all COs mapped medium.
PO6	The curriculum is not related to analysing and communicating the value of the roles in the society. Hence, mapping is Low.
PO7	Students are able to apply ethical principles in professional and social contexts. Hence, all COs are mapped low
PO8	Students will good communication skills will be able to write reports effectively and make presentations. Hence, all COs are mapped Medium.
PO9	No curriculum content is related to the social and legal issues of professional pharmacy practice. Hence, mapped low.
PO10	No curriculum content is related to the environment and sustainability. Hence there is no mapping
PO11	The students shall keep themselves updated, which requires lifelong learning Hence all COs are mapped High.

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E - mail - sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com

Pharmacology I [(Theory) (BP 404 T)]

After completion of this course student will be able to:

BP404 T.1	Explain pharmacological actions of different categories of drug
BP 404 T.2	Evaluate mechanism of drug action at organ system, sub cellular and macromolecular levels
BP 404 T.3	Apply basic pharmacological knowledge in the prevention and treatment of various diseases
BP 404 T.4	Implement the effect of drugs on animals by simulated experiments.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 404 T 1	3	1	2	1	1	2	1	1	2	1	2
BP 404 T 2	3	1	1	2	1	1	1	1	2	1	2
BP 404 T 3	3	2	2	1	1	2	1	1	2	1	2
BP 404 T 4	3	2	1	2	1	1	1	1	2	1	2
BP 404 T	3	1	1	1	1	1	1	1	2	1	2



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Justification for Pharmacology I [(Theory) (BP 404 T)]

PO1	Students will understand the basic pharmacy knowledge related to the various categories of drugs and effect of drugs on body and can able to use this knowledge in the prevention and treatment of diseases and disorders. So all the Cos are mapped high.
PO2	Students can develop and implement plans for studying the actions of various drugs on animal model and also able to plan, how the treatment does should be through the various steps for the prevention of diseases mapped moderately. So CO3 and CO4 mapped moderately and CO1,CO2 mapped low
PO3	Student can able to find and analyse the various disease in the population and apply the knowledge of drugs and drug actions, in the prevention and treatment of diseases. So CO1 and CO3 mapped moderately and CO2, CO4 mapped low
PO4	For study of action of drug on various tissues, cell and animals there is use of different instruments and models, so CO1, CO3 mapped low and CO2, CO4 mapped moderately.
PO5	Through knowledge of various disease student can guide the society about the improvement in health and well-being, so all COs mapped low
PO6	Students will able to promote the health, by awaring the society about the various therapeutics and diagnostic uses of different categories of drug. So CO1 and CO3 mapped moderately and CO2, CO4 mapped low.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, all COs are mapped low.
PO8	Students can acquire skills of communication, understanding and to can explore the knowledge gained about various drugs, their actions and use of drug in the treatment of disease to society at certain extent. Hence all Cos are mapped low.
PO9	Knowledge of use of various medicinal drugs and use of drugs to diagnose and treat the disease ensures better healthcare to the society. Hence all Cos mapped moderately.
PO10	Students gain the depth knowledge about Understanding the prescription pattern and rational use of drugs by performing case study or doing hospital visit or solving problems and making decisions during daily practice, so all COs mapped low.
PO11	Being core subject of pharmacy, course needs continue upgradation of knowledge, hence all COs are mapped moderately.

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Pharmacology I [(Practical) (BP 404 P)]

After completion of this course student will be able to:

BP404 P 1	Explain commonly used instruments in experimental pharmacology
BP 404 P 2	Demonstrate common laboratory animals and various routes of drug administration in animals and common laboratory techniques.
BP 404 P 3	Evaluate skeletal muscle relaxants activity, Anticonvulsant, anxiolytic activity and locomotor activity in various laboratory animals

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 404 P 1	3	2	1	2	1	1	1	1	1	1	2
BP 404 P 2	3	1	1	2	1	1	1	1	1	1	2
BP 404 P 3	3	1	2	2	1	2	1	1	1	1	3
BP 404 P	3	1	1	2	1	1	1	1	1	1	2

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Justification for Pharmacology I [(Practical) (BP 404 P)]

PO1	As a core subject of pharmacy, all the objectives are directly associated with pharmacy knowledge. So, all Cos are mapped high
PO2	The students will able to plan the drug therapy and management of various disease by studying the drugs on animal model. So, CO1 mapped moderately and CO2, CO3 mapped low.
PO3	Student can able to find and analyze the various disease in the population and apply the knowledge of drugs and drug actions, in the prevention and treatment of diseases. So, CO1, CO2 mapped low and CO3 mapped moderately.
PO4	For study of action of drug on various tissues, cell and animals there is use of different instruments and models, so all COs mapped moderately.
PO5	Through knowledge of various disease student can guide the society about the improvement in health and well-being, So all CO's mapped low.
PO6	Students will able to promote the health, by awaring the society about the various therapeutics and diagnostic uses of different categories of drug. So all Cos mapped low and CO3 mapped moderately.
PO7	No curriculum content is related to the pharmaceutical ethics, so all COs mapped low.
PO8	Students gain the skills to communicate, comprehend and present the technical knowledge gained about drug products to pharmacy community and society. So, all CO's mapped low.
PO9	To know the detail the classification, mechanism of action, pharmacological actions, pharmacokinetics, therapeutic uses, adverse effects, drug interactions, contraindications, dosages of drugs. So, all CO's mapped low.
PO10	Students gain the depth knowledge about Understanding the prescription pattern and rational use of drugs by performing case study or doing hospital visit or solving problems and making decisions during daily practice, so all CO's mapped low.
PO11	Being core subject of Pharmacy, course needs continue up gradation of the knowledge & to Self-access and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

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Pharmacognosy & Phytochemistry-I [(Theory) (BP405T)]

After completion of this course student will be able to:

BP405T.1	Define Pharmacognosy, express its history and scope and recall the various classes of crude drugs and execute the evaluation of adulterants present in them
BP405T.2	Explain and execute the general methods of cultivation, collection, storage, of medicinal plants and compare the various conservation methods.
BP405T.3	Explain the various techniques of tissue culture and execute its application in pharmacognosy
BP405T.4	Define and apply the knowledge of alternative system of medicine in herbal drug technology and illustrate the different secondary metabolites and their pharmaceutical importance
BP405T.5	List out the various natural primary metabolites and explain their source and method of preparation including those from marine source

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP405T.1	3	1	2	1	-	1	1	1	1	-	3
BP405T.2	3	1	2	-	2	1	2	2	2	2	3
BP405T.3	3	-	2	2	-	1	1	1	-	1	3
BP405T.4	3	-	2	-	2	1	1	1	2	1	3
BP405T.5	3	1	-	2	-	1	2	1	1	2	3
BP405T	3	1	2	2	2	1	2	1	2	2	3



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Justification for Pharmacognosy & Phytochemistry-I [(Theory) (BP405P)]

PO1	As a core subject of pharmacy, all the objectives are directly associated with pharmacy knowledge hence all the CO's were mapped moderate.
PO2	Though cultivation, collection and storage of medicinal plants and evaluation of adulterants involves a sort of planning hence CO1, CO2 and CO5 was mapped low and other CO's were not mapped
PO3	Student need to have analyzing power during cultivation, identification and evaluation aspects, hence CO1 to CO4 are mapped moderate.
PO4	Herbal Drug technology, evaluation of adulterants & raw material and Plant tissue culture involve the use of modern tools hence CO1 is mapped low and CO3 & CO5 were mapped at moderate.
PO5	The knowledge of cultivation of medicinal plants and traditional system of medicine needs to be decimated in farmers and common public respectively with proper guidance hence CO2 & CO4 have been mapped moderate.
PO6	Knowledge of alternative system of medicine and plant tissue culture techniques and knowledge of traditional system of medicine would enable the students to identify themselves as educators and promoters of health in the society, hence all the CO's are mapped low.
PO7	All the components of this subject deals with the medicinal substances, it definitely involves ethical issues. Hence, all the CO's are mapped moderate to low.
PO8	Students gain the skills to communicate, comprehend and present the technical knowledge gained about herbal products to pharmacy community and society at large and hence CO2 is mapped moderate and other CO's are mapped low.
PO9	Knowledge of safety and efficacy of herbal medicines ensures better health care to the society, and also applications of medicinal plant cultivation and traditional system of medicine must be decimated to society. Hence CO2 and CO4 are mapped moderate and CO1 & CO5 are mapped low.
PO10	The cultivation, collection and storage of medicinal plants and their over exploitation involves the effect on environment, CO2 and CO5 is mapped moderate and CO3 and CO4 are mapped low.
PO11	Being core subject of Pharmacy, course needs continue up gradation of the knowledge, hence all the CO's are mapped high.

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Pharmacognosy & Phytochemistry-I [(Practical) (BP409P)]

After completion of this course student will be able to:

BP405P.1	Identify and analyse unorganized crude drugs systematically
BP405P.2	Evaluate and analyse quality of crude drugs by microscopic methods
BP405P.3	Evaluate and analyse quality of crude drugs by physico-chemical parameters

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP405T.1	3	2	3	1	1	1	2	2	1	2	3
BP405T.2	3	2	3	2	1	1	2	2	1	2	3
BP405T.3	3	2	3	2	1	1	2	2	1	2	3
BP405T	3	2	3	2	1	1	2	2	1	2	3

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Justification for Pharmacognosy & Phytochemistry-I [(Practical) (BP409P)]

PO1	The practical aspects of this course are directly associated with the quality evaluation of crude drugs. Hence all the CO's are mapped high
PO2	The students would be able to plan and carry out the identification and chemical analysis of crude drugs. Hence, both the CO's are mapped moderate.
PO3	The course is directed towards the evaluation of quality of crude drugs, the scientific enquiry and problem solving is involved, hence all the CO's are mapped high
PO4	Students acquire the basic tools needed to carry out independent microscopic evaluation and chemical analysis crude drugs. Hence CO1 is mapped low while CO2 and CO3 are mapped moderately.
PO5	The students would require to work in groups and coordinate with team members. Hence, CO1 is mapped low
PO6	Very little professional role is involved hence all the CO mapped low
PO7	Quality analysis of crude drugs involves ethical guidelines. Hence, CO1 mapped moderate.
PO8	As practical, students expected to communicate in terms of report writing, and giving viva examination hence all CO's are mapped moderate.
PO9	Quality analysis of crude drugs involves societal responsibilities to certain extent. Hence all the CO's were mapped low.
PO10	Since the course involves the sustaining use of medicinal plants, which directly affects environment all the CO's are mapped moderate.
PO11	As one of the core pharmacy subject student need to upgrade evaluation techniques hence all CO's are mapped high.

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Medicinal Chemistry II - (Theory) BP501T

After completion of this course student will be able to:

BP501T.1	Explain detail chemistry of antihistamine and antineoplastic agents.
BP501T.2	Evaluate chemistry of anti-anginal and anti-hypertensive agents.
BP501T.3	Define all basic involved in anti-arrhythmic, anticoagulant, anti-hyperlipidaemia agents and drugs used in congestive heart failure.
BP501T.4	Explain the various drugs acting on endocrine system, thyroid gland and various antidiabetic agents and local anaesthetics.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP501T.1	3	2	2	2	2	1	1	1	2	1	2
BP501T.2	3	2	2	2	2	1	1	1	2	1	2
BP501T.3	3	2	2	2	2	1	1	1	2	1	2
BP501T.4	3	2	2	2	2	1	1	1	2	1	2
BP501T	3	2	2	2	2	1	1	1	2	1	2

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Justification for Medicinal Chemistry II - (Theory) BP501T

PO1	Students will understand the basic knowledge related to the various diseases and drugs involved in the treatment of diseases. Pharmacy knowledge is very essential in the course, hence all COs are mapped high.
PO2	Students can develop and implement planning skills in the synthetic procedures of various drugs, so all COs are mapped moderate.
PO3	Students will be able to study various therapeutic uses, adverse reactions, toxicity of drugs and apply this information to synthesize a new drug molecule, so all COs mapped moderate.
PO4	The various tools & softwares can be used for drawing the structure of chemical compounds under test, so all COs mapped moderate.
PO5	Leadership quality is required while performing synthetic reactions as well as handling the softwares for drawing different structures. So all COs mapped moderate.
PO6	Students will be able to promote the importance of health, by making the society aware regarding various disease manifestation and its treatment not to a greater extent. Hence, all COs mapped low.
PO7	All the course objectives involve the study, synthesis and uses of medicinal substances used for various disease conditions involving ethical issues. Hence, all COs are mapped low.
PO8	Students should be able to defend the reasons involved in the preparation of medicinal agents and its therapeutic uses, although to a smaller extent. Hence, all COs are mapped low.
PO9	Knowledge of proper use of various medicinal drugs and judicious use of drugs to diagnose and treat disease under study ensures better healthcare to the society. Hence all COs mapped moderate.
PO10	During the synthesis of organic compounds, various gases released can pollute the environment to some extent, solvents used in organic synthesis may sometimes be non-recoverable posing a great risk to environmental hazard to lesser extent. Hence, all COs are mapped low.
PO11	The students shall require updated knowledge regarding pharmacy profession and medicinal uses of agents in different diseases throughout the life, so all COs are mapped moderate.

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Industrial Pharmacy-I [(Theory) (BP502T)]

After completion of this course student will be able to:

BP502T.1	Describe preformulation consideration and BCS Classes of drug.
BP502T.2	Discuss formulation consideration in pharmaceutical dosage forms.
BP502T.3	Formulate and package pharmaceutical dosage forms.
BP502T.4	Evaluate various quality control parameters of pharmaceutical dosage forms.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP502T.1	3	2	2	-	-	1	2	1	1	2	2
BP502T.2	3	2	2	-	-	1	-	1	1	-	2
BP502T.3	3	2	2	3	1	1	2	1	1	2	2
BP502T.4	3	2	2	3	1	1	2	1	1	-	2
BP502T	3	2	2	3	1	1	2	1	1	2	2



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Justification for Industrial Pharmacy-I [(Theory) (BP502T)]

PO1	As Industrial Pharmacy-I is the core subject of pharmaceuticals all the COs mapped to higher extent as it provides pharmacy knowledge to students.
PO2	Pre-formulation studies and formulation considerations and quality control involves planning and time management to some extent so it mapped as moderate.
PO3	Pre-formulation, formulation and quality control involve analysis of drug/excipient/formulation so mapped as moderate while
PO4	Modern tools can be used in formulation development such as DoE while quality control test involve use various data analysis software so mapped at high extent.
PO5	Formulation development and quality control analysis practical involve initiation, motivation, team building and leadership skills so mapped at lower extent
PO6	As pharmacist is a healthcare professional can communicate the value of his professional role to society to some extent so mapped as minimum.
PO7	Preformulation, Formulation development and quality control analysis are associated with ethical principles and social context so mapped as moderate.
PO8	The students sometimes may present/communicate their findings to society directly or through publications so mapped at minimum extent.
PO9	The knowledge gained in subject can sometimes be used for societal help and safety by students so mapped at lower extent.
PO10	Biodegradability of excipients in pre-formulation and packaging material in Packaging if considered will contribute environment and sustainability so mapped at moderate extent.
PO11	As the course is core subject of pharmacy, it continues up gradation of knowledge and lifelong learning it is mapped to moderate level in all COs.

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Industrial Pharmacy-I [(Practical) (BP506P)]

After completion of this course student will be able to:

BP506P.1	Understand the pre-formulation of drug and excipients
BP506P.2	Prepare and evaluate different dosage forms and cosmetics
BP506P.3	Analyse quality control of packaging material

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP506P.1	3	1	1	-	1	-	1	1	1	1	2
BP506P.2	3	1	1	2	1	1	1	1	-	-	2
BP506P.3	3	1	1	2	1	1	-	1	1	1	2
BP506P	3	1	1	2	1	1	1	1	1	1	2

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Justification for Industrial Pharmacy-I [(Practical) (BP506P)]

PO1	Students will be able to understand concept of Pre-formulation, formulation and quality control of dosage forms and packaging material which is core area in pharmacy so mapped at higher extent.
PO2	Students will develop planning abilities while performing by following sequence of procedures in Pre-formulation, formulation and quality control analysis, so mapped at lower extent.
PO3	Students will be able to develop critical and logical thinking abilities in order to solve the problems during practicals so mapped at lower extent.
PO4	Students will be able to use modern analytical tool like lab instruments, MS-Excel while performing quality control tests of dosage forms so mapped at moderate extent.
PO5	Students will learn to coordinate amongst their team members while performing practicals and could develop team building and leadership skills to some extent. Hence, mapped at lower extent.
PO6	As Pharmacy students are future health care professionals sometimes they will be able to communicate the value of their roles in the society. Hence, mapped at low levels at CO2 and CO3.
PO7	Students will be able to apply ethical principles in professional and social contexts, hence, all COs are mapped at lower extent.
PO8	Students will be able to write and present and communicate the report of their findings during practicals. Hence mapped at lower extent.
PO9	The students will be able to contribute their knowledge of drugs, excipients, packaging materials and related safety to the society hence mapped at lower extent.
PO10	Students will be able to know about biodegradability of excipients in Preformulation studies and packaging materials which may impact the environment so mapped at lower extent.
PO11	As the course is core subject of pharmacy, it continues upgradation of knowledge and lifelong learning it is mapped to moderate level in all COs.

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Pharmacology-II [Theory (BP 503 T)]

Upon completion of this course the student will be able to;

BP 503T.1	Describe the mechanism of drug action and its relevance in the treatment of different diseases.
BP 503T.2	Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
BP 503T.3	Demonstrate the various receptor actions using isolated tissue preparation.
BP 503T.4	Interpret the correlation of pharmacology with related medical sciences.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP50T.1	3	2	-	-	2	-	1	1	3	1	2
BP50T.2	2	2	1	3	-	2	1	1	2	1	2
BP50T.3	2	2	1	3	-	2	1	1	2	1	3
BP50T.4	3	-	-	-	2	-	1	1	3	1	2
BP503T	3	2	1	3	2	2	1	1	3	1	2



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Justification for Pharmacology-II (BP 503T) (Theory)

PO1	As a core subject of pharmacy, all the objectives are directly associated with pharmacy knowledge.
PO2	The students get the in-depth knowledge about pharmacology and pharmacotherapy of drugs used in infectious diseases, cardiovascular disorders etc. Hence, most of the CO's are mapped moderate.
PO3	Being a very basic course, the students are able to find and analyze the various diseases in the society and apply the knowledge of drugs and drug actions, in the prevention and treatment of diseases.
PO4	The students get to study action of drugs on various tissues, cell and animals with the use of different instruments and models, so CO's mapped moderately.
PO5	The students will understand, analyze and communicate the value of their professional roles in society.
PO6	Students will develop and implement plans for studying the actions of various drugs on animal models & how the treatment should be through the various steps for the prevention of diseases.
PO7	Students will apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions
PO8	Students acquire skills of communication, understanding and to can explore the knowledge gained about various drugs, their actions and use of drug in the treatment of disease to society at certain extent.
PO9	Thorough knowledge of various drugs and to diagnose and treat the diseases ensures better healthcare to the society. Hence most of the Cos mapped high.
PO10	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	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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Pharmacology-II [Practical (BP 507 P)]

Upon completion of this course the student should be able to

BP 507P.1.	Evaluate the physiological salt solutions, drug solutions and apply its use in various animal experiments.
BP 507P.2.	Demonstrate the unknown concentration of drugs using suitable isolated tissue preparations.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 507P.1.	3	2	1	1	2	2	1	1	1	1	2
BP 507P.2.	3	2	2	1	2	2	1	1	1	1	3
BP 507P	3	2	2	1	2	2	1	1	1	1	3

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Justification for Pharmacology-II (BP 507P) (Practical)

PO1	As a core subject of pharmacy, all the objectives are directly associated with pharmacy knowledge.
PO2	The students get the in-depth knowledge about pharmacology and pharmacotherapy of drugs by studying on animal models. Hence, the CO mapped moderate.
PO3	The students are able to find and analyze the various diseases in the society and apply the knowledge of drugs and drug actions, in the prevention and treatment of diseases.
PO4	The students get to study action of drugs on various tissues, cell and animals with the use of different instruments and models, So all the CO's mapped low.
PO5	The students will understand, analyze and communicate the value of their professional roles in society. Thus, all the CO's mapped moderately.
PO6	Students will develop and implement plans for studying the actions of various drugs on animal models & how the treatment should be through the various steps for the prevention of diseases.
PO7	Students will apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
PO8	Students gain the skills to communicate, comprehend and present the technical knowledge gained about drug products to pharmacy community and society. Thus all the CO's mapped low.
PO9	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	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	Being core subject of Pharmacy, course needs continue up gradation of the knowledge & to Self-access and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

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SAROJINI COLLEGE OF PHARMACY

R. S. No. 576, Near Rajendranagar Water Tank, Rajendranagar, Kolhapur. – 416004
E - mail – sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com

Pharmacognosy and Phytochemistry II (Theory) (BP504 T)

After completion of this course student will be able to:

BP504 T.1	Explain basic biosynthetic pathways and metabolism involved in production of secondary metabolites.
BP504 T.2	Discuss various secondary metabolites from medicinal plants.
BP504 T.3	Apply the knowledge of isolation, identification of herbal constituents and analyse them.
BP504 T.4	Explain industrial production, estimation, and utilization of therapeutically useful phytoconstituents.
BP504 T.5	Explain and demonstrate extraction methods and analysis by using modern instruments

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 504 T.1	3	--	1	1	--	1	--	2	1	2	3
BP 504 T.2	3	--	1	1	--	1	--	2	1	2	3
BP 504 T.3	3	2	2	2	1	1	2	1	1	2	3
BP 504 T.4	3	2	2	3	3	2	2	3	2	2	3
BP 504 T.5	3	1	2	3	2	2	2	2	2	2	3
BP 504 T	3	2	2	3	2	2	2	2	2	2	3



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Justification for Pharmacognosy and Phytochemistry II [(Theory) (BP504 T)]

PO1	All other CO'S are mapped high as the subject involves all the concepts related with pharmacy knowledge.
PO2	No planning abilities involves in CO1 and CO2 hence are not mapped. CO3 ,CO4 are mapped moderately as it includes identification and analysis of herbal constituents which requires sort of planning and delegation skills. CO5 is mapped less as it deals with understanding of theoretical concept related with extraction methods.
PO3	CO3, CO4, CO5 are mapped moderately as isolation, analysis of secondary metabolites requires analytical thinking, problem solving ability and systematically application of theoretical concept for extraction of the secondary metabolites. CO1, CO2 are mapped less.
PO4	CO1 ,CO2 are mapped less because they do not involves utilization of any modern tools. CO3 is mapped moderately as it is related with analysis of the metabolites which includes utilization of various tools. CO4 and CO5 are mapped extremely because they are related with industrial production of plant metabolites and extraction methods which includes utilization of various modern tools.
PO5	CO1, CO2 are not mapped as it not involves any leadership skills.CO4 is mapped extremely as it involves leadership role.
PO6	CO1, CO2, CO3 are mapped less as it involves very less professional role. CO4, CO5 are mapped moderately because knowledge of extraction methods, use of plant secondary metabolites would help the students to identify themselves as educators and promoters of health in the society.
PO7	CO1, CO2 are not mapped because it does not involve any professional ethics.CO3, CO4, CO5 are mapped moderately because all are associated with ethical issues as it deals with applications and production of the secondary metabolites.
PO8	Students gain the skills to communicate, comprehend and present the technical knowledge gained about herbal products to pharmacy community society hence CO1, CO2, CO5 are mapped moderately. CO 4 is mapped highest because by knowing the application of secondary metabolites students communicate effectively with society.
PO9	CO4 and CO 5 are mapped more as the knowledge about secondary metabolites and its application helps to access the health and safety issues. CO1, CO2, CO3 are mapped less as contextual knowledge is not useful to access legal issues.
PO10	The course content is deals with the extraction of secondary metabolites from plants and utilization of therapeutically active phytoconstituents which involves societal and environmental context hence all CO'S mapped moderately.
PO11	The whole course requires lifelong learning as all the components will be updated on regular basis hence all Cos are mapped high.

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Pharmacognosy and Phytochemistry II (Practical) (BP 508 P)

After completion of this course student will be able to:

BP 508 P.1	Analyse raw materials using physical and chemical methods of analysis.
BP 508 P.2	Demonstrate methods for isolation and detection of phytoconstituents.
BP 508 P.3	Analyse phytoconstituents by using simple chromatographic techniques.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 508 P.1	3	3	2	2	2	1	2	2	2	2	3
BP 508 P.2	3	3	2	3	2	1	2	2	2	2	3
BP 508 P.3	3	3	2	3	2	1	2	2	2	2	3
BP 508 P	3	3	2	3	2	1	2	2	2	2	3

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Justification for Pharmacognosy and Phytochemistry II [(Practical) (BP 508P)]

PO1	All CO'S are mapped high as course content is related with the evaluation of crude drugs.
PO2	All CO'S are mapped extremely because students would be able to plan and carry out the physical and chemical analysis of crude drugs.
PO3	Students would be able to evaluate quality of the crude drugs through analysis. It also includes problem solving skill, analytical thinking, and application of knowledge for decision making. Hence all PO'S are mapped moderately.
PO4	CO1 is mapped less as it is related to analysis of crude drugs by chemical methods and hence do not involve utilization of modern tools. CO2, CO3 are mapped extremely because we can use modern methods or tools for isolation and detection of the phytoconstituents.
PO5	All CO'S are mapped moderately because it involves team work.
PO6	All CO'S are mapped less because little professional role is involved.
PO7	Quality analysis involves the ethical guidelines, so all CO'S are mapped moderately.
PO8	Students would be able to communicate in terms of report writing after study of course content hence all CO'S are mapped moderately.
PO9	All CO'S are mapped moderately because analysis of crude drug for its quality involves social and health issues.
PO10	Practical content includes the plant raw material analysis, extraction of active principles from it which is related with environmental context so all CO'S are mapped moderately.
PO11	All CO'S are mapped extremely because students need to upgrade the method/s of analysis of crude drugs or isolation tools for phytoconstituents.

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Pharmaceutical Jurisprudence (Theory) BP505T

After completion of this course student will be able to:

BP505T.1	Explain pharmaceutical legislations and acts in India, practice of Professional Ethics.
BP505T.2	Apply Rules and Regulations regarding educations regulations, Manufacture and Sale of drugs and application of new drugs with clinical trial study.
BP505T.3	Implement the Rules and Regulations regarding Medicinal and Toilet Preparations Act & Narcotic and Psychotropic Substances Act
BP505T.4	Summarize provisions on Drugs and Magic Remedies Act, DPCO, New Pharmaceutical policy Act & Guidelines towards Animals Act.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP505T.1	3	-	1	-	1	2	3	-	3	-	3
BP505T.2	3	1	1	-	2	-	3	2	3	-	3
BP505T.3	3	1	1	-	2	2	3	2	3	-	3
BP505T.4	3	1	1	-	2	2	3	1	3	-	3
BP505T	3	1	1	-	2	2	3	2	3	-	3



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Pharmaceutical Jurisprudence (Theory) BP505T

PO1	Students acquire the basic knowledge of ethics, Acts, rules and regulations. Hence, COs mapped high.
PO2	Students would be able to implement and follow ethics effectively to learn lifelong. Hence, COs marked low.
PO3	Students able to solve problem by studying rules and regulations. So all COs mapped low.
PO4	Not much of use of tools required. Hence no mapping
PO5	Students understand and communicate the values of profession ethics, rules regulations regarding medicinal and toilet preparations and Narcotics and psychotropic act and rules. Hence, COs marked moderately.
PO6	Students follow and implement the knowledge of ethics rules and new guidelines. Hence, COs mapped moderate.
PO7	Students acquire the knowledge about manufacturing and sales of drugs, implementation of rules and regulations along with special reference to main provisions on drugs and magic remedies act, DPOC act and the guidelines towards animal's act. Hence, all COs mapped high.
PO8	Students will be able to communicate the various rules and regulations pertaining to their profession with the stake holders and the community. So, COs mapped moderate.
PO9	Students will be able to apply their knowledge of pharmaceutical legislations for public awareness. Hence, all COs are mapped high.
PO10	No issues on environment and sustainability. Hence. no mapping
PO11	The student shall keep himself updated which requires lifelong learning. Hence, COs mapped high.

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Medicinal Chemistry – III (Theory) (BP601T)

After completion of this course student will be able to:

BP601T.1	Remember structures, MOAs and uses of antibiotics.
BP601T.2	Correlate the relationship between the structure and biological activity of drug molecules
BP601T.3	Explain the concept of prodrugs and various approaches used in drug design.
BP601T.4	Outline the synthesis of antifungal, antiprotozoal and antiviral agents.
BP601T.5	Explain the chemistry of sulphonamides & sulfones w.r.t. their biological activity.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP601T.1	3	1	1	1	1	1	1	1	1	2	3
BP601T.2	3	2	1	1	1	1	1	1	1	2	3
BP601T.3	3	3	2	3	1	2	1	2	1	2	3
BP601T.4	3	1	1	1	1	1	1	2	1	2	3
BP601T.5	3	1	1	3	1	2	1	1	1	2	3
BP601T	3	2	1	2	1	1	1	1	1	2	3



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Justification for Medicinal Chemistry – III (Theory) (BP601T)

PO1	Pharmacy knowledge will serve as a strong basis in synthesis, spectrum of activity, mechanism of action and SAR studies of different medicinal agents. Hence, all COs are mapped high.
PO2	Drug design and prodrug concept is a time-bound evaluation & more concise to abilities in planning. Hence, CO3 is mapped high and rest are mapped low to moderate.
PO3	Concepts in traditional synthesis, metabolism, drug design & prodrugs are helpful in problem analysis and designing new molecules under synthesis. Hence, CO3 is mapped moderate and rest COs are mapped low.
PO4	Drug design is a software based procedure and its pharmacological parameters are evaluated on the software tool itself. Hence, CO3 & CO5 are mapped high and rest COs are mapped low since small tools are utilised.
PO5	Synthetic methods require good leadership qualities during the practical procedures may be to a lesser extent. Hence, all COs are mapped low.
PO6	Utilization of concepts of prodrugs & drug designing may help in building a strong healthcare professional that enables new drug synthesis. Hence, CO3 & CO5 are mapped moderate and rest COs are mapped low.
PO7	Scientists demonstrate perspectives that recognise good professional ethics and etiquettes towards pharma culture, since the course consists of synthesis of medicinal agents for formulation purpose. However, all COs are mapped low since the cause lead to lesser extent.
PO8	Good communication is required to defend the viva-voce on the principle and procedure involved in the synthesis of pharmaceutical or medicinal agent. Hence, all COs are mapped low to moderate.
PO9	Pharmacist initiate a good healthcare service to society and build a strong bond of trust and compassion to associate better patient compliance and better posological studies. But, all COs are mapped low since the cause is quantitative to a considerable extent only.
PO10	Synthesis of drugs & its application in chemistry has to be monitored by green approach at maximum level, considering environmental factors. Hence, all COs are mapped moderate.
PO11	Students shall get knowledge about prescribed medicinal agents for continuous education and advance chemistry technology can only be grasped with drug design and QSAR studies. Hence all COs are mapped high.

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Medicinal Chemistry – III (Practical) (BP607P)

After completion of this course student will be able to:

BP607P.1	Explain the principle and reactions involved in the synthesis of medicinal agents.
BP607P.2	Synthesize medicinal compounds and calculate percentage yield.
BP607P.3	Standardize reagents and perform assay of marketed formulations.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP607P.1	3	2	2	2	1	2	1	2	2	2	3
BP607P.2	3	2	1	2	2	1	1	2	2	3	3
BP607P.3	3	2	1	1	1	1	2	2	1	2	3
BP607P	3	2	1	2	1	1	1	2	2	2	3

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Justification for Medicinal Chemistry – III (Practical) (BP607P)

PO1	Pharmacy knowledge is greatly exploited to design the principle, reaction mechanism and synthetic approach in the synthesis of different medicinal agents. Hence, all COs are mapped high.
PO2	Drug synthesis as well as traditional method of purity analysis or assay of marketed formulation, is a trained and systematic planning of the time invested. Hence, all COs are mapped moderate.
PO3	Synthesis of medicinal agents and drug-assay procedures are based upon problem solving scenario. Hence, CO1 is mapped high and CO2 & CO3 are mapped moderate.
PO4	Traditional methods replaced by modern synthetic approaches, involve use of modern tools and equipment. Hence, all CO1 & CO2 are mapped moderate and CO3 is mapped low.
PO5	Practical involving synthesis of drugs require good leadership skills, may be not to a great extent. Hence, all CO1 & CO3 are mapped low and CO2 is mapped moderate.
PO6	Modern synthesis and different reaction alternatives due to changing science may contribute to good and healthy professional identity. Hence, CO1 is mapped moderate and CO2 & CO3 are mapped low.
PO7	Synthesis of safe and efficacious medicinal agents enable portray of good professional ethics to better living of patients. Hence, CO1 & CO2 are mapped low and CO3 is mapped high.
PO8	Good communication is required to defend the viva-voce on the principle and procedure involved in the synthesis of pharmaceutical or medicinal agent. Hence, all COs are mapped moderate.
PO9	Synthesis of medicinal agents, its purification and quantitative analytical assay acclaims good interlink between the pharma sector and society. Hence, CO1 & CO2 are mapped moderate and CO3 is mapped low.
PO10	Synthesis of drugs involves good consumption of renewable as well as non-renewable resources including quantities of solvents, raw materials etc. Hence, CO1 & CO3 are mapped moderate whereas, CO2 is mapped high.
PO11	Synthetic procedures needs up-gradation from time-to-time since chemistry is a day-by-day changing subject. Hence, all COs are mapped high.

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Pharmacology-III [(Theory) (BP 602T)]

Upon completion of this course the student will be able to;

BP 602T.1	Interpret correlation of pharmacology with medical sciences of respiratory and GIT system.
BP 602T.2	Comprehend various principles of toxicology as well as Chrono pharmacology.
BP 602T.3	Categorize immunopharmacology as immunostimulant and immunosuppressant.
BP 602T.4	Explain the chemotherapy of antibiotics
BP 602T.5	Describe the mechanism of drug action and its relevance in the treatment of different infectious diseases.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 602T.1	3	2	1	1	1	1	3	1	2	1	3
BP 602T.2	3	2	1	1	1	1	3	1	2	1	3
BP 602T.3	3	-	1	1	1	1	3	1	2	1	3
BP 602T.4	3	-	1	1	1	1	3	1	2	1	3
BP 602T.5	3	-	1	1	1	1	3	1	2	1	3
BP 602T	3	-	1	1	1	1	3	1	2	1	3



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Justification for Pharmacology-III [(Theory) (BP 602T)]

PO1	As a core subject of pharmacy, all the objectives are directly associated with pharmacy knowledge. Hence, the CO mapped high.
PO2	The students will demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills.
PO3	Being a very basic course, the students are able to find and analyze the various diseases in the society and apply the knowledge of drugs and drug actions, in the prevention and treatment of diseases.
PO4	The students get to study action of drugs on various tissues, cell and animals with the use of different instruments and models.
PO5	The students will 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.
PO6	Students will understand, analyse and communicate the value of their professional roles in society as health care professionals, promoters of health, etc.
PO7	Students will use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
PO8	Students acquire skills of communication, understanding and to can explore the knowledge gained about various drugs, their actions and use of drug in the treatment of disease to society at certain extent.
PO9	Thorough knowledge of various drugs and to diagnose and treat the diseases ensures better healthcare to the society. Hence all Cos mapped moderately.
PO10	The students will understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	Being core subject of Pharmacy, course needs continue up gradation of the knowledge & to self-access and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis., so all CO's mapped high.

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Pharmacology-III [(Practical) (BP 608 P)]

Upon completion of the course, the student will be able to;

BP 608P.1	Calculate the dose of different drugs in different pharmacological experiments.
BP 608P.2	Demonstrate the unknown concentration of drugs using suitable isolated tissue preparations.
BP 608P.3	Calculate the pharmacokinetic parameters from any different drugs & to know the biostatistics method for research methodology.

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 608P.1.	2	2	2	2	2	3	1	1	1	1	3
BP 608P.2.	2	2	2	2	2	3	1	1	1	1	3
BP 608P.3.	2	2	2	2	2	3	1	1	1	1	3
BP 608P	2	2	2	2	2	3	1	1	1	1	3

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Justification for Pharmacology-III (BP 608P) (Practical)

PO1	As a core subject of pharmacy, all the objectives are directly associated with pharmacy knowledge.
PO2	The students get the in-depth knowledge about pharmacology and pharmacotherapy of drugs by studying on animal models. Hence, the CO mapped moderate.
PO3	The students are able to find and analyze the various diseases in the society and apply the knowledge of drugs and drug actions, in the prevention and treatment of diseases.
PO4	The students get to study action of drugs on various tissues, cell and animals with the use of different instruments and models, So all the CO's mapped moderately.
PO5	The students will understand, analyze and communicate the value of their professional roles in society. Thus, all the CO's mapped moderately.
PO6	Students will develop and implement plans for studying the actions of various drugs on animal models & how the treatment should be through the various steps for the prevention of diseases.
PO7	Students will apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
PO8	Students gain the skills to communicate, comprehend and present the technical knowledge gained about drug products to pharmacy community and society. Thus all the CO's mapped low.
PO9	Thorough knowledge of various drugs and to diagnose and treat the diseases ensures better healthcare to the society. Hence all CO's mapped low.
PO10	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	Being core subject of Pharmacy, course needs continue up gradation of the knowledge & to Self-access and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

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Herbal Drug Technology (Theory) (BP 603 T)

After completion of this course student will be able to:

BP 603 T.1	Incorporate the knowledge of herbal raw material through good agricultural practice into herbal products.
BP 603 T.2	Apply the knowledge of nutraceutical agents in various metabolic disorders and explain herb-drug and herb- food interaction.
BP 603 T.3	Develop various herbal formulations and analyse them.
BP 603 T.4	Analyse herbal raw material as per statutory guidelines and understand the regulatory requirements associated with natural products.
BP 603 T.5	Implement relevant GMP in the working of herbal drug industry.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 603 T.1	2	1	2	2	2	2	2	2	2	2	2
BP 603 T.2	3	2	2	1	1	2	3	2	2	2	3
BP 603 T.3	3	2	3	3	3	2	3	2	2	2	3
BP 603 T.4	3	1	2	1	1	2	3	2	2	2	3
BP 603 T.5	3	3	3	3	3	2	3	2	2	2	3
BP 603 T	3	2	3	2	2	2	3	2	2	2	3



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Justification for Herbal Drug Technology [(Theory) (BP 603 T)]

PO1	All COS 1 are directly associated with the pharmacy knowledge hence mapped highest except CO1 as it is deals with the GAP of herbal raw material.
PO2	CO2.CO3, CO5 are mapped moderately as it deals with applications of nutraceuticals, herbal formulations and GMP which requires sort of planning while CO1 ,CO4 mapped less.
PO3	CO3, CO5 requires analytical thinking decision making abilities throughout the formulation procedure or using the GMP so mapped highest.
PO4	Preparation of Herbal formulations requires analysis of various raw material using moder tools as well as knowledge and utilization of modern methods must be clear during working in herbal industry hence CO3, CO5 mapped higest.CO2, CO4 mapped less as it deals with applications of nutraceuticals and regulatory guidelines which does not involves utilization of any computing tools.
PO5	CO3, CO5 mapped highest as it involves team building ability or leadership role throughout the working procedure while CO2, CO4 mapped less.
PO6	All CO'S mapped moderately as it includes knowledge of herbal raw materials, nutraceuticals and their applications helps the students to identify themselves as a educators or promoters of health in society.
PO7	All the components involve type of herbal medicines and their applications which must involves ethical issues. Hence all CO'S are mapped moderately except CO1 which is mapped less.
PO8	All CO'S mapped moderately as after competition of the syllabus students will gain the depth knowledge about herbal raw material, their formulations, and applications hence they will communicate effectively with society.
PO9	Conceptual knowledge will ensure better healthcare to the society. Hence all CO'S are mapped moderately.
PO10	Knowledge about herbs, herbal formulations, their applications and working of herbal drug industry involves societal and environmental context hence all CO'S mapped moderately.
PO11	Except CO1, all CO'S are mapped moderately as course needs continue upgradation of the knowledge.

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E - mail – sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com

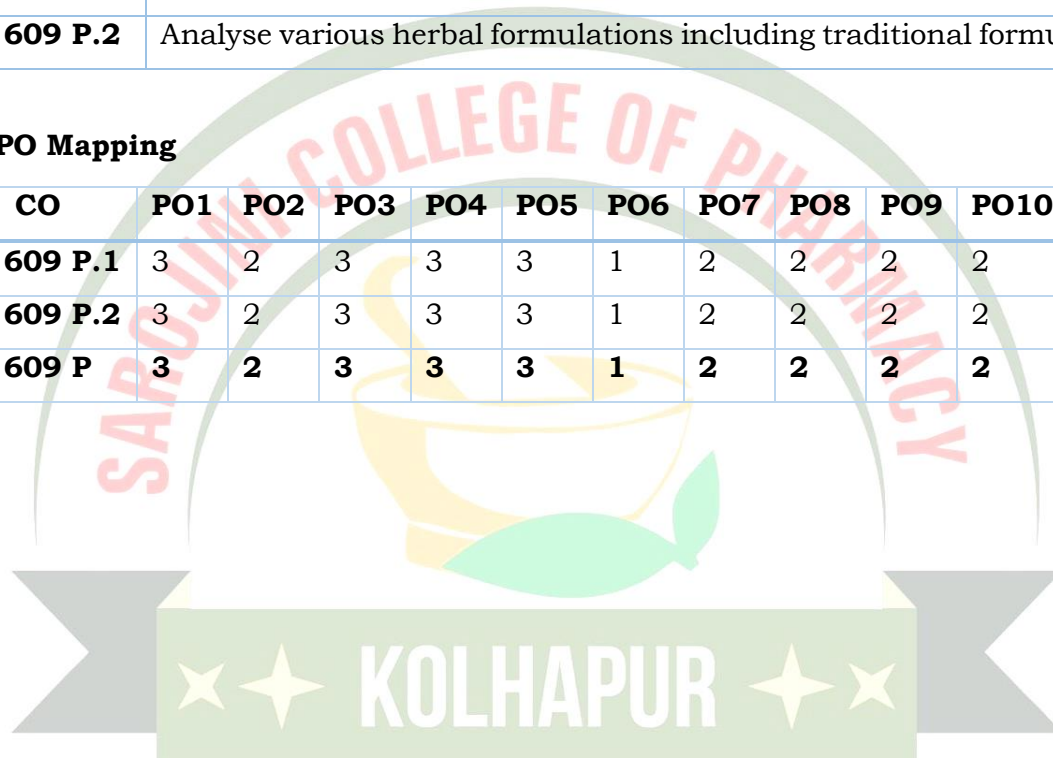
Herbal Drug Technology (Practical) (BP 609 P)

After completion of this course student will be able to:

BP 609 P.1	Evaluate various crude drugs for presence of secondary metabolites.
BP 609 P.2	Analyse various herbal formulations including traditional formulations.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP 609 P.1	3	2	3	3	3	1	2	2	2	2	2
BP 609 P.2	3	2	3	3	3	1	2	2	2	2	2
BP 609 P	3	2	3	3	3	1	2	2	2	2	2





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Justification for Herbal Drug Technology [(Practical) (BP 609 P)]

PO1	All CO'S are mapped high as all practical aspects are associated with knowledge associate with profession of pharmacy.
PO2	Students would be able to plan and carry out evaluation of secondary metabolites and herbal formulations by means of physical and chemical methods. Hence all CO'S are mapped moderately.
PO3	All CO'S are mapped high because all practical content deals with evaluation of herbal raw material and formulations for its quality criteria which includes scientific enquiry, problem solving and includes application of known information scientifically.
PO4	Students acquire the theoretical as well as practical knowledge about the tools used for evaluation of herbal raw material, secondary metabolites, and herbal formulations, hence all CO'S mapped highest.
PO5	Students would require to work in group and need to coordinate with team members which leads to building leadership quality among students. Hence all CO'S are mapped extremely.
PO6	All CO'S are mapped low because involvement of professional role is less.
PO7	Evaluation of raw material and finished herbal formulation involves ethical guidelines. Hence all CO'S are mapped moderately.
PO8	After completion of practical/s students would be able to comprehend and write effective reports, hence all CO'S are mapped moderately.
PO9	As conceptual knowledge along with practical knowledge would help to asses social or health issues hence all CO'S are mapped moderately.
PO10	Since all practical aspects related with herbs hence related with environment context, so all CO'S are mapped moderately.
PO11	All CO'S are mapped moderately as subject need to upgrade evaluation techniques.

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Biopharmaceutics and Pharmacokinetics [(Theory) (BP604T)]

After completion of this course student will be able to:

BP604T.1	Describe basic concepts in biopharmaceutics and pharmacokinetics.
BP604T.2	Analyse bioavailability and bioequivalence.
BP604T.3	Explain pharmacokinetic models.
BP604T.4	Demonstrate nonlinear pharmacokinetics.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP604T.1	3	2	-	-	-	1	1	-	1	-	2
BP604T.2	3	2	2	3	-	1	1	2	1	-	2
BP604T.3	3	2	2	3	-	1	1	2	1	-	2
BP604T.4	3	2	2	3	-	1	1	-	1	-	2
BP604T	3	2	2	3	-	1	1	2	1	-	2

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Justification for Biopharmaceutics and Pharmacokinetics [(Theory) (BP604T)]

PO1	As Biopharmaceutics is the core subject of pharmaceuticals all the COs mapped to higher extent as it provides pharmacy knowledge to students.
PO2	Few concept in pharmacokinetics, bioavailability, bioequivalence, pharmacokinetic models and nonlinear pharmacokinetics are time dependent that demonstrate effective planning and organized work so mapped at moderate extent.
PO3	Few concepts in bioavailability, bioequivalence, pharmacokinetic models and nonlinear pharmacokinetics utilizes the principals of scientific enquiry used in making decisions during daily practice.
PO4	The complex data obtained from bioequivalence studies, dissolution studies, pharmacokinetic models and nonlinear pharmacokinetics can be simplified by using modern tools.
PO5	This subject does not impart any leadership skills so not mapped.
PO6	As pharmacist is a healthcare professional can communicate the value of his professional role to society to some extent so mapped as minimum.
PO7	This subject involves pharmacokinetics and associated to clinical studies and animal experimentations to some extent so mapped at low levels.
PO8	The findings obtained from bioavailability, bioequivalence studies can be communicated to the society for societal benefit so mapped at moderate extent while finding obtained from pharmacokinetics and nonlinear pharmacokinetics studies can be communicated through publications.
PO9	The knowledge gained in subject can used for societal help and safety so mapped at lower extent.
PO10	This subject does not impart environment sustainability in any sense so not mapped.
PO11	As the course is core subject of pharmacy, it continues up gradation of knowledge and lifelong learning it is mapped to medium level in all COs.

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Pharmaceutical Biotechnology (Theory) BP605T

After completion of this course student will be able to:

BP605T.1	Explain the importance of Immobilized enzymes in Pharmaceutical Industries
BP605T.2	Elaborate the applications of genetic engineering in relation to production of pharmaceuticals
BP605T.3	Comment on the importance of Monoclonal antibodies in Industries
BP605T.4	Appreciate the use of microorganisms in fermentation technology

CO-PO Mapping

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP605T.1	3	2	1	2	-	2	2	1	-	1	2
BP605T.2	3	2	1	2	-	2	2	1	2	1	2
BP605T.3	3	2	1	2	-	2	2	1	-	1	2
BP605T.4	3	2	1	2	-	3	2	1	2	1	2
BP605T	3	2	1	2	-	2	2	1	2	1	2



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Pharmaceutical Biotechnology (Theory) BP605T

PO1	All COs give basic knowledge about pharmacy regarding genetic engineering, fermentation technology, production of enzymes. So, all COs mapped high.
PO2	Few concept in genetic engineering, monoclonal antibodies fermentation technology demonstrate effective planning and organized work so mapped at moderate extent.
PO3	Few concept in genetic engineering, monoclonal antibodies fermentation technology utilizes the principals of scientific enquiry used in making decisions during daily practice. Hence all COs are mapped low.
PO4	The computer skills i.e., various softwares are required for genetic engineering process, immobilization process. Hence all COs mapped moderate.
PO5	This subject does not impart any leadership skills so not mapped.
PO6	Students follow and implement the knowledge of enzyme, genetic therapy & fermentation technology. Hence, CO4 mapped high and other COs moderately.
PO7	Students follow and implement the knowledge of enzyme, genetic therapy & fermentation technology and can be communicated to the society for societal benefit. Hence all the COs are mapped moderately.
PO8	The knowledge gained in subject can used for social help and safety so mapped at lower extent.
PO9	Students will be able to apply their knowledge of genetic engineering & microorganisms used for fermentation technology in society. Hence, CO2 & CO4 are mapped moderate.
PO10	Concepts like Genetic engineering, monoclonal antibodies fermentation technology impart environment sustainability to some extent. Hence all the COs are mapped low.
PO11	The student shall keep himself updated which requires lifelong learning. Hence, CO2 and CO4 are mapped moderate, while CO1 and CO3 are mapped low.

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Pharmaceutical Quality Assurance [(Theory) (BP606T)]

After completion of this course student will be able to:

BP606T.1	Explain the cGMP aspects in a pharmaceutical industry.
BP606T.2	Appreciate the importance of documentation.
BP606T.3	Elaborate the scope of quality certifications applicable to pharmaceutical industries.
BP606T.4	Illustrate the responsibilities of QA & QC departments.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP606T.1	3	2	2	2	1	3	2	1	1	3	2
BP606T.2	3	2	2	2	1	2	2	1	1	2	2
BP606T.3	3	2	2	2	2	2	2	1	1	2	2
BP606T.4	3	2	2	2	1	3	2	1	1	3	2
BP606T	3	2	2	2	1	2	2	1	1	2	2

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Justification for Pharmaceutical Quality Assurance [(Theory) (BP606T)]

PO1	The course is widely based on deep pharmacy knowledge. Hence, all COs are mapped high.
PO2	Quality Assurance Techniques involve good time management, resource management and organizational skills involving a sort of discrete planning patterns. Hence, all COs are mapped moderate.
PO3	The course emphasises on problem analysis of QA and QC department, Hence, all COs are mapped moderate.
PO4	QAT practical approaches are based on usage of sophisticated and modern tools and equipments. Hence, all COs are mapped moderate.
PO5	Great leadership qualities and skills are essential for quality analysis of methods under trial. Hence, CO3 is mapped moderate and rest all COs are mapped low.
PO6	Knowledge of cGMP, documentation, ISO9000 certification develops a great professional identity of the analyst. Hence, CO1 & CO4 are mapped high and CO2 & CO3 are mapped moderate.
PO7	The course content deals with many ethical proceedings under GMP control to considerable extent. Hence, all COs are mapped moderate.
PO8	Students should be able to defend questionnaire on quality assurance and quality control parameters of APIs or drugs under study. This task could be treated at negotiable extent, hence all COs are mapped low.
PO9	QAT course involves study of safety and efficacy in pharmaceutical agents, thereby contributing to the healthcare of the society, may be to a smaller extent. Hence, all COs are mapped low.
PO10	Quality assurance deals with safe handling of non-biodegradable effluents from the pharmaceutical industries thereby associating to the environmental factor. Hence, CO1 & CO4 are mapped high and CO2 & CO3 are mapped moderate.
PO11	QAT is industry-oriented practical course which needs continuous up-gradation and follow-up of knowledge as well as recent trends and skills involved in analytical field. Hence, all COs are mapped moderate.

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Instrumental Methods of Analysis (Theory) (BP701T)]

After completion of this course student will be able to:

BP701T.1	Explain theoretical principles of UV & IR spectroscopy.
BP701T.2	Analyze the instrumentation of UV, IR, Fluorimeter, AAS and flame photometer.
BP701T.3	Interpret principle of chromatographic separation by TLC, column & paper chromatography.
BP701T.4	Explain instrumentation of HPLC, GC & ion-exchange chromatography.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP701T.1	3	2	2	3	1	2	2	1	2	1	3
BP701T.2	3	2	2	3	1	2	1	2	1	1	3
BP701T.3	3	2	2	3	1	2	2	1	1	3	3
BP701T.4	3	2	2	3	1	2	3	1	2	2	3
BP701T	3	2	2	3	1	2	2	1	2	2	3



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Justification for Instrumental Methods of Analysis (Theory) (BP701T)]

PO1	Extensive pharmacy knowledge is involved in operating instrumental techniques. Hence, all COs are mapped high.
PO2	Good planning skills are essential and mandatory in instrumental methods of analysis, chromatographic separation process needs good planning of work. Hence, all COs are mapped moderate.
PO3	Analytical methods are meant for problem analysis & identification of quality, % strength and purity of standard substances. Hence, all COs are mapped moderate.
PO4	All instrumental methods by its terminology are based on sophisticated modern tools and numerous equipment. Hence, all COs are mapped high.
PO5	Instrumental techniques are related more to exploring great leadership skills during experimentation at certain level. Hence, all COs are mapped low.
PO6	The course develops a good professional identity amongst the analysts. Hence, all COs are mapped moderate.
PO7	The course follows pharmaceutical ethics since it declares purity and assurance of pharmaceutical drugs. Hence, CO1 & CO3 are mapped moderate, CO2 is mapped low but CO3 is mapped high.
PO8	The course involves defence of analytical results by good communication voce. Hence, CO1, CO3 & CO4 are mapped low while CO2 is mapped moderate.
PO9	The instrumental science for analytical method development & validation is based on legal proceedings to precise and accomplish limit of quantification of APIs as per specification. Hence, CO1 & CO4 are mapped moderate and CO2 & CO3 are mapped low.
PO10	Chromatographic separation involves heavy consumption of organic solvents which may not be even recoverable sometimes; hence pose a risk of environmental concern. So, CO1 & CO2 are mapped low, CO3 is mapped high and CO4 is mapped moderate.
PO11	Instrumental methods of analysis is a basis for future analytical processes & techniques. It will help real-time analysis of pharmaceuticals from identification to estimation of purity & % strength. Hence, all COs are mapped high.

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Instrumental Methods of Analysis (Practical) (BP705P)]

After completion of this course student will be able to:

BP705P.1	Explain principle & working of UV & IR spectrophotometer.
BP705P.2	Enumerate quenching of fluorescence.
BP705P.3	Determine degree of chloride and sulphate content in random sample by nepheloturbidometry.
BP705P.4	Identify selection and peak calculation of retention area & retention time by HPLC analysis.
BP705P.5	Demonstrate head space technique of sample collection in Gas chromatography.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP705P.1	3	2	2	3	1	1	1	2	1	2	3
BP705P.2	3	1	1	3	1	1	1	2	1	1	3
BP705P.3	3	1	3	3	1	1	2	2	1	2	3
BP705P.4	3	3	3	3	2	1	2	2	1	3	3
BP705P.5	3	3	2	3	2	1	1	2	1	2	3
BP705P	3	2	2	3	1	1	1	2	1	2	3



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Justification for Instrumental Methods of Analysis (Practical) (BP705P)]

PO1	All practicals on modern analytical instruments require deep pharmacy knowledge about the principle involved, calibration & preparation and handling of equipment. Hence, all COs are mapped high.
PO2	Analytical procedures on sensitive instruments usually require good planning, time management and much of pre-workout scenes. Hence, CO4 & CO5 are mapped high, while rest are mapped low or moderate.
PO3	All analytical work is done to analyse problems in pharmaceutical composition either to estimate purity &/or % strength or detect any spurious adulterants/contaminants. Hence, CO3 & CO4 are mapped high, rest COs are mapped low.
PO4	All modern analytical methods are performed on sophisticated & highly sensitive instruments. Considering high modern tool usage, all COs are mapped high.
PO5	Experimentation on HPLC & GC needs great decision making capacity and leadership skills amongst the analyst. Therefore, CO4 & CO5 are mapped moderate.
PO6	Analysis on HPLC, UV, IR, GC, LC-MS helps an analyst to develop good professional identity and confidence as healthcare service. Also, instrumental analysis contribute to good social cause and healthcare to some considerable extent. So, CO1, CO4 & CO5 are mapped low.
PO7	Analytical data is ethical and liable to a responsibility of individual being not to violate pharmaceutical code of ethics in data representation. Hence, COs are mapped from low to moderate.
PO8	The practical course involves defence of analytical results by good communication voce. Hence, all COs are mapped moderate.
PO9	The practical course is based on legal proceedings to identify, detect and analyse purity of substance. Hence, all COs are mapped low.
PO10	Determination of chloride and sulphate content in potable water sample is a great environmental concern. Hence, CO3 is mapped high and rest COs are mapped low to moderate.
PO11	Analytical techniques serves great future in pharmaceutical sciences and needs life-long learning and enrichment to re-establish underdeveloped or non-identified methods of analysis. Hence, all COs are mapped high.

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Industrial Pharmacy-II (Theory) BP702T

After completion of this course student will be able to:

BP702T.1	Explain of the process of pilot plant and scale up of pharmaceutical dosage forms
BP702T.2	Explain the process of technology transfer from lab scale to commercial batch
BP702T.3	Define Laws and Acts that regulate pharmaceutical industry
BP702T.4	Express the approval process and regulatory requirements for drug products

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP101T.1	2	2	2	2	-	-	-	-	1	-	-
BP101T.2	3	3	3	3	-	-	1	2	1	-	2
BP101T.3	2	2	2	-	2	2	2	2	2	1	1
BP101T.4	2	-	-	2	2	2	2	2	2	1	2
BP101T	2	2	2	2	2	2	2	2	2	1	2

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Justification for Industrial Pharmacy-II (Theory) BP702T

PO1	All CO's are mapped low, as the information here is basic for the student to gain elementary pharmacy knowledge.
PO2	CO's are mapped low as students would be able to plan and demonstrate the properties of ingredients and other constituents in development of a proper dosage form.
PO3	Students will be able to think from critical analysis point of view and solve complex problems. Hence, CO1 and CO4 are mapped low.
PO4	Methods generated for students to know and understand evaluation and testing of different dosage forms. Hence, CO2, CO3, CO4 mapped moderately.
PO5	Students will understand co-working and co-operation, which in turn will help them understand team building. Hence, CO2 and CO3 are mapped low.
PO6	The theoretical aspects and practical work done will be creating a professional mindset in the students and take their work responsibly. Hence, no mapping is observed here.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, CO1, CO2 are mapped low.
PO8	Students will develop good communication skills will be able to write effectively reports and make presentations. Hence, all CO's are mapped low.
PO9	No societal and social considerations and other obligations come across the students' career. Hence, no mapping.
PO10	No curriculum content is related to the environment and sustainability. Hence, no mapping
PO11	Lifelong learning is a feature of professional pharmacist. Hence, all CO's are mapped moderately.

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Pharmacy Practice [(Theory) (BP703T)]

After completion of this course student will be able to:

BP703T.1	Implement various drug distribution methods in a hospital
BP703T.2	Explain the pharmacy stores management and inventory control
BP703T.3	Predict drug therapy of patient through medication chart review and clinical review
BP703T.4	Plan medication history interview and counsel the patients.
BP703T.5	Incorporate drug related problems and detect and assess adverse drug reactions

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP703T.1	3	3	3	1	-	2	3	3	2	1	2
BP703T.2	3	2	2	1	-	2	3	2	2	1	2
BP703T.3	3	3	2	1	-	2	3	2	1	2	2
BP703T.4	2	3	2	1	-	2	3	2	2	1	2
BP703T.5	3	3	2	1	-	2	3	2	2	1	2
BP703T	3	3	2	1	-	2	3	2	2	1	2



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Justification for Pharmacy Practice [(Theory) (BP703T)]

PO1	The curriculum provides the knowledge of drug distribution. Hence, all CO's are mapped highly and moderately.
PO2	The Curriculum provides planning abilities and management of drug store and inventory control. Hence, all CO's are mapped highly and moderately.
PO3	Students will be able to think analytically and solve the problems related to various methods of drug therapy. Hence, CO's mapped highly and moderately.
PO4	The course deals with various applications and online filling, use of software for drug store management. Hence mapped CO's mildly.
PO5	The course is irrelevant with the PO's. Hence, CO's are not mapped.
PO6	The curriculum would be the foundation for further professional identity in itself. Hence CO's are mapped highly and moderately.
PO7	Students will be able to apply ethical legislations in professional and social contexts while managing drug store. Hence, CO's are mapped highly and moderately.
PO8	Students will develop good communication skills and awareness to patients by patients counselling. Hence, all CO's are mapped moderately.
PO9	The contents of the syllabus obligate towards societal consideration. Hence, mapped CO's moderately and mildly.
PO10	The curriculum content affects to the social environment, health and sustainability. Hence, mapping is done mildly.
PO11	The students shall keep themselves updated, which requires lifelong learning. Hence, all CO's are mapped moderately.

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Novel Drug Delivery Systems [(Theory) (BP704T)]

After completion of this course student will be able to:

BP704T.1	Describe controlled drug delivery systems with its approaches.
BP704T.2	Explain polymers with its properties and applications.
BP704T.3	Outline drugs/polymers and approaches for development of novel drug delivery system.
BP704T.4	Predict quality control tests for various novel drug delivery systems.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP704T.1	3	2	2	-	-	1	-	-	1	-	3
BP704T.2	3	2	2	-	-	1	2	-	1	1	3
BP704T.3	3	2	2	2	-	1	1	2	-	-	3
BP704T.4	3	2	2	2	1	1	2	2	-	1	3
BP704T	3	2	2	2	1	1	2	2	1	1	3



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Justification for Novel Drug Delivery Systems [(Theory) (BP704T)]

PO1	As Novel Drug Delivery Systems is the core subject of pharmaceuticals so all the COs mapped to higher extent as it provides pharmacy knowledge to students.
PO2	Formulation of Novel drug delivery systems involves time management, resource management and delegation of skills so mapped at moderate level.
PO3	Novel drug delivery utilizes the principals of scientific concepts where the information can be applied systematically in order to draw the conclusion.
PO4	Various DoE methods can be used in formulation of and various statistical software's can be used in quality control analysis of Novel Drug delivery systems wherever required so mapped as moderate.
PO5	Understanding and performing quality control tests for various novel drug delivery systems will impart leadership skills and team building abilities in students so mapped at lower extent.
PO6	As pharmacist is a healthcare professional can communicate the value of his professional role to society to some extent so mapped as minimum.
PO7	Use of polymers, formulation development are closely associated to ethical principles whereas quality control tests sometimes involves animal experimentation so mapped at low to moderate extent.
PO8	The students sometimes may present/communicate their findings to society directly or through publications so mapped at moderate extent.
PO9	Students can use the knowledge gained in course related to drug delivery systems, drugs and polymers for societal health and safety so mapped at lower extent.
PO10	The biodegradability of polymers and involvement of animals in quality control testing may impact environment so mapped at lower extent.
PO11	As the course is core subject of pharmacy, it continues up gradation of knowledge and lifelong learning it is mapped at higher extent in all COs.

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R. L. TAWDE FOUNDATION'S
SAROJINI COLLEGE OF PHARMACY

R. S. No. 576, Near Rajendranagar Water Tank, Rajendranagar, Kolhapur. - 416004
E - mail - sarojini.instituteofpharmacy@gmail.com Website : www.sarojinicollegeofpharmacy.com





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Biostatistics and Research Methodology [(Theory) (BP801T)]

After completion of this course student will be able to:

BP801T.1	Apply knowledge of statistic like central tendency, variability and correlation of given data in solving statistical problem
BP801T.2	Analyze the concept of regression, probability and parametric test
BP801T.3	Apply the concept of non-parametric test, fundamentals of research and uses of graphs and designing methodology
BP801T.4	Explain the concept of regression modelling , practical components of industrial and clinical trial problems and uses of different software's
BP801T.5	Apply the concept of factorial design and response surface methodology

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP801T.1	3	2	2	3	2	-	3	2	2	-	3
BP801T.2	3	2	2	3	-	-	3	-	-	-	3
BP801T.3	3	2	2	3	2	2	3	2	2	-	3
BP801T.4	3	2	-	3	2	2	3	2	2	-	3
BP801T.5	3	2	2	3	2	2	3	-	2	-	3
BP801T	3	2	2	3	2	2	3	2	2	-	3



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Justification for Biostatistics and Research Methodology [(Theory) (BP801T)]

PO1	The curriculum provides the knowledge of statistics, probability, regression and its modelling, fundamentals of research and different experimental designs and methodology. Hence, all CO's are mapped high.
PO2	Students would be able to plan research and different study design required for the same. Hence, all CO's are mapped moderately.
PO3	Students will be able to think analytically and solve the problems on scientific basis. Hence, CO4 is not mapped and all other CO's are mapped moderately.
PO4	Students will utilize appropriate methods and software's to study different statistical parameters and research design. Hence, all CO's are mapped high.
PO5	Students will understand and can apply the knowledge gained in various domain such as data collection, utilization of software's and designing of experiments which will develop leadership qualities in them. Hence, CO1, CO3, CO4, CO5 are mapped moderately and no mapping for CO2.
PO6	The knowledge about research in pharmacy, designing methodology and utilization of software's for the same will provide unique identity to pharma professionals. Hence CO3, CO4 and CO5 are mapped moderately and no mapping for CO1, CO2.
PO7	Students will be able to learn and apply ethical principles in professional and social contexts. Hence, all CO's are mapped high.
PO8	The content of syllabus will help in developing the communication skill while collecting data, doing research studies etc. Hence CO1, CO3 and CO4 mapped moderately and no mapping for CO2 and CO5.
PO9	The contents of the syllabus provides knowledge of various domain like statistical operations, analysis of data, research and its designing methodologies which will applicable in solving problems of society. Hence CO1, CO3, CO4 .CO5 mapped moderately and no mapping for CO2.
PO10	No curriculum content is related to the environment and sustainability. Hence, no mapping
PO11	The curriculum provides the knowledge of statistics, probability, regression and its modelling, fundamentals of research and different experimental designs and methodology. Hence, all CO's are mapped high.

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Social and Preventive Pharmacy [(Theory) (BP802T)]

After completion of this course student will be able to:

BP802T.1	Develop high consciousness of current issues related to health and pharmaceutical problems within the country and worldwide.
BP802T.2	Develop a critical way of thinking based on current healthcare development.
BP802T.3	Evaluate alternative ways of solving problems related to health and pharmaceutical use.
BP802T.4	Describe a better health care service system and create awareness among public about health and hygiene.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP802T.1	2	2	2	-	2	3	2	3	3	2	2
BP802T.2	3	3	3	-	1	2	2	1	3	2	2
BP802T.3	3	3	3	-	3	3	2	2	3	2	2
BP802T.4	2	3	3	-	2	3	2	3	3	2	2
BP802T	3	3	3	-	2	3	2	3	3	2	2



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Justification for Social and Preventive Pharmacy [(Theory) (BP802T)]

PO1	The curriculum provides the knowledge of number of health issues and their challenges. Hence, COs are mapped high.
PO2	Students would be able to plan various campaigns and programs to create awareness among people of different diseases. Hence, all COs are mapped high.
PO3	The curriculum involves solving problems related to healthcare and making decisions during daily practice. Hence, COs are mapped high..
PO4	No utilization of modern tools is involved. Hence, no mapping done.
PO5	Students will be able work in groups and conduct community services. Hence, CO3 is mapped high and CO1, CO4 are mapped moderate and CO2 is mapped low.
PO6	Students will be able to help the community by contributing in various National health programs as a pharmacist. Hence, all COs are mapped high.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, all COs are mapped moderate.
PO8	Students will develop good communication skills and will be able to spread awareness among people regarding health and hygiene. Hence, all COs are mapped high.
PO9	Students will be able to strive for better wellbeing of the society by educating them about healthy lifestyle. Hence, all COs are mapped high.
PO10	Students will be able to make people aware about environmental cleanliness and sanitation. Hence, all COs are mapped moderate.
PO11	Students will get thorough information regarding healthy living which will be a lifelong learning for them. Hence, all CO's are mapped moderately.

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Pharmaceutical Regulatory Science [(Theory) (BP804T)]

After completion of this course student will be able to:

BP804T.1	Apply the study of Pharmaceutical Legislation, relevance, drug development and significance of regulatory authorities, affairs to Pharmaceutical Sciences.
BP804T.2	Apply fundamentals of registration of Indian drug to regulate import manufacture, distribution and sales of drug in overseas market.
BP804T.3	Describe the various parameters of INDA, NDA, and ANDA in accordance with regulatory agencies throughout the world.
BP804T.4	Explain the concepts of guidance, guidelines, regulations, laws and acts, code of federal regulatory.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP804T.1	3	2	3	1	-	2	3	3	2	1	2
BP804T.2	2	2	2	1	-	2	3	2	2	1	2
BP804T.3	2	3	2	1	-	2	3	2	1	2	2
BP804T.4	2	3	2	1	-	2	3	2	2	1	2
BP804T	3	3	2	1	-	2	3	2	2	1	2



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Justification for Anatomy and Physiology-I [(Theory) (BP101T)]

PO1	The curriculum provides the knowledge of legislation, laws, and acts of regulatory affairs. Hence, all CO's are mapped highly and moderately.
PO2	The Curriculum provides planning abilities and management of new drug development and discovery aspects. Hence, all CO's are mapped highly and moderately.
PO3	Students will be able to think analytically and solve the problems related to research and new drug discovery. Hence, CO's mapped highly and moderately.
PO4	The course deals with various applications and online filling. Hence mapped CO's mildly.
PO5	The course is irrelevant with the PO's. Hence, CO's are mapped mildly.
PO6	The curriculum would be the foundation for further professional identity in itself. Hence CO's are mapped highly and moderately.
PO7	Students will be able to apply ethical legislations in professional and social contexts. Hence, CO's are mapped highly and moderately.
PO8	Students will develop good communication skills and awareness about regulatory affairs. Hence, all CO's are mapped moderately.
PO9	The contents of the syllabus obligates towards societal consideration. Hence, mapped CO's moderately and mildly.
PO10	The curriculum content affects to the environment and sustainability. Hence, mapping is done mildly.
PO11	The students shall keep themselves updated, which requires lifelong learning. Hence, all CO's are mapped moderately.

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Pharmacovigilance [(Theory) BP805ET

After completion of this course student will be able to:

BP805ET.1	Evaluate drug safety monitoring is important and History and development of pharmacovigilance.
BP805ET.2	Demonstrate about international standards for classification of diseases and drugs and Dictionaries, coding and terminologies used in pharmacovigilance
BP805ET.3	Define about Adverse drug reaction reporting systems and communication in pharmacovigilance
BP805ET.4	Demonstrate ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning
BP805ET.5	Explain about Drug safety evaluation in pediatrics, geriatrics, pregnancy and lactation

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
BP805ET.1	3	2	2	2	1	-	1	2	1	1	3
BP805ET.2	3	2	2	-	2	2	1	1	1	1	3
BP805ET.3	3	2	2	2	2	2	1	2	1	-	3
BP805ET.4	2	1	1	2	1	-	-	2	1	1	2
BP805ET.5	3	2	2	2	2	2	-	1	1	1	2
BP805ET	3	2	2	2	2	2	1	2	1	1	3



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Justification for Pharmacovigilance [(Theory) BP805ET

PO1	The curriculum provides the knowledge about Pharmacovigilance and adverse drug reporting. Hence, all COs are mapped high.
PO2	Students will able to plan and demonstrate different drug dictionaries in PV and Classification of disease. Hence, all COs are mapped moderate.
PO3	Students will be able to think analytically and solve the problems on scientific basis. Hence mapped moderately.
PO4	Students will utilize appropriate methods and tools to evaluate and apply the information systematically. Hence are mapped moderately
PO5	Students will able to develop leadership skills and team building activities for the professional Practices, Hence COs are mapped moderately
PO6	The theoretical concepts and practical knowledge will help to create professional mind set in the students and take their work responsibly. Hence, mapping is done moderately.
PO7	Students will be able to apply ethical principles in professional and social contexts. Hence, are mapped low.
PO8	Students will able to develop effective communication with society, Hence COs are mapped moderately.
PO9	The contents of the syllabus do not obligate any societal consideration. Hence, low mapping
PO10	Students will establish relationship with the environment and sustainability. CO are mapped moderately.
PO11	The students shall keep themselves updated, which requires lifelong learning Hence all COs are mapped moderately.

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