



**Dr. Bhimrao Ambedkar University, Agra**

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A Documentary Support  
for  
*Matric No. – 1.1.2*  
**employability/ entrepreneurship/ skill development**

*under the*  
**Criteria - I**  
**(Curriculum Design and Development)**

*Key Indicator - 1.1*

*in*  
*Matric No. – 1.1.2*

**BACHELOR OF PHARMA**

2002

**Mapping of course to:**

 Employability  Entrepreneurship  Skills Development

  
Registrar  
Dr. B.R.A. University, Agra

## B. PHARM (PROGRAMME OUTCOME)

- **PO1-Pharmacy Knowledge** : Possess an understanding of the fundamental concepts and knowledge needed to practise pharmacy, including biological and pharmaceutical sciences, as well as behavioural, social, and administrative pharmacy fields and manufacturing techniques.
- **PO2-Planning Abilities** : Possess strong planning skills, particularly those for managing time, resources, delegating, and organisation. Create and carry out plans, and schedule tasks to meet deadlines.
- **PO3-Problem analysis** : Apply scientific inquiry principles to problem-solving and decision-making in daily practise by thinking critically, analytically, and clearly. Make rational decisions by doing systematic information gathering, analysis, evaluation, and application.
- **PO4-Modern tool usage** : Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
- **PO5-Leadership skills** : When preparing adjustments necessary to achieve ethical, professional, and social obligations, understand how people react to change, motivational factors, leadership, and team-building. Assume leadership responsibilities or active citizenship duties when necessary to promote improvements in health and wellbeing.
- **PO6-Professional Identity** : Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
- **PO7-Pharmaceutical Ethics** : Respect one's moral ideals and use them in social and professional settings. Show behaviour that acknowledges cultural and individual differences in values, communication, and lifestyles. Apply ethical principles while making judgements, use ethical frameworks when doing so, and accept responsibility for the results of your choices.
- **PO8-Communication** : Well communicate with the pharmacy community and the general public, including the ability to understand and produce effective reports, present and document well, and give and receive clear directions.
- **PO9-The Pharmacist and society** : Assess societal, health, safety, and legal issues, as well as the resulting obligations pertinent to the professional practise of pharmacy, using reasoning supported by contextual knowledge.
- **PO10-Environment and sustainability** : Understanding the effects of professional pharmacy solutions in societal and environmental contexts, as well as demonstrating awareness of and the need for sustainable development, are part of PO10—Environment and sustainability.
- **PO11-Life-long learning** : Understand the importance of, and be prepared for, autonomous lifelong learning in the broadest sense of technological development. Use self-evaluation and other people's feedback to your advantage to pinpoint your own learning needs and continuously meet them.



**B. PHARM (ALL PHARMACEUTICS SUBJECT)  
CO (COURSE OUTCOME)**

<b>NAME OF SUBJECT:</b>		<b>PHARMACEUTICS I</b>
<b>SUBJECT CODE :</b>		<b>(BP103T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>Ist</b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	Students will be able to learn about pharmacy careers, pharmacopoeias, and the history of the pharmacy profession in India after completing this course.	L3
CO2	Learn about the various dosage forms, prescriptions, and their component parts, as well as how to calculate a dose based on the patient's age, weight, and body surface area.	L3
CO3	Students will be able to comprehend pharmaceutical calculations, their many systems, and techniques of computation after completing this course.	L2
CO4	Describe liquid and powder dosage forms, excipients employed in their creation, and methods used to increase solubility.	L2
CO5	After completing this course, students will be able to describe the various monophasic liquid formulation types and how they are made.	L3
CO6	Describe the biphasic liquid formulations, the stability issues that come with them, and the solutions to these issues.	L3
CO7	Students will get knowledge about suppository preparation techniques, displacement value, and computations after completing this course.	L3
CO8	Give examples of pharmacological incompatibilities of each kind.	L3
CO9	Students will be able to describe semisolid dosage forms, methods and factors influencing drug skin penetration, manufacture of various types of semisolid dosage forms, and evaluation of such forms after completing this course.	L3

NAME OF SUBJECT :		<b>PHYSICAL PHARMACEUTICS I</b>
SUBJECT CODE :		<b>(BP302T)</b>
BRANCH		<b>B.Pharm</b>
SEMESTER		<b>3<sup>rd</sup></b>
SESSION		<b>2022-2023</b>
FACULTY NAME		<b>Dr. Bhoomika Chaudhary</b>
CO STATEMENT: The student will be able to		Level
CO1	Students will be able to comprehend the mechanics of solute-solvent interactions, various factors that increase the solubility of pharmaceuticals, and diffusion principles in biological systems after completing this course.	L3
CO2	Learn about the many types of liquids, Raoult's law, the distribution law, the solubility of gas in liquids, and the solubility of liquid in liquids.	L3
CO3	Students will be able to comprehend eutectic mixtures, various solid forms, and the states and properties of matter after completing this course.	L2
CO4	In creating the dosage forms, describe the various physicochemical features of the medicinal compounds.	L2
CO5	After completing this course, students will be able to define surface tension, distinguish it from interfacial tension, and understand several techniques for measuring both tensions.	L3
CO6	Describe HLB Scale, surface active agents, and adsorption at solid-liquid interfaces.	L3
CO7	Students will be able to understand complexation, various types of complexation, and their techniques of analysis after completing this course.	L3
CO8	Describe protein binding and how it affects the way drugs work and complex crystal structures.	L3
CO9	Students who successfully complete this course will be able to explain the pH scale proposed by Sorensen, its methods of determination, buffer isotonic solutions, the rationale for preserving the isotonicity of medication solutions, and buffers in pharmaceutical and biological systems.	L3

<b>NAME OF SUBJECT :</b>		<b>PHARMACEUTICAL ENGINEERING</b>
<b>SUBJECT CODE :</b>		<b>(BP304T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>3<sup>rd</sup></b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	Recognize the importance of size reduction, size separation and fluid flow during pharmaceutical manufacturing.	L3
CO2	Schematize and apply the principles of different heat processes used in pharmaceutical industries.	L3
CO3	Describe the mechanisms and applications of drying and mixing processes.	L2
CO4	Solve the issues related to filtration and centrifugation.	L2
CO5	Apply different preventive methods used for the control of corrosion in pharmaceutical plants.	L3

<b>NAME OF SUBJECT :</b>		<b>PHYSICAL PHARMACEUTICS-II</b>
<b>SUBJECT CODE :</b>		<b>(BP-403T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>4th</b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	To create a dosage form, one must be aware of the many physicochemical features of drug molecules.	L3
CO2	Recognise how viscosity and flow behaviour relate to the development of formulations and the assessment of dose forms.	L3
CO3	Understanding of physicochemical characteristics, formulation elements, and instability markers in the development of biphasic liquid dosage forms.	L2
CO4	Explain how to incorporate particle size variables into the creation of dosage forms.	L2

<b>NAME OF SUBJECT :</b>		<b>INDUSTRIAL PHARMACY-I</b>
<b>SUBJECT CODE :</b>		<b>(BP502T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>5<sup>th</sup></b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
CO5	Understanding chemical kinetic principles and applying them to formula expiration dates	L3
<b>CO STATEMENT:</b> The student will be able to		Level
CO1	Learn about pre-formulation analysis	L3
CO2	Students should be able to explain the manufacturing process for tablets, syrups, suspensions, and emulsions.	L3
CO3	Learn about the numerous factors that go into the creation of capsules and pellets.	L2
CO4	Recognise the production processes for the dosage forms ophthalmic and prenteral.	L2
CO5	Competent to develop cosmetic products and comprehend packaging for pharmaceuticals.	L3

<b>NAME OF SUBJECT:</b>		<b>PHARMACEUTICAL JURISPRUDENCE</b>
<b>SUBJECT CODE :</b>		<b>(BP505T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>5th</b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		Level
CO1	The regulations governing medicines and how they affect the creation and promotion of drugs.	L3
CO2	Various pharmaceutical laws and acts in India.	L3
CO3	The organisations and bodies that oversee the production and distribution of medications.	L2
CO4	The code of ethics for the practise of pharmacy.	L2
CO5	Different Intellectual-Property Rights.	L3
CO6	An assortment of offences and punishments for breaking certain Acts.	L2

<b>NAME OF SUBJECT:</b>		<b>BIOPHARMACEUTICS &amp; PHARMACOKINETICS</b>
<b>SUBJECT CODE :</b>		<b>(BP604T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>6<sup>th</sup></b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	After completion of this course students will be able to understand the mechanisms of drug absorption through GIT, factors influencing drug absorption through GIT and absorption of drug from non per oral extra-vascular routes.	L3
CO2	Know about the tissue permeability of drugs, kinetics of protein binding and clinical significance of protein binding of drugs.	L3
CO3	After completion of this course students will be able to understand the basic understanding of metabolic pathways, factors affecting renal excretion of drugs and non renal routes of drug excretion of drugs.	L2
CO4	Know about the absolute and relative bioavailability, in-vitro drug dissolution models, in-vitro-in-vivo correlations, bioequivalence studies and methods to enhance the dissolution rates and bioavailability of poorly soluble drugs.	L2
CO5	After completion of this course students will be able to explain compartmental modeling, various pharmacokinetic parameters, their significance and applications.	L3
CO6	After completion of this course students will be able to know about kinetics of multiple dosing, calculations of loading and maintenance doses and their significance.	L2
CO7	After completion of this course students will be able to understand the concept of non-linear pharmacokinetics and factors causing non-linearity and Michaelis-menton method of estimating parameters.	L3



<b>NAME OF SUBJECT:</b>		<b>INDUSTRIAL PHARMACY-I</b>
<b>SUBJECT CODE :</b>		<b>(BP606T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>6<sup>th</sup></b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	Understand the fundamental ideas behind GMP, cGMP, and GLP in the pharmaceutical sector.	L3
CO2	Educate yourself with ICH guidelines and stability testing guidelines.	L3
CO3	Describe the value of documentation.	L2
CO4	Determine the duties of the QA and QC departments.	L2
CO5	Learn about secondary packaging materials, rubber closures, and quality control testing for containers.	L3

<b>NAME OF SUBJECT:</b>		<b>INDUSTRIAL PHARMACY-II</b>
<b>SUBJECT CODE :</b>		<b>(BP702T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>7<sup>th</sup></b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	Learn how to scale up pharmaceutical dosage forms and the pilot plant procedure.	L3
CO2	Interpreting and explaining the technology transfer process from lab scale to commercial batch.	L3
CO3	Learn about the various laws and ordinances that govern the pharmaceutical sector.	L2
CO4	Recognise the regulatory guidelines and procedures for drug product approval.	L2
CO5	Equipped to comprehend the Indian regulatory structure and the quality management system.	L3

NAME OF SUBJECT:		PHARMACY PRACTICE
SUBJECT CODE :		(BP703T)
BRANCH		B.Pharm
SEMESTER		7 <sup>th</sup>
SESSION		2022-2023
FACULTY NAME		Dr. Bhoomika Chaudhary
CO STATEMENT: The student will be able to		Level
CO1	Know and understand the Hospital organization and detect and assess adverse drug reactions, reporting and its management.	L3
CO2	Knowledge of various drug distribution methods system in the hospital, and monitor drug therapy of Patient, role pharmacist in medication adherence and community pharmacy management .also know how to obtain medication history interview	L3
CO3	Know and understand guideline of know pharmaceutical care services such therapeutic committee, drug information services, patient counseling, and also able to answer the role of pharmacist in education and training of program., monitor drug therapy of patient through medication chart review and clinical review.	L2
CO4	Able to understand the medication of management, budget preparation and its implementation, and also help in rational use of common over the counter medication	L2
CO5	Able to understand the appreciate pharmacy stores and inventory control management and able to interpret selected laboratory results of specific disease states and controlling of investigational use of drugs.	L3

<b>NAME OF SUBJECT:</b>		<b>NOVEL DRUG DELIVERY SYSTEMS</b>
<b>SUBJECT CODE :</b>		<b>(BP704T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>7<sup>th</sup></b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	Know the criteria for selection of drugs and polymers for the development of novel drug delivery systems and understand various approaches for development of novel drug delivery systems, their formulation and evaluation.	L3
CO2	Know the approaches, technologies and drug carriers used in the process of drug delivery which serves to improve the selectivity, effectiveness, and/or safety of drug administration.	L3
CO3	The students should understand about Transdermal Drug Delivery Systems, Gastro-retentive drug delivery systems and Naso-pulmonary drug delivery system.	L2
CO4	To understand Targeted Drug Delivery including liposomes, niosomes, nanoparticles, monoclonal antibodies.	L2
CO5	To understand Ocular Drug Delivery Systems and Intrauterine Drug Delivery Systems including intra uterine devices (IUDs).	L3

<b>NAME OF SUBJECT:</b>		<b>SOCIAL AND PREVENTIVE PHARMACY</b>
<b>SUBJECT CODE :</b>		<b>(BP802T)</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>8<sup>th</sup></b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	Able to learn about health issues, diseases, and health education, as well as obtain understanding about diet and hygiene.	L3
CO2	Learn about the prevention and treatment of many diseases.	L3
CO3	Possess knowledge of numerous national health programmes.	L2
CO4	Awareness of the national health intervention programme.	L2
CO5	Understand about NRHM and NUHM, as well as community services.	L3

<b>NAME OF SUBJECT:</b>		<b>PHARMACEUTICAL MARKETING MANAGEMENT</b>
<b>SUBJECT CODE :</b>		<b>BP803ET</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>8<sup>th</sup></b>
<b>SESSION</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	Students are able to study about pharmaceutical marketing.	L3
CO2	Students who learn about product positioning in pharmaceutical marketing may comprehend how to promote pharmaceutical products in a cutthroat industry.	L3
CO3	The goal of the course is to give students a basic understanding of pharmaceutical marketing channels.	L2
CO4	The personnel are prepared to take on tough roles in sales and product management by the knowledge and expertise of marketing management.	L2
CO5	Students are able to study about pharmaceutical marketing.	L3

<b>NAME OF SUBJECT:</b>		<b>PHARMACEUTICAL REGULATORY SCIENCE</b>
<b>SUBJECT CODE :</b>		<b>BP804ET</b>
<b>BRANCH</b>		<b>B.Pharm</b>
<b>SEMESTER</b>		<b>8<sup>th</sup></b>
<b>SESSION :</b>		<b>2022-2023</b>
<b>FACULTY NAME</b>		<b>Dr. Bhoomika Chaudhary</b>
<b>CO STATEMENT:</b> The student will be able to		<b>Level</b>
CO1	Learn about the drug development process, innovator and generic drug concepts.	L3
CO2	Understand the regulatory guidance and guidelines for the creation of dossiers and their submission to regulatory bodies in various countries, as well as the filing and approval procedure.	L3
CO3	Learn about the regulatory organisations and authorities that control the production and distribution of medicines as well as the filing of international papers in CTD/eCTD and ASEAN formats.	L2
CO4	Recognise the pharmacovigilance, clinical trial monitoring procedures, and requirements for obtaining approvals to conduct clinical studies.	L2
CO5	Comprehension of regulatory guidance, rules, statutes, and acts, as well as fundamental vocabulary.	L3

NAME OF SUBJECT:		<b>COSMETIC SCIENCE</b>
SUBJECT CODE :		BP809 ET
BRANCH		B.Pharm
SEMESTER		8 <sup>th</sup>
SESSION		2022-2023
FACULTY NAME		Dr. Bhoomika Chaudhary
CO STATEMENT: The student will be able to		Level
CO1	Learn about the key elements used in cosmeceuticals and cosmetics.	L3
CO2	Recognise the fundamental components of cosmetics for a variety of compositions.	L3
CO3	Understanding the most recent technologies available	L2
CO4	Knowing scientific concepts will help you create cosmetics and cosmeceuticals with the desired level of safety.	L2
CO5	Application of cosmetics to a variety of diseases.	L3

<b>NAME OF SUBJECT:</b>		<b>DIETARY SUPPLEMENTS AND NUTRACEUTICALS</b>	
<b>SUBJECT CODE :</b>		BP812 ET	
<b>BRANCH</b>		B.Pharm	
<b>SEMESTER</b>		8 <sup>th</sup>	
<b>SESSION</b>		2022-2023	
<b>FACULTY NAME</b>		Dr. Bhoomika Chaudhary	
<b>CO STATEMENT:</b> The student will be able to			<b>Level</b>
CO1	Recognise how diverse groups of individuals require supplements to maintain healthy lives.		L3
CO2	Recognise how diverse groups of people need supplements to sustain healthy lives and what happens when dietary supplements are deficient.		L3
CO3	Learn about the generation of free radicals and their negative effects on lipids, proteins, carbohydrates, nucleic acids, and study on complex carbs and dietary fibre.		L2
CO4	Know how free radicals affect different disorders and ageing, the value of different antioxidants, and how different environmental circumstances affect the effectiveness of nutraceuticals.		L2
CO5	Recognise the dietary supplement industry's commercial and regulatory components, including health claims. to learn about food adulteration.		L3

NAME OF SUBJECT:		PHARMACEUTICAL PRODUCT DEVELOPMENT	
SUBJECT CODE :		BP813 ET	
BRANCH		B.Pharm	
SEMESTER		8 <sup>th</sup>	
SESSION		2022-2023	
FACULTY NAME		Dr. Bhoomika Chaudhary	
CO STATEMENT: The student will be able to			Level
CO1	Describe the evolution of pharmaceutical products.		L3
CO2	Understand pharmaceutical ingredients		L3
CO3	By using quality by design (QbD) methods, pharmaceutical product development can be improved.		L2
CO4	Excipients are used in therapeutic compositions.		L2
CO5	Conduct various formulation quality control tests.		L3


 Employability


 Entrepreneurship


 Skill Development