



**DEVI AHILYA VISHWAVIDYALAYA, INDORE**  
**SCHOOL OF PHARMACY**

Takshashila Campus, Khandwa Road (Ring Road) Indore-452001, India

E-mail: sopdavv@gmail.com

Site: www.dauniv.ac.in, www.pharmacy.dauniv.ac.in



**COURSE OUTCOME: B.Pharm. CBCS SCHEME (w.e.f.-2015-2016)**

**B. Pharm. Semester-I**

Course code	Name of the course	Course Outcome
<b>PYB-101(A) T</b>	<b>Remedial Mathematics</b>	Upon completion, students would have learnt application of mathematical concepts and principles to perform computations for pharmaceutical sciences. They would be able to create, use and analyze mathematical representations and mathematical relationships.
<b>PYB-101(B) T</b>	<b>Remedial Biology</b>	The course would provide the insight of salient features of five kingdoms of life and the basic components of anatomy & physiology of plant. They would know about cell biology, morphology and classification system of Plant cell.
<b>PYB -101 P</b>	<b>Remedial Biology Practicals</b>	Upon completion of course, student would have understanding of experimental biology including basics of microscope and microscopic studies of cell and its inclusion and plants.
<b>PYB -103 T</b>	<b>Pharmaceutics-I</b>	Upon completion of this course the students would know the history of profession of pharmacy, prescription handling and its significance and the basics of different dosage forms.
<b>PYB -103 P</b>	<b>Pharmaceutics-I Practical</b>	Practical Pharmaceutics would impart a fundamental knowledge on the formulation of the different conventional dosage forms.
<b>PYP -105 T</b>	<b>Inorganic Medicinal Chemistry</b>	Upon completion of course student shall be able to know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals. They would have understanding of the medicinal and pharmaceutical importance of inorganic compound.
<b>PYB -105 P</b>	<b>Inorganic Medicinal Chemistry Practical</b>	Practicals would provide insight of the monographs of inorganic drugs and pharmaceuticals along with their testing.
<b>PYB -107 T</b>	<b>Human Anatomy and Physiology-I</b>	Upon completion of this course the student should be able to explain the gross morphology, structure and functions of various organs of the human body. It also helps in understanding various homeostatic mechanisms and their imbalances.

<b>PYB -107 P</b>	<b>Human Anatomy and Physiology-I Practicals</b>	Practicals of physiology allow the clear understanding for identification of the various tissues and organs of different systems of human body and to perform the various experiments related to special senses.
<b>PYB -109 T</b>	<b>Environmental Science</b>	This program shall create an awareness about environmental problems, develop an attitude towards of concern for the environment and Motivate learner to participate in environment protection and environment improvement.
<b>PYB -111 T</b>	<b>IT Skills for Pharmacists</b>	On completion of this course, the students will be able to apply the fundamentals of computer application in pharmacy. They would have knowledge of various databases and their application in pharmacy.
<b>PYB -111 P</b>	<b>IT Skills for Pharmacists Practicals</b>	Practical would provide experimental skills to create, store and retrieve various database.

### B. Pharm. Semester-II

<b>Course code</b>	<b>Name of the course</b>	<b>Course Outcome</b>
<b>PYB-102 T</b>	<b>Mathematics and Biostatistics</b>	Upon completion, students would have learnt application of mathematical concepts and principles to perform computations for pharmaceutical sciences. They would be able to create, use and analyze mathematical representations and mathematical relationships. Upon completion of the course the student shall be able to Know the operation of ANOVA, f-test, t-test and various other statistical techniques to solve statistical problems
<b>PYB-104 T</b>	<b>Pharmaceutical Microbiology</b>	Upon completion of the subject student shall know methods of identification, cultivation and preservation of various microorganisms. They would understand the importance and implementation of sterilization in pharmaceutical processing and industry. They shall have the knowledge of microbiological standardization of Pharmaceuticals, the cell culture technology and its applications in pharmaceutical industries.

<b>PYB-104 P</b>	<b>Pharmaceutical Microbiology Practicals</b>	They would have knowledge of basic principles involved in sterility testing, microbiological assay, staining and culture media.
<b>PYB-106 T</b>	<b>Pharmaceutical Chemistry-I (Organic-I)</b>	Upon completion of the course the student would have the understanding of the structure, name and the type of isomerism of the organic compound. They would be able to understand the reaction, name the reaction and orientation of reactions. They shall be able to identify/confirm the identification of organic compound.
<b>PYB-106 P</b>	<b>Pharmaceutical Chemistry-I (Organic-I) Practicals</b>	Practicals would allow students to perform Systematic qualitative analysis of unknown organic compounds, preparation of suitable solid derivatives from organic compounds and construction of molecular models.
<b>PYB-108 T</b>	<b>Human Anatomy and Physiology-II</b>	Upon completion of this course the student Students would have studied the gross morphology, structure and functions of various organs of the human body, various homeostatic mechanisms and their imbalances, identification of various tissues and organs of different systems of human body. They would have insight of working pattern of different organs of each system in coordination.
<b>PYB-108 P</b>	<b>Human Anatomy and Physiology-II Practicals</b>	Practical physiology would allow the students to understand physiological processes through charts/models. This is helpful for developing an insight on the subject.
<b>PYB-110 T</b>	<b>Pharmacognosy-I</b>	Upon completion of the course, the student shall be able to know the techniques in the cultivation and production of crude drugs, the crude drugs, their uses and chemical nature. They would know the evaluation techniques for the herbal drugs and the microscopic and morphological evaluation of crude drugs.
<b>PYB-110 P</b>	<b>Pharmacognosy-I Practicals</b>	The students would know the determination of various pharmacognostic parameters like stomatal index, swelling index, stomatal number, etc.
<b>PYB-112 T</b>	<b>Professional Communication</b>	Upon completion of the course the student shall be able to communicate effectively (Verbal and Non Verbal) and manage the team as a team player. These all would add value to the pharmaceutical business.



### B. Pharm. Semester-III

Course code	Name of the course	Course Outcome
PYB-201 T	Pharmacognosy-II	Upon completion of the course, the student shall be able to know the techniques in the cultivation and production of crude drugs, the crude drugs, their uses and chemical nature. They would know the evaluation techniques for the herbal drugs and the microscopic and morphological evaluation of plants.
PYB-201 P	Pharmacognosy-II Practicals	The students would know the determination of various morphological parameters of plants.
PYB-203 T	Pharmaceutical Analysis- I	The subject content would help to understand the fundamental of analytical chemistry electrochemical analytical techniques. Upon completion of the course student shall be able to understand the principles of volumetric and electro chemical analysis, carryout various volumetric and electrochemical titrations. It would help to develop analytical skills
PYB-203 P	Pharmaceutical Analysis- I Practical	Upon completion of course, students would be able to deals with the principles of electrochemical analysis of drugs and techniques to perform the estimation of different category drugs.
PYB-205 T	Physical Pharmacy-I	Upon the completion of the course students would have the understanding of physicochemical properties of drug molecules like solubility, distribution, adsorption, and stability for application in dosage forms designing. They would know the role of surfactants, interfacial phenomenon and thermodynamics. Also, the principles o protein binding and its significance.
PYB-205 P	Physical Pharmacy-I Practicals	Practicals in Physical Pharmacy would help to understand the concepts of partition coefficient, phase diagram, adsorption isotherm and surfactants.
PYB-207 T	Pharmaceutical Chemistry-II (Organic-II)	Upon completion of the course the student would have the understanding of the structure, name and the type of isomerism of the organic compound. They would be able to

		understand the reaction, name the reaction and orientation of reactions. They shall be able to identify/confirm the identification of organic compound.
<b>PYB-207 P</b>	<b>Pharmaceutical Chemistry-II (Organic-II) Practicals</b>	Practicals would allow students to perform Systematic qualitative analysis of unknown organic compounds, preparation of suitable solid derivatives from organic compounds and construction of molecular models.
<b>PYB-209 T</b>	<b>Generic Elective-I (Food Science Technology)</b>	Upon completion students would be able to know the composition, chemical constituents and nutritive value of food products. Also they shall be aware of laws and standard related to food products and technology.
<b>PYB-209 T</b>	<b>Generic Elective-I (Health Education)</b>	Upon completion students would be able to know the Concepts of Health and Disease, Health problems in India, Social factors effecting health. Environment and Health, Economics and health. Disease causing agents and prevention of disease. Also various organizations and their objectives like WHO.

#### B. Pharm. Semester-IV

<b>Course code</b>	<b>Name of the course</b>	<b>Course Outcome</b>
<b>PYB-202 T</b>	<b>Pharmaceutics –II</b>	Students shall have understanding of formulation and additives employed in pharmaceutical dosage forms and various considerations in development of pharmaceutical dosage forms.
<b>PYB-202 P</b>	<b>Pharmaceutics –II Practicals</b>	Students shall be able to design a dosage forms and evaluate them for their quality.
<b>PYB-204 T</b>	<b>Pharmaceutical Analysis-II</b>	The subject content would help to understand the fundamental of analytical chemistry electrochemical analytical techniques. Upon completion of the course student shall be able to understand the principles of volumetric and electro chemical analysis, carryout various volumetric and electrochemical titrations. It would help to develop analytical skills
<b>PYB-204 P</b>	<b>Pharmaceutical Analysis-II Practicals</b>	Upon completion of course, students would be able to deals with the principles of electrochemical analysis of drugs and techniques to perform the estimation of different category drugs.

<b>PYB-206 T</b>	<b>Pharmaceutical Biochemistry</b>	Upon completion of course student shall be able to understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes. They would have learnt the metabolism of nutrient molecules in physiological and pathological conditions. Also, they would be able to understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
<b>PYB-206 P</b>	<b>Pharmaceutical Biochemistry Practicals</b>	The student would be able to determine qualitatively /quantitatively sugars, starch, carbohydrates and protein.
<b>PYB-208 T</b>	<b>Physical Pharmacy-II</b>	Upon the completion of the course student shall be able to understand various physicochemical properties of drug molecules and their application in formulation development and evaluation of dosage forms.
<b>PYB-208 P</b>	<b>Physical Pharmacy-II Practicals</b>	Practicals in Physical Pharmacy would help to understand the applications of theoretical concepts experimentally in dosage forms.
<b>PYB-210 T</b>	<b>Generic Elective-II Intellectual Property Rights</b>	Upon the completion of the course student shall be able to understand concept of Intellectual Property Protection, its importance and its application in commercialization.
<b>PYB-210 P</b>	<b>Generic Elective-II Consumer Rights</b>	Upon the completion of the course student shall be able to understand concept, definition and laws of consumer rights. They shall know the procedure for consumer redressal agencies and Appeals.

### B. Pharm. Semester-V

<b>Course code</b>	<b>Name of the course</b>	<b>Course Outcome</b>
<b>PYB-301 T</b>	<b>Pharmaceutics-III</b>	Students shall have understanding of various pharmaceutical dosage forms and their manufacturing techniques. Various considerations in development of pharmaceutical dosage forms.
<b>PYB-301 P</b>	<b>Pharmaceutics-III Practicals</b>	Students shall be able to formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.
<b>PYB-303 T</b>	<b>Medicinal Chemistry-I</b>	Upon completion of the course the student shall be able to understand the chemistry of drugs with respect to their pharmacological activity, the drug metabolic pathways, adverse effect and therapeutic value of drugs. They will know the



		Structural Activity Relationship (SAR) of different class of drugs and would have learnt the chemical synthesis of some drugs
<b>PYB-303 P</b>	<b>Medicinal Chemistry-I Practicals</b>	The students would able to synthesis drugs/intermediates and also could perform assay of drugs
<b>PYB-305 T</b>	<b>Pharmacognosy-III</b>	Upon completion of the course, the students would know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents. They shall have understanding of the herbal drug interactions.
<b>PYB-305 P</b>	<b>Pharmacognosy-III Practicals</b>	Students shall have learnt the preparation and development of herbal formulation to carryout isolation and identification of phytoconstituents.
<b>PYB-307 T</b>	<b>Pharmacology-I</b>	Upon completion of this course the students would know the pharmacological actions of different categories of drugs, the mechanism of drug action at organ system/sub cellular/macromolecular levels. They shall be able to apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
<b>PYB-307 P</b>	<b>Pharmacology-I Practicals</b>	Students would know the basics of experimental pharmacology. They would be able to correlate their theoretical knowledge with the pharmacological data obtained from various experiments.
<b>PYB-309 T</b>	<b>DSE-I Dietary Supplements and Nutraceuticals</b>	Definitions of Functional foods, Nutraceuticals and Dietary supplements. Classification of Nutraceuticals, Health problems and diseases that can be prevented or cured by Nutraceuticals.
<b>PYB-309 T</b>	<b>DSE-I Cosmetic Science</b>	Upon completion of course, student shall be able to understanding of fundamentals of skins, teeth, hairs and their related problems. They shall know the composition and excipients used in formulation of various cosmetic preparations and their evaluation.

### B. Pharm. Semester-VI

<b>Course code</b>	<b>Name of the course</b>	<b>Course Outcome</b>
<b>PYB-302T</b>	<b>Pharmaceutical Engineering</b>	Upon completion of the course student would know various unit operations used in Pharmaceutical industries, the material handling techniques and various processes involved in pharmaceutical manufacturing. They would understand and comprehend significance of plant lay out design for optimum use of resources.

		Also, they would know the various preventive methods used for corrosion control in Pharmaceutical Industries.
<b>PYB-302 P</b>	<b>Pharmaceutical Engineering Practicals</b>	Practicals of Engineering would impart practical application of concepts and equipments in pharmaceutical industries.
<b>PYB-304 T</b>	<b>Medicinal Chemistry-II</b>	Upon completion of the course the student shall be able to understand the chemistry of drugs with respect to their pharmacological activity, the drug metabolic pathways, adverse effect and therapeutic value of drugs. They will know the Structural Activity Relationship (SAR) of different class of drugs and would have learnt the chemical synthesis of some drugs
<b>PYB-304 P</b>	<b>Medicinal Chemistry-II Practicals</b>	The students would able to synthesis drugs/intermediates and also could perform assay of drugs.
<b>PYB-306 T</b>	<b>Pharmacology-II</b>	Upon completion of this course the students would know the pharmacological actions of different categories of drugs, the mechanism of drug action at organ system/sub cellular/macromolecular levels. They shall be able to apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
<b>PYB-306 P</b>	<b>Pharmacology-II Practicals</b>	Upon completion of this course the students would know the basics of animal handling and care, the design of Pharmacological experiments to understand the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
<b>PYB-308 T</b>	<b>Pharmaceutical Biotechnology</b>	Upon completion of the subject student shall be able to understand the importance and application of Immobilized enzymes, recombinant DNA technology, fermentation techniques and ELISA in production in pharmaceutical industry.
<b>PYB-310 T</b>	<b>Pharmaceutics Jurisprudence and Ethics</b>	Upon completion of the course, the student shall be able to understand the code of ethics during the pharmaceutical practice, the Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals, various Indian pharmaceutical Acts and Laws. They shall be able to know various regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals in India.
<b>PYB-312 T</b>	<b>Discipline Specific Elective-II Packaging Technology</b>	Upon completion of the course, the student shall be able to understand various packaging material, their composition, functions and evaluation parameters. They shall also know the regulatory aspect of various packaging materials and techniques to



		pack different pharmaceutical dosage forms.
<b>PYB-312 T</b>	<b>Discipline Specific Elective-II Drug Design</b>	Upon completion of the course, the student shall be able to understand, about drug discovery, Quantitative Structure Activity Relationship (QSAR), molecular modeling and its application in drug designing.

### B. Pharm. Semester-VII

<b>Course code</b>	<b>Name of the course</b>	<b>Course Outcome</b>
<b>PYB-401 T</b>	<b>Pharmaceutics IV</b>	Students shall have understanding of various pharmaceutical dosage forms and their manufacturing techniques. Various considerations in development of pharmaceutical dosage forms.
<b>PYB-401 P</b>	<b>Pharmaceutics IV Practicals</b>	Students shall be able to formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.
<b>PYB-403 T</b>	<b>Medicinal Chemistry- III</b>	Upon completion of the course the student shall be able to understand the chemistry of drugs with respect to their pharmacological activity, the drug metabolic pathways, adverse effect and therapeutic value of drugs. They will know the Structural Activity Relationship (SAR) of different class of drugs and would have learnt the chemical synthesis of some drugs.
<b>PYB-403 P</b>	<b>Medicinal Chemistry- III Practicals</b>	The students would able to synthesis drugs/intermediates and also could perform assay of drugs.
<b>PYB-405 T</b>	<b>Pharmaceutical Analysis-III</b>	Upon completion of the course the student shall be able to understand the interaction of matter with electromagnetic radiations and its applications in drug analysis. They shall understand the chromatographic separation and analysis of drugs.
<b>PYB-405 P</b>	<b>Pharmaceutical Analysis-III Practicals</b>	They shall know the quantitative & qualitative analysis of drugs using various analytical instruments.
<b>PYB-407 T</b>	<b>Pharmacology-III</b>	Upon completion of this course the students would know the pharmacological actions of different categories of drugs, the mechanism of drug action at organ system/sub cellular/macromolecular levels. They shall be able to apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
<b>PYB-407 P</b>	<b>Pharmacology-III Practicals</b>	Students would know the basics of experimental pharmacology. They would be able to correlate their theoretical knowledge with the pharmacological data obtained from various experiments.

<b>PYB-409 T</b>	<b>Discipline Specific Elective – III Pharmaceutical Regulatory Science</b>	Upon completion of the subject student shall be able the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals. Also, they would know various regulatory approval process and their registration in Indian and international markets.
<b>PYB-409 T</b>	<b>Discipline Specific Elective – III Pharmacovigilance</b>	Upon completion of course, students shall know importance of drug safety monitoring, pharmacovigilance, detection of new adverse drug reactions and their assessment, methods to generate safety data during pre clinical, clinical and post approval phases of drugs' life cycle. They shall also have knowledge of ICH guidelines and objectives in reporting.

### B. Pharm. Semester-VIII

<b>Course code</b>	<b>Name of the course</b>	<b>Course Outcome</b>
<b>PYB-402T</b>	<b>Pharmaceutics V (Bio-pharmaceutics &amp; Pharmacokinetics)</b>	Upon completion of the course student shall be able to understand the basic concepts in biopharmaceutics, compartment models and pharmacokinetics and their significance. They shall know significance of plasma drug concentration-time curve, to calculate the pharmacokinetic parameters and their application. They shall have understanding of bioavailability and bioequivalence of drug products and their significance.
<b>PYB-402 P</b>	<b>Pharmaceutics V (Bio-pharmaceutics &amp; Pharmacokinetics) Practicals</b>	Practicals would provide the experimental insight of compartment modeling, plasma drug concentration-time curve, pharmacokinetic parameters and their calculation.
<b>PYB-404 T</b>	<b>Pharmaceutical Industrial Management and Accountancy</b>	Students shall have an understanding of management, organisations concepts, accountancy and book keeping systems with financial accountancy.
<b>PYB-406 T</b>	<b>Pharmaceutical Quality Assurance</b>	Upon completion of the course student shall be able to understand the importance of cGMP, documentation aspects and the responsibilities of QA & QC departments in a pharmaceutical industry.
<b>PYB-408 T</b>	<b>Generic Elective-III Pharmaceutical Marketing</b>	Students shall have an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry.

<b>PYB-408 T</b>	<b>Generic Elective-III Clinical Pharmacy and Drug Interactions</b>	Principles of clinical pharmacology and clinical toxicology. They shall know the rationale for drug use and evaluation of drug interaction.
<b>PYB-410 P</b>	<b>Project Report</b>	Students shall have an understanding of literature review, scientific writing and presentation skills.
<b>PYB-412 T</b>	<b>Professional Training</b>	Students shall have an understanding of drug dispensing, patient counseling and industrial scale manufacturing and quality control methods for drug product.