



JAYAMUKHI EDUCATIONAL SOCIETY

**JAYAMUKHI COLLEGE OF PHARMACY**

(Approved by AICTE & PCI, New Delhi & affiliated to Kakatiya University, Warangal, T.S)  
NARSAMPET, Dist. Warangal - 506 332, (T.S)

## CRITERION 1 – CURRICULAR ASPECTS

### 1.3 Curriculum Enrichment

**1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum**

### INDEX SHEET

S. No	Content
1.	List and Description of courses addressing cross cutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability



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**Courses which address the Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum**

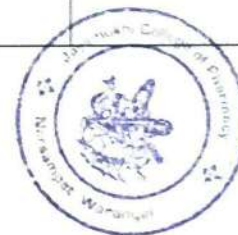
## B. PHARMACY

Course code	Name of the course	Professional Ethics	Gender	Human Values	Environment and Sustainability
BP102T	Pharmaceutical Analysis I – Theory			<ul style="list-style-type: none"><li>▪ Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures</li><li>▪ Pharmacopoeia, sources of impurities in medicinal agents, limit tests</li></ul>	
BP103T	Pharmaceutics I – Theory		<ul style="list-style-type: none"><li>▪ Pediatric dose calculations based on age, body weight and bod surface area</li></ul>	<ul style="list-style-type: none"><li>▪ Handling of Prescription and Errors in prescription</li></ul>	
BP104T	Pharmaceutical			<ul style="list-style-type: none"><li>▪ History of</li></ul>	<ul style="list-style-type: none"><li>▪ Radio activity,</li></ul>



  
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	Inorganic Chemistry - Theory			Pharmacopoeia, Sources and types of impurities, principle involved in the limit test for Chloride, Sulphate, Iron, Arsenic, Lead and Heavy metals, modified limit test for Chloride and Sulphate	Measurement of radioactivity, Properties of $\alpha$ , $\beta$ , $\gamma$ radiations, Half life, radio isotopes and study of radio isotopes - Sodium iodide $I_{131}$ , Storage conditions, precautions & pharmaceutical application of radioactive substances.
BP106RB T	Remedial Biology		<ul style="list-style-type: none"> <li>▪ Human reproduction</li> <li>▪ Parts of female reproductive system</li> <li>▪ Parts of male reproductive system</li> <li>▪ Spermatogenesis and Oogenesis</li> <li>▪ Menstrual cycle</li> </ul>	<ul style="list-style-type: none"> <li>▪ Definition and characters of living organisms</li> <li>▪ Diversity in the living world</li> <li>▪ Binomial nomenclature</li> <li>▪ Five kingdoms of life and basis of classification. Salient features of Monera, Protista, Fungi, Animalia and Plantae, Virus</li> </ul>	
BP106RM T	Remedial Mathematics	<ul style="list-style-type: none"> <li>▪ Application of Partial Fraction in Chemical</li> </ul>			



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		Kinetics and Pharmacokinetics			
BP107P	Human Anatomy and Physiology – Practical			<ul style="list-style-type: none"> <li>▪ Enumeration of total red blood corpuscles (RBC) count</li> <li>▪ Determination of bleeding time</li> <li>▪ Determination of clotting time</li> <li>▪ Estimation of hemoglobin content</li> <li>▪ Determination of blood group.</li> <li>▪ Determination of erythrocyte sedimentation rate (ESR).</li> <li>▪ Determination of heart rate and pulse rate.</li> <li>▪ Recording of blood pressure.</li> </ul>	
BP201T	Human Anatomy and Physiology II – Theory	<ul style="list-style-type: none"> <li>▪ Formation and role of ATP, Creatinine Phosphate and BMR</li> <li>▪ Chromosomes, genes and DNA, protein synthesis, genetic pattern of inheritance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Anatomy of male and female reproductive system, functions of male and female reproductive system, sex hormones, physiology of</li> </ul>		




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			menstruation, fertilization, spermatogenesis, oogenesis, pregnancy and parturition		
BP203T	Biochemistry – Theory	<ul style="list-style-type: none"> <li>▪ Biological significances of ATP and cyclic AMP</li> <li>▪ Hormonal regulation of blood glucose level and Diabetes mellitus</li> </ul>			
BP204T	Pathophysiology – Theory	<ul style="list-style-type: none"> <li>▪ Study of Pathophysiology; signs and symptoms of the diseases of Endocrine system, Nervous system, Gastrointestinal, Haematological Diseases</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sexually transmitted diseases: AIDS, Syphilis, Gonorrhoea</li> </ul>		
BP205T	Computer Applications in Pharmacy – Theory	<ul style="list-style-type: none"> <li>▪ Patient Monitoring System</li> <li>▪ Impact of Bioinformatics in Vaccine Discovery</li> <li>▪ Computers as data analysis in Preclinical development</li> </ul>			
BP206T	Environmental sciences – Theory				COMPLETE SUBJECT OF SYLLABUS *
BP207P	Human Anatomy and Physiology II	<ul style="list-style-type: none"> <li>▪ Study of family planning devices and pregnancy</li> </ul>		<ul style="list-style-type: none"> <li>▪ Determination of tidal volume and vital</li> </ul>	



  
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	-Practical	<p>diagnosis test</p> <ul style="list-style-type: none"> <li>▪ Demonstration of total blood count by cell analyser</li> <li>▪ Permanent slides of vital organs and gonads</li> </ul>		<p>capacity</p> <ul style="list-style-type: none"> <li>▪ Study of digestive, respiratory, cardiovascular systems, urinary and reproductive systems with the help of models, charts and specimens</li> <li>▪ Recording of basal mass index</li> </ul>	
BP209P	Biochemistry – Practical	<ul style="list-style-type: none"> <li>▪ Qualitative analysis of urine for abnormal constituents</li> <li>▪ Determination of blood creatinine</li> <li>▪ Determination of blood sugar</li> <li>▪ Determination of serum total cholesterol</li> </ul>			
BP210P	Computer Applications in Pharmacy – Practical*	<ul style="list-style-type: none"> <li>▪ Design a form in MS Access to view, add, delete and modify the patient record in the database</li> </ul>			
BP301T	Pharmaceutical Organic Chemistry II – Theory	<ul style="list-style-type: none"> <li>▪ Analytical constants – Acid value, Saponification value, Ester value, Iodine value, Acetyl value, Reichert</li> </ul>			



  
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		Meissl (RM) value – significance and principle involved in their determination.			
BP303T	Pharmaceutical Microbiology – Theory	<ul style="list-style-type: none"> <li>▪ Sterility testing of products (solids, liquids, ophthalmic and other sterile products) according to IP, BP and USP.</li> <li>▪ Assessment of a new antibiotic.</li> <li>▪ Application of cell cultures in pharmaceutical industry and research.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Study of morphology, classification, reproduction/replication and cultivation of Fungi and Viruses.</li> </ul>		
BP304T	Pharmaceutical Engineering – Theory				<ul style="list-style-type: none"> <li>▪ Factors affecting during materials selected for pharmaceutical plant construction, Theories of corrosion, types of corrosion and there prevention. Ferrous and nonferrous metals, inorganic and organic nonmetals, basic of material handling systems.</li> </ul>
BP305P	Pharmaceutical Organic	<ul style="list-style-type: none"> <li>▪ Determination of following oil values (including</li> </ul>			



  
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	Chemistry II – Practical	<ul style="list-style-type: none"> <li>standardization of reagents)</li> <li>▪ Acid value</li> <li>▪ Saponification value</li> <li>▪ Iodine value</li> </ul>			
BP307P	Pharmaceutical Microbiology – Practical	<ul style="list-style-type: none"> <li>▪ Microbiological assay of antibiotics by cup plate method and other methods</li> <li>▪ Sterility testing of pharmaceutical</li> <li>▪ Bacteriological analysis of water</li> <li>▪ Biochemical test</li> </ul>			
BP401T	Pharmaceutical Organic Chemistry III– Theory	<ul style="list-style-type: none"> <li>▪ Stereospecific and stereoselective reactions</li> </ul>			
BP403T	Physical Pharmaceutics II – Theory	<ul style="list-style-type: none"> <li>▪ Accelerated stability testing in expiration dating of pharmaceutical dosage forms. Photolytic degradation and its prevention</li> </ul>			<ul style="list-style-type: none"> <li>▪ Reaction kinetics: zero, pseudo-zero, first &amp; second order, units of basic rate constants, determination of reaction order. Physical and chemical factors influencing the chemical degradation of pharmaceutical product: temperature, solvent,</li> </ul>

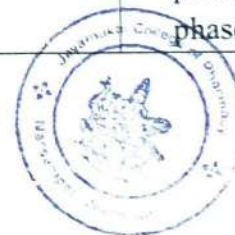


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					ionic strength, dielectric constant, specific & general acid base catalysis, Simple numerical problems. Stabilization of medicinal agents against common reactions like hydrolysis & oxidation.
BP404T	Pharmacology I – Theory			<ul style="list-style-type: none"> <li>▪ Addiction, tolerance, dependence, tachyphylaxis, idiosyncrasy, allergy</li> <li>▪ Adverse drug reactions.</li> <li>▪ Drug interactions (pharmacokinetic and pharmacodynamic)</li> <li>▪ Drug discovery and clinical evaluation of new drugs. Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of</li> </ul>	



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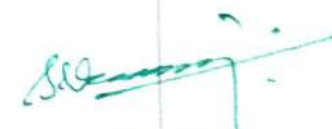
				clinical trials and pharmacovigilance. <ul style="list-style-type: none"> <li>▪ Alcohols and disulfiram</li> <li>▪ Drug addiction, drug abuse, tolerance and dependence</li> </ul>	
BP405T	Pharmacognosy and Phytochemistry I- Theory	<ul style="list-style-type: none"> <li>▪ Edible vaccines</li> <li>▪ Role of Pharmacognosy in allopathy and traditional systems of medicine namely, Ayurveda, Unani, Siddha, Homeopathy and Chinese systems of medicine.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adulteration of drugs of natural origin. Evaluation by organoleptic, microscopic, physical, chemical and biological methods and properties.</li> <li>▪ Quantitative microscopy of crude drugs including lycopodium spore method, leaf constants, camera lucida and diagrams of microscopic objects to scale with camera lucida.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Definition, history, scope and development of Pharmacognosy</li> <li>▪ Sources of Drugs – Plants, Animals, Marine &amp; Tissue culture</li> <li>▪ Study of biological source, chemical nature and uses of drugs of natural origin containing following drugs</li> </ul>
BP406P	Medicinal Chemistry I –	<ul style="list-style-type: none"> <li>▪ Determination of Partition coefficient for any two</li> </ul>			

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	Practical	drugs			
BP408P	Pharmacology I – Practical	▪			▪ Maintenance of laboratory animals as per CPCSEA guidelines
BP409P	Pharmacognosy and Phytochemistry I – Practical	<ul style="list-style-type: none"> <li>▪ Determination of Fiber length and width</li> <li>▪ Determination of number of starch grains by Lycopodium spore method</li> <li>▪ Determination of Ash value</li> <li>▪ Determination of Extractive values of crude drugs</li> <li>▪ Determination of moisture content of crude drugs</li> <li>▪ Determination of swelling index and foaming</li> </ul>			
BP501T	Medicinal Chemistry II – Theory		<ul style="list-style-type: none"> <li>▪ Nomenclature, Stereochemistry and metabolism of steroids</li> <li>▪ Sex hormones: Testosterone, Nandralone, Progesterones, Oestriol, Oestradiol, Oestrione, Diethyl stilbestrol.</li> <li>▪ Drugs for erectile</li> </ul>		

  
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			dysfunction: Sildenafil, Tadalafil. <ul style="list-style-type: none"> <li>▪ Oral contraceptives:              Mifepristone,              Norgestrel,              Levonorgestrol</li> <li>▪ Corticosteroids:              Cortisone,              Hydrocortisone,              Prednisolone,              Betamethasone,              Dexamethasone</li> </ul>		
BP502T	Industrial Pharmacy-I Theory				<ul style="list-style-type: none"> <li>▪ Application of preformulation considerations in the development of solid, liquid oral and parenteral dosage forms and its impact on stability of dosage forms.</li> <li>▪ Materials used for packaging of pharmaceutical products, factors influencing choice of containers, legal and official requirements</li> </ul>




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					for containers, stability aspects of packaging materials, quality control tests.
BP503T	Pharmacology II – Theory	<ul style="list-style-type: none"> <li>▪ Bioassay of insulin, oxytocin, vasopressin, ACTH, d-tubocurarine, digitalis, histamine and 5-HT</li> </ul>	<ul style="list-style-type: none"> <li>▪ Androgens and Anabolic steroids.</li> <li>▪ Estrogens, progesterone and oral contraceptives.</li> <li>▪ Drugs acting on the uterus.</li> </ul>		
BP504T	Pharmacognosy and Phytochemistry II– Theory				<ul style="list-style-type: none"> <li>▪ Study of utilization of radioactive isotopes in the investigation of Biogenetic studies.</li> </ul>
BP505T	Pharmaceutical Jurisprudence – Theory				COMPLETE SUBJECT OF SYLLABUS *
BP506P	Industrial Pharmacy-I Practical	<ul style="list-style-type: none"> <li>▪ Preformulation studies on paracetamol/aspirin/or any other drug</li> <li>▪ Preparation and evaluation of Paracetamol tablets</li> <li>▪ Preparation and evaluation of Aspirin tablets</li> <li>▪ Coating of tablets- film coating of tables/granules</li> <li>▪ Preparation and evaluation</li> </ul>			




  
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		<ul style="list-style-type: none"> <li>of Tetracycline capsules</li> <li>▪ Preparation of Calcium Gluconate injection</li> <li>▪ Preparation of Ascorbic Acid injection</li> <li>▪ Quality control test of (as per IP) marketed tablets and capsules</li> <li>▪ Preparation of Eye drops/ and Eye ointments</li> <li>▪ Preparation of Creams (cold / vanishing cream)</li> <li>▪ Evaluation of Glass containers (as per IP)</li> </ul>			
BP601T	Medicinal Chemistry III – Theory	<ul style="list-style-type: none"> <li>▪ Concept and applications chemistry: solid phase and solution phase synthesis</li> </ul>			
BP602T	Pharmacology III – Theory		<ul style="list-style-type: none"> <li>▪ Definition and basic knowledge of genotoxicity, carcinogenicity, teratogenicity and mutagenicity</li> </ul>		
BP603T	Herbal Drug Technology – Theory	<ul style="list-style-type: none"> <li>▪ Good Manufacturing Practice of Indian systems of medicine</li> <li>▪ Evaluation of Drugs: WHO &amp; ICH guidelines for the</li> </ul>		 <b>Principal</b> Jayamukhi College of Pharmacy Narsampet-506 332	<ul style="list-style-type: none"> <li>▪ Herbal drugs industry: Present scope and future prospects.</li> <li>▪ A brief account of plant based industries and</li> </ul>



		<p>assessment of herbal drugs</p> <p>Stability testing of herbal drugs</p> <ul style="list-style-type: none"> <li>▪ Patenting and Regulatory requirements of natural products</li> <li>▪ Regulations in India (ASU DTAB, ASU DCC), Regulation of manufacture of ASU drugs - Schedule Z of Drugs &amp; Cosmetics Act for ASU drugs</li> </ul>			<p>institutions involved in work on medicinal and aromatic plants in India.</p> <ul style="list-style-type: none"> <li>▪ Good agricultural practices in cultivation of medicinal plants including Organic farming.</li> <li>▪ Pest and Pest management in medicinal plants: Biopesticides/Bioinsecticides</li> </ul>
BP604T	Biopharmaceutics and Pharmacokinetics – Theory		<ul style="list-style-type: none"> <li>▪ Factors influencing drug absorption</li> </ul>		
BP605T	Pharmaceutical Biotechnology – Theory	<ul style="list-style-type: none"> <li>▪ Biosensors- Working and applications of biosensors in Pharmaceutical Industries</li> <li>▪ Brief introduction to PCR</li> <li>▪ General method of the preparation of bacterial vaccines, toxoids, viral vaccine, antitoxins, serum-</li> </ul>		<ul style="list-style-type: none"> <li>▪ Use of microbes in industry.</li> </ul>	



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		<p>immune blood derivatives and other products relative to immunity</p> <ul style="list-style-type: none"> <li>▪ Immuno blotting techniques- ELISA, Western blotting, Southern blotting</li> </ul>			
BP606T	Quality Assurance – Theory	<ul style="list-style-type: none"> <li>▪ Quality Assurance and Quality Management concepts</li> <li>▪ Total Quality Management (TQM)</li> <li>▪ ICH Guidelines</li> <li>▪ Quality by design (QbD)</li> <li>▪ ISO 9000 &amp; ISO14000</li> <li>▪ NABL accreditation</li> </ul>			<ul style="list-style-type: none"> <li>▪ Organization and personnel: Personnel responsibilities, training, hygiene and personal records.</li> <li>▪ Premises: Design, construction and plant layout, maintenance, sanitation, environmental</li> <li>▪ control, utilities and maintenance of sterile areas, control of contamination.</li> <li>▪ Equipments and raw materials: Equipment selection, purchase specifications, maintenance.</li> </ul>



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					<ul style="list-style-type: none"> <li>purchase specifications and maintenance of stores for raw materials.</li> </ul>
BP607P	Medicinal chemistry III – Practical	<ul style="list-style-type: none"> <li>Preparation of medicinally important compounds or intermediates by Microwave irradiation technique</li> </ul>			
BP609P	Herbal Drug Technology – Practical	<ul style="list-style-type: none"> <li>Evaluation of excipients of natural origin</li> </ul>			
BP701T	Instrumental Methods of Analysis – Theory				
BP702T	Industrial Pharmacy-II Theory	<ul style="list-style-type: none"> <li>Technology development and transfer</li> <li>Regulatory affairs</li> <li>Regulatory requirements for drug approval</li> <li>Quality management systems</li> <li>Indian Regulatory Requirements</li> </ul>			<ul style="list-style-type: none"> <li>space requirements, raw materials, Pilot plant scale up considerations for solids, liquid orals, semi solids and relevant documentation, SUPAC guidelines, Introduction to platform technology</li> </ul>
BP703T	Pharmacy Practice – Theory			COMPLETE SUBJECT OF SYLLABUS *	
BP704T	Novel Drug Delivery System	<ul style="list-style-type: none"> <li>Definition, advantages and disadvantages,</li> </ul>			



  
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	- Theory	<p>microspheres /microcapsules, microparticles, methods of microencapsulation, applications</p> <ul style="list-style-type: none"> <li>Introduction, Principles of bioadhesion / mucoadhesion, concepts, advantages and disadvantages, transmucosal permeability and formulation considerations of buccal delivery systems</li> </ul>			
BP802T	Social and Preventive Pharmacy			COMPLETE SUBJECT OF SYLLABUS *	
BP803ET	Pharma Marketing Management	<ul style="list-style-type: none"> <li>Product decision: Classification, product line and product mix decisions, product life cycle, product portfolio analysis; product positioning; New product decisions; Product branding, packaging and labeling decisions, Product management in pharmaceutical industry</li> </ul>			



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		<ul style="list-style-type: none"> <li>▪ Promotion: Methods, determinants of promotional mix, promotional budget; An overview of personal selling, advertising, direct mail, journals, sampling, retailing, medical exhibition, public relations, online promotional techniques for OTC Products.</li> <li>▪ Pricing: Meaning, importance, objectives, determinants of price; pricing methods and strategies, issues in price management in pharmaceutical industry. An overview of DPCO (Drug Price Control Order) and NPPA (National Pharmaceutical Pricing Authority).</li> </ul>			
BP804ET	Pharmaceutical Regulatory Science	COMPLETE SUBJECT OF SYLLABUS *			<p style="text-align: right;"><i>[Signature]</i></p> <p style="text-align: right;">Principal Jayamukhi College of Pharmacy Narsampet-506 332</p>
BP805ET	Pharmacovigilance	▪ Drug and disease	▪ Drug safety	Importance of safety	




	e	<p>classification</p> <ul style="list-style-type: none"> <li>▪ Drug dictionaries and coding in pharmacovigilance</li> <li>▪ Information resources in pharmacovigilance</li> <li>▪ Establishing pharmacovigilance programme</li> <li>▪ Safety data generation</li> <li>▪ ICH Guidelines for Pharmacovigilance</li> </ul>	<p>evaluation in special population</p> <ul style="list-style-type: none"> <li>▪ Paediatrics</li> <li>▪ Pregnancy and lactation</li> <li>▪ • Geriatrics</li> </ul>	<p>monitoring of Medicine</p> <p>WHO international drug monitoring programme</p> <p>Pharmacovigilance Program of India(PvPI)</p> <p>Vaccine safety surveillance</p> <ul style="list-style-type: none"> <li>• Vaccine</li> </ul> <p>Pharmacovigilance</p> <ul style="list-style-type: none"> <li>• Vaccination failure</li> <li>• Adverse events following immunization</li> </ul>	
BP806ET	Quality Control and Standardization of Herbals	<ul style="list-style-type: none"> <li>▪ Basic tests for drugs – Pharmaceutical substances, Medicinal plants materials and dosage forms</li> <li>▪ WHO guidelines for quality control of herbal drugs. Evaluation of commercial crude drugs intended for use</li> <li>▪ Quality assurance in herbal drug industry of cGMP, GAP, GMP and GLP in traditional system of medicine.</li> <li>▪ WHO Guidelines on current</li> </ul>			<ul style="list-style-type: none"> <li>▪ Stability testing of herbal medicines.</li> <li>▪ Application of various chromatographic techniques in standardization of herbal products.</li> </ul>

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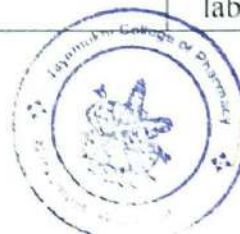
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		<p>good manufacturing Practices (cGMP) for Herbal Medicines WHO Guidelines on GACP for Medicinal Plants.</p> <ul style="list-style-type: none"> <li>▪ EU and ICH guidelines for quality control of herbal drugs.</li> <li>▪ Regulatory requirements for herbal medicines.</li> <li>▪ WHO guidelines on safety monitoring of herbal medicines in pharmacovigilance systems.</li> <li>▪ Role of chemical and biological markers in standardization of herbal products</li> </ul>			
BP807ET	Computer Aided Drug Design	<ul style="list-style-type: none"> <li>▪ Drug Discovery and Development</li> <li>▪ Quantitative Structure Activity Relationship (QSAR)</li> <li>▪ Molecular Modeling and virtual screening techniques</li> <li>▪ Informatics &amp; Methods in drug design</li> <li>▪ Molecular Modeling</li> </ul>			

  
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BP808ET	Cell and Molecular Biology		<ul style="list-style-type: none"> <li>▪ Cell and Molecular Biology: Definitions theory and basics and Applications.</li> <li>▪ Cell and Molecular Biology: History and Summation.</li> <li>▪ Properties of cells and cell membrane.</li> <li>▪ Prokaryotic versus Eukaryotic</li> <li>▪ e) Cellular Reproduction</li> </ul>		
BP809ET	Cosmetic Science	<ul style="list-style-type: none"> <li>▪ Principles of formulation and building blocks of skin care products</li> <li>▪ Principles of formulation and building blocks of Hair care products</li> <li>▪ Analytical cosmetics</li> <li>▪ Principles of Cosmetic Evaluation</li> </ul>		<ul style="list-style-type: none"> <li>▪ Cosmetic problems associated with Hair and scalp</li> <li>▪ Cosmetic problems associated with skin</li> </ul>	<ul style="list-style-type: none"> <li>▪ Role of herbs in cosmetics</li> </ul>
BP810ET	Pharmacological Screening Methods	<ul style="list-style-type: none"> <li>▪ Selection of research topic, review of literature, research hypothesis and study design</li> <li>▪ Pre-clinical data analysis and interpretation using</li> </ul>		<ul style="list-style-type: none"> <li>▪ Study of CPCSEA and OECD guidelines for maintenance, breeding and conduct of experiments on laboratory animals</li> </ul>	



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		<p>Students 't' test  <ul style="list-style-type: none"> <li>and One-way ANOVA.</li> </ul> Graphical representation of data</p>		<ul style="list-style-type: none"> <li>Common lab animals. Description and applications of different species and strains of animals. Popular transgenic and mutant animals.</li> <li>Techniques for collection of blood and common routes of drug administration in laboratory animals</li> <li>Techniques of blood collection and euthanasia.</li> <li>Preclinical screening models</li> </ul>	
BP811ET	Advanced Instrumentation Techniques	<ul style="list-style-type: none"> <li>Calibration and validation- as per ICH and USFDA guidelines</li> <li>Calibration of following Instruments</li> <li>Electronic balance, UV-Visible spectrophotometer, IR spectrophotometer, Fluorimeter, Flame Photometer, HPLC and GC</li> </ul>			<ul style="list-style-type: none"> <li>Radio immune assay: Importance, various components, Principle, different methods, Limitation and Applications of Radio immuno assay</li> </ul>
BP812ET	Dietary	<ul style="list-style-type: none"> <li>Effect of processing,</li> </ul>			<ul style="list-style-type: none"> <li>Phytochemicals as</li> </ul>



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	Supplements and Nutraceuticals	<p>storage and interactions of various environmental factors on the potential of nutraceuticals.</p> <ul style="list-style-type: none"> <li>▪ Regulatory Aspects; FSSAI, FDA, FPO, MPO, AGMARK, HACCP and GMPs on Food Safety. Adulteration of foods.</li> <li>▪ Pharmacopoeial Specifications for dietary supplements and nutraceuticals.</li> </ul>			<p>nutraceuticals: Occurrence and characteristic features</p>
	Elective course on Pharmaceutical Product Development	<ul style="list-style-type: none"> <li>▪ Optimization techniques in pharmaceutical product development. A study of various optimization techniques for pharmaceutical product development with specific examples. Optimization by factorial designs and their applications. A study of QbD and its application in pharmaceutical product development</li> <li>▪ Selection and quality control testing of packaging</li> </ul>			




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		materials for pharmaceutical product development- regulatory considerations			
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# JAYAMUKHI COLLEGE OF PHARMACY


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NARSAMPET, Dist. Warangal - 506 332, (T.S)


## Courses which address the Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum

### M. PHARMACY-PHARMACEUTICS


Course code	Name of the course	Professional Ethics	Gender	Human Values	Environment and Sustainability
BPP	Bio Pharmaceutics & Pharmacokinetics	<ul style="list-style-type: none"><li>Bio-availability, Bioequivalence and Therapeutic equivalence: Designing of bioavailability studies and interpretation of results.</li></ul>	<ul style="list-style-type: none"><li>Clinical Pharmacokinetics: Altered kinetics in pregnancy, child birth, infants and geriatrics, liver, and renal diseased states.</li></ul>		
PFT	Pharmaceutical Formulation Technology	<ul style="list-style-type: none"><li><b>Solid dosage forms:</b> Improved production techniques for tablets: New materials process, equipments improvements, high shear mixers, compression machines, coating machines, coating</li></ul>			



  
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		<p>techniques in tablet technology for product development , physics of tablet compression, computerization for in process quality control of tablets, types of tablets and their manufacture. Formulations, production and evaluation of hard and soft gelatin capsules.</p> <ul style="list-style-type: none"> <li>▪ <b>Powder dosage forms:</b> Formulation development and manufacture of powder dosage form for internal and external use including inhalations dosage forms.</li> <li>▪ <b>Liquid and Semi-solid dosage forms:</b> Recent advances in formulation aspects and manufacturing of monophasic dosage forms. Recent advances in formulation aspects and manufacturing of suspensions, dry syrups and semi-solid dosage forms.</li> <li>▪ <b>Parenteral dosage forms:</b> Advances in</li> </ul>			<p style="text-align: center;">   <b>Principal</b>  Jayamukh College of Pharmacy  Narsampet-506 332 </p>
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		<p>materials and production techniques, filling machines, sterilizers and aseptic processing. Manufacturing of small and large volume parenterals and quality control.</p> <ul style="list-style-type: none"> <li>▪ <b>Aerosols:</b> Advances in propellants, metered dose inhaler designs, dry powder inhalers, selection of containers and formulation aspects in aerosol formulation, Manufacture and quality control.</li> <li>▪ <b>Aseptic processing operation:</b> Introduction, contamination control, microbial environmental monitoring, microbiological testing of water, Microbiological air testing, characterization of aseptic process, media and incubation condition, theoretical evaluation of aseptic operations.</li> </ul>			
QAS	Quality Assurance	<ul style="list-style-type: none"> <li>▪ <b>Equipment Validation:</b> Installation, validation and maintenance of</li> </ul>			<p style="text-align: right;">   Principal  Jayamukhi College of Pharmacy  Narsampet-502332 </p> <p>Industrial Safety: Industrial hazards due to fire accidents, mechanical and</p>



		<p>typical equipment used in bulk manufacture of pharmaceutical dosage forms with reference to GMP requirement.</p> <ul style="list-style-type: none"> <li>Process Validation: Regulatory basis, validation of solid dosage forms, liquid dosage forms, and sterile products, Process validation of raw materials, validation of analytical methods.</li> <li>Stability studies: ICH guidelines and stability protocols for different pharmaceutical dosage forms.</li> </ul>			<p>electrical equipment, chemicals and pharmaceuticals. Monitoring and prevention systems.</p>
	Cosmetic Technology (Optional)	<ul style="list-style-type: none"> <li>Good Manufacturing Practices and Regulatory Requirements: Knowledge of the Regulatory Standards governing Cosmetic products in India as well as International Markets</li> </ul>		<p><i>S. Venkatesh</i></p> <p><b>Principal</b></p>	<ul style="list-style-type: none"> <li>Effects of environmental factors like light, temperatures etc., on product stability</li> </ul>

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## Courses which address the Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum

### M. PHARMACY-PHARMACOLOGY

Course code	Name of the course	Professional Ethics	Gender	Human Values	Environment and Sustainability
PE1	Advanced in Preclinical Evaluation - I	<ul style="list-style-type: none"><li>▪ Preclinical and clinical models employed in the screening of new drugs belonging to following categories.</li><li>▪ Drugs acting on Autonomic nervous system: Sympathomimetics, Parasympathomimetics, Anticholinesterases, anticholinergics, adrenolytics.</li><li>▪ Muscle relaxants (peripheral)</li><li>▪ Cardiovascular</li></ul>		<ul style="list-style-type: none"><li>▪ Care, handling and breeding techniques of laboratory animals. Regulations for laboratory animal care and ethical requirement. Knowledge of the CPCSEA</li><li>▪ proforma for performing experiments on animals.</li></ul>	



  
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		<p>Pharmacology: Cardiac glycosides, antiarrhythmics, antihypertensives, antiatherosclerotics .</p> <ul style="list-style-type: none"> <li>▪ Screening of free radical scavenging activity</li> <li>▪ Immunopharmacology: Specific (Cell and humoral mediated) and non-specific methods.</li> <li>▪ Drugs for metabolic disorders: Anti-diabetic agents, Hepatoprotective agents, Anti-hyperlipidemic agents</li> </ul>			
PPD	Pharmacokinetics Pharmacodynamics & Drug Metabolism (PPDM)	<p>Clinical Pharmacokinetics</p> <ul style="list-style-type: none"> <li>▪ Revision of basic concepts</li> <li>▪ Dose – response in man</li> <li>▪ Influence of renal and hepatic disease on pharmacokinetics</li> <li>▪ Therapeutic drug monitoring</li> <li>▪ v. Population pharmacokinetics</li> </ul>	<ul style="list-style-type: none"> <li>▪ Drug metabolism in placenta, fetus, new born and aged</li> <li>▪ Physiological and environmental factors, species, strain, sex, and age differences</li> </ul>		

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LPT	Clinical Pharmacology & Toxicology	<ul style="list-style-type: none"> <li>Guidelines and regulatory agencies – CPCSEA, OECD, FDA, ICH, FHSA,</li> <li>EPA, EEC, WHO etc.,</li> </ul>	<ul style="list-style-type: none"> <li>Drug therapy in special populations</li> <li>Geriatrics</li> <li>Pediatrics - neonate, infants &amp; adolescents</li> <li>C. Pregnancy &amp; Lactation</li> </ul>	<ul style="list-style-type: none"> <li>Physicochemical, Biochemical and genetic basis of toxicity, principles of toxicokinetics, mutagenesis and carcinogenesis</li> </ul>
PE2	Advanced In Preclinical Evaluation-II	<ul style="list-style-type: none"> <li>Preclinical evaluation of following categories of drugs.</li> <li>i. CNS Pharmacology: Sedatives, hypnotics, anxiolytics, antidepressants, Muscle relaxants (Central). CNS stimulations</li> <li>anticonvulsants, antipsychotics, Nootropics, antiparkinsonian agents,</li> <li>ii. Analgesics, antipyretics, anti-inflammatory agents and local anesthetics.</li> <li>ii. Gastrointestinal drugs: Antiulcer agents, laxatives</li> <li>iii. Respiratory pharmacology:</li> </ul>		

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		<ul style="list-style-type: none"> <li>▪ bronchodilators, antitussives,</li> <li>▪ iv. Diuretics</li> <li>▪ v. Histamine antagonists</li> <li>▪ vi. Reproductive pharmacology: antifertility agents</li> <li>▪ vii. Anticancer agents</li> </ul>			
CLR	Clinical Research	<ul style="list-style-type: none"> <li>▪ Ethics and Guidelines in Biomedical Research</li> <li>▪ Ethical Issues in Biomedical Research – Principles of ethics in biomedical research,</li> <li>▪ Ethical committee [institutional review board], its constitution and functions,</li> <li>▪ Good clinical practice [ICH GCP guidelines, CDSCO regulations, MPA, European, Japan, Health Canada and MHRA guidelines, schedule Y and USFDA in the conduct of clinical trials]</li> </ul>		<ul style="list-style-type: none"> <li>▪ Planning and execution of clinical trials, Various Phases of clinical trials</li> </ul>	

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## Courses which address the Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum

### PHARM. D

Course code	Name of the course	Professional Ethics	Gender	Human Values	Environment and Sustainability
1.1 T	Human Anatomy and Physiology – Theory	Drugs and athletics	<ul style="list-style-type: none"><li>▪ Reproductive system</li><li>1. Male and female reproductive system</li><li>2. Their hormones- Physiology of menstruation</li><li>3. Spermatogenesis &amp; Oogenesis</li><li>4. Sex determination (genetic basis)</li><li>5. Pregnancy and maintenance and parturition</li><li>6. Contraceptive devices</li></ul>		


  
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1.1 P	Human Anatomy and Physiology – Practical	<ul style="list-style-type: none"> <li>▪ Determination of W.B.C. count of blood.</li> <li>▪ Determination of R.B.C. count of blood.</li> <li>▪ Determination of differential count of blood.</li> <li>▪ Determination of (a) Erythrocyte Sedimentation Rate. (b) Hemoglobin content of Blood. (c) Bleeding time &amp; Clotting time.</li> <li>▪ Determination of (a) Blood Pressure. (b) Blood group.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Study of different family planning appliances.</li> <li>▪ To perform pregnancy diagnosis test.</li> </ul>		
1.2T	Pharmaceutics– Theory	<ul style="list-style-type: none"> <li>▪ Development of Indian Pharmacopoeia and introduction to other Pharmacopoeias such as BP, USP, European Pharmacopoeia, Extra pharmacopoeia and Indian national formulary.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Incompatibilities: Introduction, classification and methods to overcome the incompatibilities.</li> </ul>	
1.2P	Pharmaceutics– Practical			<ul style="list-style-type: none"> <li>▪ Incompatibilities               <ul style="list-style-type: none"> <li>a. Mixtures with Physical</li> <li>b. Chemical &amp; Therapeutic incompatibilities</li> </ul> </li> </ul>	<p style="text-align: right;"><i>A. R. ...</i></p> <p style="text-align: right;"><b>Principal</b></p>




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1.3T	Medicinal Biochemistry – Theory	<ul style="list-style-type: none"> <li>▪ Introduction to clinical chemistry: Cell; composition; malfunction; Roll of the clinical chemistry laboratory.</li> <li>▪ The kidney function tests: Role of kidney; Laboratory tests for normal function includes- a) Urine analysis (macroscopic and physical examination, quantitative and semiquantitative tests.) b) Test for NPN constituents. (Creatinine /urea clearance, determination of blood and urine creatinine, urea and uric acid) c) Urine concentration test d) Urinary tract calculi. (stones)</li> <li>▪ Liver function tests: Physiological role of liver, metabolic, storage, excretory, protective, circulatory functions and</li> </ul>			<p style="text-align: right;">   <b>Principal</b>  Jayamukhi College of Pharmacy  Narsampet-506 332 </p>
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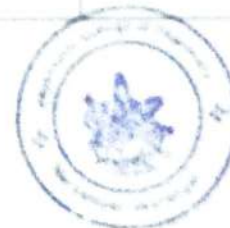
		<p>function in blood coagulation. a) Test for hepatic dysfunction-Bile pigments metabolism. b) Test for hepatic function test- Serum bilirubin, urine bilirubin, and urine urobilinogen. c) Dye tests of excretory function. d) Tests based upon abnormalities of serum proteins. Selected enzyme tests.</p> <ul style="list-style-type: none"> <li>▪ Lipid profile tests: Lipoproteins, composition, functions. Determination of serum lipids, total cholesterol, HDL cholesterol, LDL cholesterol and triglycerides.</li> <li>▪ Immunochemical techniques for determination of hormone levels and protein levels in serum for endocrine diseases and infectious diseases.</li> </ul>			<p style="text-align: right;">   <b>Principal</b>  Jayamukhi College of Pharmacy  Narsampet-506 332 </p>
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1.3T	Medicinal Biochemistry – Practical	<ul style="list-style-type: none"> <li>▪ Qualitative analysis of normal constituents of urine</li> <li>▪ Qualitative analysis of abnormal constituents of urine</li> <li>▪ Quantitative estimation of urine sugar by Benedict's reagent method</li> <li>▪ Quantitative estimation of urine chlorides by Volhard's method</li> <li>▪ Quantitative estimation of urine creatinine by Jaffe's method</li> <li>▪ Quantitative estimation of urine calcium by precipitation method</li> <li>▪ Quantitative estimation of serum cholesterol by Libermann Burchard's method</li> <li>▪ Preparation of Folin Wu filtrate from blood</li> <li>▪ Quantitative estimation of blood creatinine.</li> <li>▪</li> <li>▪ Quantitative estimation of</li> </ul>			<p style="text-align: right;">   <b>Principal</b>  Jayamukhi College of Pharmacy,  Narsampet-506 322 </p>
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		<p>blood sugar Folin-Wu tube method</p> <ul style="list-style-type: none"> <li>▪ Estimation of SGOT in serum</li> <li>▪ Estimation of SGPT in serum</li> <li>▪ Estimation of Urea in Serum</li> <li>▪ Estimation of Proteins in Serum</li> <li>▪ Determination of serum bilirubin</li> <li>▪ Determination of Glucose by means of Glucoseoxidase</li> <li>▪ Study of factors affecting Enzyme activity (pH &amp; Temp)</li> <li>▪ Experiment on lipid profile tests</li> <li>▪ Determination of sodium, calcium and potassium in serum.</li> </ul>			
1.5T	Pharmaceutical Inorganic Chemistry - Theory			<ul style="list-style-type: none"> <li>• Errors</li> </ul>	<ul style="list-style-type: none"> <li>• Radio Pharmaceuticals</li> </ul>



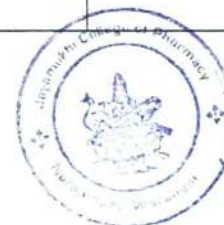
  
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2.1 T	Pathophysiology			<ul style="list-style-type: none"> <li>▪ Chemical Mediators of inflammation</li> <li>▪ Drug Hypersensitivity</li> <li>▪ Cigarette smoking &amp; its ill effects</li> <li>▪ Biological Effects of Radiation</li> <li>▪ Etiology and hazards of obesity</li> <li>▪ Complications of diabetes</li> <li>▪ Diagnosis of cancer</li> <li>▪ Disorders of vitamins</li> <li>▪ Methods in Pathology- Laboratory values of clinical significance</li> <li>▪ Pathophysiology of Dengue Haemorrhagic Fever (DHF)</li> <li>▪ Pathophysiology of common diseases</li> </ul>	<ul style="list-style-type: none"> <li>▪ Biological effects of radiation</li> <li>▪ Environmental and nutritional diseases i) Air pollution and smoking- SO<sub>2</sub>, NO, NO<sub>2</sub>, and CO ii) Protein calorie malnutrition, vitamins, obesity, pathogenesis of starvation.</li> </ul>
2.2T	Pharmaceutical Microbiology- Theory	<ul style="list-style-type: none"> <li>▪ Disinfectants- Study of disinfectants, antiseptics, fungicidal and virucidal agents factors affecting their activation and mechanism of action. Evaluation of bactericidal, bacteristatic, virucidal activities, evaluation of preservatives in</li> </ul>		<ul style="list-style-type: none"> <li>▪ Study of infectious diseases: Typhoid, Tuberculosis, Malaria, Cholera, Hepatitis, Meningitis, Syphilis &amp; Gonorrhoea and HIV.</li> </ul>	

  
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		<p>pharmaceutical preparations.</p> <ul style="list-style-type: none"> <li>▪ Diagnostic tests : Schick's Test, Elisa test, Western Blot test, Southern Blot PCR Widal, QBC, Mantoux Peripheral smear. Study of malarial parasite.</li> </ul>			
2.2P	Pharmaceutical Microbiology- Practical	<ul style="list-style-type: none"> <li>▪ Microbiological assay of antibiotics by cup plate method.</li> <li>▪ Microbiological assay of vitamins by Turbidometric method</li> </ul>		<ul style="list-style-type: none"> <li>▪ Diagnostic tests for some common diseases, Widal, malarial parasite</li> </ul>	
2.3T	Pharmacognosy & Phytopharmaceuticals - Theory			<ul style="list-style-type: none"> <li>▪ Different methods of adulteration of crude drugs</li> </ul>	Study of natural pesticides
2.4 T	Pharmacology-I - Theory		<ul style="list-style-type: none"> <li>▪ Sex hormones and oral contraceptives</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-clinical evaluations</li> <li>▪ Drug interactions</li> </ul>	
2.5 T	Community Pharmacy - Theory			<ul style="list-style-type: none"> <li>▪ COMPLETE SYLLABUS*</li> </ul>	
2.6 T	Pharmacotherapeutics-I -		<ul style="list-style-type: none"> <li>▪ General prescribing guidelines for a.</li> </ul>		

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	Theory		Paediatric patients b. Geriatric patients c. Pregnancy and breast feeding		
3.1 T	Pharmacology-II – Theory			<ul style="list-style-type: none"> <li>Study of laboratory animals and their handling (a. Frogs, b. Mice, c. Rats, d. Guinea pigs, e. Rabbits).</li> </ul>	The gene sequencing, mapping and cloning of human disease genes
3.2 T	Pharmaceutical Analysis – Theory	<ul style="list-style-type: none"> <li>GLP, ISO 9000.</li> <li>Total quality management, quality review and documentation.</li> <li>ICH- international conference for harmonization-guidelines.</li> <li>Regulatory control.</li> </ul>			
3.3 T	Pharmacotherapeutics- II – Theory	<ul style="list-style-type: none"> <li></li> </ul>		<ul style="list-style-type: none"> <li>Guidelines for the rational use of antibiotics and surgical Prophylaxis, Tuberculosis, Meningitis, Respiratory tract infections, Gastroenteritis, Endocarditis, Septicemia, Urinary tract infections, Protozoal infection</li> </ul>	 <b>Principal</b> Jayamukhi College of Pharmacy Narsampet-506 332



				Malaria, HIV & Opportunistic infections, Fungal infections, Viral infections, Gonorrhoea and Syphilis	
3.4 T	Pharmaceutical Jurisprudence	▪ COMPLETE SUBJECT*			
3.6 T	Pharmaceutical Formulation	▪ Preparation of pharmaceutical formulation and evaluation of pharmaceutical dosage forms			
4.1 T	Pharmacotherapeutics- III – Theory			▪ Psychiatry disorders: Schizophrenia, Affective disorders, Anxiety disorders, Sleep disorders, Obsessive Compulsive disorders	
4.2 T	Hospital Pharmacy – Theory	▪ Hospital drug policy a) Pharmacy and Therapeutic committee (PTC) b) Hospital formulary c) Hospital committees - Infection committee - Research and ethical committee d) developing therapeutic guidelines e) Hospital pharmacy		▪ Roles & responsibilities of hospital pharmacist	▪ Radio Pharmaceuticals – Handling and packaging

  
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		<ul style="list-style-type: none"> <li>communication – Newsletter</li> <li>▪ Continuing professional development programs</li> <li>Education and training</li> <li>▪ Manufacture of Pharmaceutical preparations</li> </ul>			
4.2 P	Hospital Pharmacy – Practical	<ul style="list-style-type: none"> <li>▪ Pharmacy and Therapeutics committee – Organization, functions, and limitations</li> <li>▪ Evaluation of prescriptions generated in hospital for drug interactions and find out the suitable management</li> </ul>			
4.3T	Clinical Pharmacy – Theory	<ul style="list-style-type: none"> <li>▪ Introduction to daily activities of a clinical pharmacist a. Drug therapy monitoring (medication chart review, clinical review, pharmacist interventions) b. Ward round participation c. Adverse drug reaction management d. Drug information and poisons information e. Medication history f. Patient</li> </ul>		<ul style="list-style-type: none"> <li>▪ Patient data analysis The patient's case history, its structure and use in evaluation of drug therapy &amp; Understanding common medical abbreviations and terminologies used in clinical practices.</li> <li>▪ Drug &amp; Poison information a. Introduction to drug information resources available b. Systematic approach</li> </ul>	 <b>Principal</b> Jayamukhi College of Pharmacy Narsampet-506 332



		<p>counseling g. Drug utilisation evaluation (DUE) and review (DUR)</p> <p>h. Quality assurance of clinical pharmacy services</p> <ul style="list-style-type: none"> <li>▪ Clinical laboratory tests used in the evaluation of disease states, and interpretation of test results</li> </ul>		<p>in answering DI queries c. Critical evaluation of drug information and literature d. Preparation of written and verbal reports e. Establishing a Drug Information Centre f. Poisons information-organization &amp; information resources</p>	
4.3 P	Clinical Pharmacy – Theory	<ul style="list-style-type: none"> <li>▪ Answering drug information questions</li> <li>▪ Patient medication counselling</li> <li>▪ Case studies related to laboratory investigations</li> <li>▪ Patient medication history interview</li> </ul>			
4.5 P	Biopharmaceutics And Pharmacokinetics – Practical	<ul style="list-style-type: none"> <li>▪ Determination of renal clearance</li> <li>▪ Studying metabolic pathways for different drugs based on elimination kinetics data.</li> <li>▪ Calculation of elimination half-life for different drugs by using urinary elimination data and blood</li> </ul>			



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		level data.			
4.6 T	Clinical Toxicology			<ul style="list-style-type: none"> <li>▪ Clinical symptoms and management of acute poisoning with the following agents               <ul style="list-style-type: none"> <li>a) Pesticide poisoning: organophosphorous compounds, carbamates, organochlorines, pyrethroids. b) Opiates overdose. c) Antidepressants d) Barbiturates and benzodiazepines. e) Alcohol: ethanol, methanol. f) Paracetamol and salicylates. g) Non-steroidal anti-inflammatory drugs. h) Hydrocarbons: Petroleum products and PEG. i) Caustics: inorganic acids and alkali. j) Radiation poisoning</li> </ul> </li> <li>▪ Substance abuse: Signs and symptoms of substance abuse and treatment of</li> </ul>	<ul style="list-style-type: none"> <li>▪ Venomous snake bites: Families of venomous snakes, clinical effects of venoms, general management as first aid, early manifestations, complications and snake bite injuries.</li> <li>▪ Plants poisoning. Mushrooms, Mycotoxins.</li> <li>▪ Food poisonings</li> </ul>

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				dependence a) CNS stimulants :amphetamine b) Opioids c) CNS depressants d) Hallucinogens: LSD e) Cannabis group f) Tobacco	
5.1 T	Clinical Research	<ul style="list-style-type: none"> <li>▪ Good Clinical Practice – ICH, GCP, Central drug standard control organisation (CDSCO) guidelines</li> <li>▪ Ethical guidelines in Clinical Research</li> <li>▪ Designing of clinical study documents (protocol, CRF, ICF, PIC with assignment)</li> </ul>		<ul style="list-style-type: none"> <li>▪ Safety monitoring in clinical trials.</li> </ul>	
5.3 T	Clinical Pharmacokinetics and Pharmacotherapeutic Drug Monitoring	<ul style="list-style-type: none"> <li>▪ Therapeutic Drug monitoring</li> <li>▪ Dosage adjustment in Renal and hepatic Disease</li> <li>▪</li> </ul>			



  
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## **Courses which address the Professional Ethics into the Curriculum**

- B. Pharmacy: Pharmaceutical Jurisprudence (BP505T)
- Pharm.D: Pharmaceutical Jurisprudence (3.4)



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## BP 505 T. PHARMACEUTICAL JURISPRUDENCE (Theory)

45 Hours

**Scope:** This course is designed to impart basic knowledge on important legislations related to the profession of pharmacy in India.

**Objectives:** Upon completion of the course, the student shall be able to understand:

1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
2. Various Indian pharmaceutical Acts and Laws
3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
4. The code of ethics during the pharmaceutical practice

### Course Content:

#### UNIT-I

10 Hours

##### Drugs and Cosmetics Act, 1940 and its rules 1945:

Objectives, Definitions, Legal definitions of schedules to the Act and Rules

Import of drugs – Classes of drugs and cosmetics prohibited from import, Import under license or permit. Offences and penalties.

Manufacture of drugs – Prohibition of manufacture and sale of certain drugs,

Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license.

#### UNIT-II

10 Hours

##### Drugs and Cosmetics Act, 1940 and its rules 1945.

Detailed study of Schedule G, H, M, N, P, T, U, V, X, Y, Part XII B, Sch F & DMR (OA)

Sale of Drugs – Wholesale, Retail sale and Restricted license. Offences and penalties

Labeling & Packing of drugs- General labeling requirements and specimen labels for drugs and cosmetics, List of permitted colors. Offences and penalties.

Administration of the Act and Rules – Drugs Technical Advisory Board, Central drugs Laboratory, Drugs Consultative Committee, Government drug analysts, Licensing authorities, controlling authorities, Drugs Inspectors

#### UNIT-III

10 Hours

- **Pharmacy Act –1948** Objectives, Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils; constitution and functions, Registration of Pharmacists, Offences and



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## Penalties

- **Medicinal and Toilet Preparation Act 1955** Objectives, Definitions, Licensing, Manufacture In bond and Outside bond, Export of alcoholic preparations, Manufacture of Ayurvedic, Homeopathic, Patent & Proprietary Preparations Offences and Penalties.
- **Narcotic Drugs and Psychotropic substances Act-1985 and Rules** Objectives, Definitions, Authorities and Officers, Constitution and Functions of narcotic & Psychotropic Consultative Committee, National Fund for Controlling the Drug Abuse, Prohibition, Control and Regulation, opium poppy cultivation and production of poppy straw, manufacture, sale and export of opium, Offences and Penalties

## UNIT-IV

08 Hours

- **Study of Salient Features of Drugs and Magic Remedies Act and its rules:** Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties
- **Prevention of Cruelty to animals Act-1960:** Objectives, Definitions, Institutional Animal Ethics Committee, CPCSEA guidelines for Breeding and Stocking of Animals, Performance of Experiments, Transfer and acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties
- **National Pharmaceutical Pricing Authority:** Drugs Price Control Order (DPCO)-2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, National List of Essential Medicines (NLEM)

## UNIT-V

07 Hours

- **Pharmaceutical Legislations** – A brief review, Introduction, Study of drugs enquiry committee, Health survey and development committee, Hathi committee and Mudaliar committee
- **Code of Pharmaceutical ethics** Definition, Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath
- **Medical Termination of Pregnancy Act**
- **Right to Information Act**
- **Introduction to Intellectual Property Rights (IPR)**

### Recommended books: (Latest Edition)

I. Forensic Pharmacy by B. Suresh



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### 3.4 PHARMACEUTICAL JURISPRUDENCE (THEORY)

Theory : 2 Hrs. /Week

- 1. Scope of the Subject:** (4-6 lines): This course exposes the student to several important legislations related to the profession of pharmacy in India. The Drugs and Cosmetics Act, along with its amendments are the core of this course. Other acts, which are covered, include the Pharmacy Act, dangerous drugs, medicinal and toilet preparation Act etc. Besides this the new drug policy, professional ethics, DPCO, patent and design Act will be discussed.
- 2. Objectives of the Subject:** Upon completion of the subject student shall be able to (Know, do, and appreciate) –
  - a. practice the Professional ethics;
  - b. understand the various concepts of the pharmaceutical legislation in India;
  - c. know the various parameters in the Drug and Cosmetic Act and rules;
  - d. know the Drug policy, DPCO, Patent and design act;
  - e. understand the labeling requirements and packaging guidelines for drugs and cosmetics;
  - f. be able to understand the concepts of Dangerous Drugs Act, Pharmacy Act and Excise duties Act; and
  - g. other laws as prescribed by the Pharmacy Council of India from time to time including International Laws.

#### Text books (Theory)

Mithal , B M. Textbook of Forensic Pharmacy. Calcutta :National; 1988.

#### Reference books (Theory)

- a. Singh, KK, editor. Beotra's the Laws of Drugs, Medicines & cosmetics. Allahabad: Law Book House; 1984.
- b. Jain, NK. A Textbook of forensic pharmacy. Delhi: Vallabh prakashan ; 1995.
- c. Reports of the Pharmaceutical enquiry Committee
- d. I.D.M.A., Mumbai. DPCO 1995
- e. Various reports of Amendments.
- f. Deshapande, S.W. The drugs and magic remedies act 1954 and rules 1955. Mumbai: Susmit Publications; 1998.
- g. Eastern Book Company .The narcotic and psychotropic substances act 1985, Lucknow: Eastern; 1987.

### 3. Detailed syllabus and lecture wise schedule:

#### Title of the topic

- 1. Pharmaceutical Legislations** – A brief review.
- 2. Principle and Significance of professional ethics.** Critical study of the code of pharmaceutical ethics drafted by PCI.
- 3. Drugs and Cosmetics Act, 1940, and its rules 1945.**  
Objectives, Legal definition, Study of Schedule's with reference to Schedule B, C&C1, D, E1, F&F1, F2, F3, FF, G, H, J, K, M, N, P, R, V, W, X, Y.  
Sales, Import, labeling and packaging of Drugs And Cosmetics  
Provisions Relating to Indigenous Systems.  
Constitution and Functions of DTAB, DCC, CDL.  
Qualification and duties –Govt. analyst and Drugs Inspector.



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4. **Pharmacy Act –1948.**  
Objectives Legal Definitions, General Study, Constitution and Functions of State & Central Council, Registration & Procedure, ER.
5. **Medicinal and Toilet Preparation Act –1955.**  
Objectives, Legal Definitions, Licensing, Bonded and Non Bonded Laboratory, Ware Housing, Manufacture of Ayurvedic, Homeopathic, Patent & Proprietary Preparations.
6. **Narcotic Drugs and Psychotropic substances Act-1985 and Rules.** Objectives, Legal Definitions, General Study, Constitution and Functions of narcotic & Psychotropic Consultative Committee, National Fund for Controlling the Drug Abuse, Prohibition, Control and regulations, Schedules to the Act.
7. **Study of Salient Features of Drugs and magic remedies Act and its rules.**
8. **Study of essential Commodities Act Relevant to drugs price control Order.**
9. **Drug Price control Order & National Drug Policy (Current).**
10. **Prevention Of Cruelty to animals Act-1960.**
11. **Patents & design Act-1970.**
12. **Brief study of prescription and Non-prescription Products.**

#### 4. Assignments:

##### Format of the assignment

1. Minimum & Maximum number of pages
2. It shall be a computer draft copy
3. Reference(s) shall be included at the end.
4. Name and signature of the student
5. Assignment can be a combined presentation at the end of the academic year.
6. Time allocated for presentation may be 8+2 Min

##### Case studies relating to

1. Drugs and Cosmetics Act and rules along with its amendments, Dangerous Drugs Act, Medicinal and Toilet preparation Act, New Drug Policy, Professional Ethics, Drugs (Price control) Order, Patent and Design Act.
2. Various prescription and non-prescription products.
3. Medical and surgical accessories.
4. Diagnostic aids and appliances available in the market.



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## Courses which address Human Values into the Curriculum

- B. Pharmacy:
  - Pharmacy Practice (BP703T)
  - Social and Preventive Pharmacy (BP802T)
- Pharm.D:
  - Community Pharmacy (2.5)



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## BP 703T. PHARMACY PRACTICE (Theory)

45 Hours

**Scope:** In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug information, and therapeutic drug monitoring for improved patient care. In community pharmacy, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling for improved patient care in the community set up.

**Objectives:** Upon completion of the course, the student shall be able to

1. know various drug distribution methods in a hospital
2. appreciate the pharmacy stores management and inventory control
3. monitor drug therapy of patient through medication chart review and clinical review
4. obtain medication history interview and counsel the patients
5. identify drug related problems
6. detect and assess adverse drug reactions
7. interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states
8. know pharmaceutical care services
9. do patient counseling in community pharmacy;
10. appreciate the concept of Rational drug therapy.

### Unit I:

10 Hours

#### a) Hospital and its organization

Definition, Classification of hospital- Primary, Secondary and Tertiary hospitals, Classification based on clinical and non- clinical basis, Organization Structure of a Hospital, and Medical staffs involved in the hospital and their functions.

#### b) Hospital pharmacy and its organization

Definition, functions of hospital pharmacy, Organization structure, Location, Layout and staff requirements, and Responsibilities and functions of hospital pharmacists.

#### c) Adverse drug reaction

Classifications - Excessive pharmacological effects, secondary pharmacological effects, idiosyncrasy, allergic drug reactions, genetically determined toxicity, toxicity following sudden withdrawal of drugs, Drug interaction- beneficial interactions, adverse interactions, and pharmacokinetic drug interactions, Methods for detecting



drug interactions, spontaneous case reports and record linkage studies, and Adverse drug reaction reporting and management

**d) Community Pharmacy**

Organization and structure of retail and wholesale drug store, types and design, Legal requirements for establishment and maintenance of a drug store, Dispensing of proprietary products, maintenance of records of retail and wholesale drug store.

**Unit II:**

**10 Hours**

**a) Drug distribution system in a hospital**

Dispensing of drugs to inpatients, types of drug distribution systems, charging policy and labelling, Dispensing of drugs to ambulatory patients, and Dispensing of controlled drugs.

**b) Hospital formulary**

Definition, contents of hospital formulary, Differentiation of hospital formulary and Drug list, preparation and revision, and addition and deletion of drug from hospital formulary.

**c) Therapeutic drug monitoring**

Need for Therapeutic Drug Monitoring, Factors to be considered during the Therapeutic Drug Monitoring, and Indian scenario for Therapeutic Drug Monitoring.

**d) Medication adherence**

Causes of medication non-adherence, pharmacist role in the medication adherence, and monitoring of patient medication adherence.

**e) Patient medication history interview**

Need for the patient medication history interview, medication interview forms.

**f) Community pharmacy management**

Financial, materials, staff, and infrastructure requirements.

**Unit III:**

**10 Hours**

**a) Pharmacy and therapeutic committee**

Organization, functions, Policies of the pharmacy and therapeutic committee in including drugs into formulary, inpatient and outpatient prescription, automatic stop order, and emergency drug list preparation.

**b) information services**



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Drug and Poison information centre, Sources of drug information, Computerised services, and storage and retrieval of information.

c) **Patient counseling**

Definition of patient counseling; steps involved in patient counseling, and Special cases that require the pharmacist

d) **Education and training program in the hospital**

Role of pharmacist in the education and training program, Internal and external training program, Services to the nursing homes/clinics, Code of ethics for community pharmacy, and Role of pharmacist in the interdepartmental communication and community health education.

e) **Prescribed medication order and communication skills**

Prescribed medication order- interpretation and legal requirements, and Communication skills- communication with prescribers and patients.

**Unit IV 8 Hours**

a) **Budget preparation and implementation**

Budget preparation and implementation

b) **Clinical Pharmacy**

Introduction to Clinical Pharmacy, Concept of clinical pharmacy, functions and responsibilities of clinical pharmacist, Drug therapy monitoring - medication chart review, clinical review, pharmacist intervention, Ward round participation, Medication history and Pharmaceutical care.

Dosing pattern and drug therapy based on Pharmacokinetic & disease pattern.

c) **Over the counter (OTC) sales**

Introduction and sale of over the counter, and Rational use of common over the counter medications.

**Unit V 7 Hours**

a) **Drug store management and inventory control**

Organisation of drug store, types of materials stocked and storage conditions, Purchase and inventory control: principles, purchase procedure, purchase order, procurement and stocking, Economic order quantity, Reorder quantity level, and Methods used for the analysis of the drug expenditure

b) **Investigational use of drugs**



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Description, principles involved, classification, control, identification, role of hospital pharmacist, advisory committee.

**c) Interpretation of Clinical Laboratory Tests**

Blood chemistry, hematology, and urinalysis

**Recommended Books (Latest Edition):**

1. Merchant S.H. and Dr. J.S.Quadry. *A textbook of hospital pharmacy*, 4th ed. Ahmadabad: B.S. Shah Prakakshan; 2001.
2. Parthasarathi G, Karin Nyfort-Hansen, Milap C Nahata. *A textbook of Clinical Pharmacy Practice- essential concepts and skills*, 1<sup>st</sup> ed. Chennai: Orient Longman Private Limited; 2004.
3. William E. Hassan. *Hospital pharmacy*, 5th ed. Philadelphia: Lea & Febiger; 1986.
4. Tipnis Bajaj. *Hospital Pharmacy*, 1<sup>st</sup> ed. Maharashtra: Career Publications; 2008.
5. Scott LT. *Basic skills in interpreting laboratory data*, 4th ed. American Society of Health System Pharmacists Inc; 2009.
6. Parmar N.S. *Health Education and Community Pharmacy*, 18th ed. India: CBS Publishers & Distributers; 2008.

**Journals:**

1. Therapeutic drug monitoring. ISSN: 0163-4356
2. Journal of pharmacy practice. ISSN : 0974-8326
3. American journal of health system pharmacy. ISSN: 1535-2900 (online)
4. Pharmacy times (Monthly magazine)



## BP 802T SOCIAL AND PREVENTIVE PHARMACY

Hours: 45

### Scope:

The purpose of this course is to introduce to students a number of health issues and their challenges. This course also introduced a number of national health programmes. The roles of the pharmacist in these contexts are also discussed.

### Objectives:

After the successful completion of this course, the student shall be able to:

- Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
- Have a critical way of thinking based on current healthcare development.
- Evaluate alternative ways of solving problems related to health and pharmaceutical issues

### Course content:

#### Unit I:

10 Hours

**Concept of health and disease:** Definition, concepts and evaluation of public health. Understanding the concept of prevention and control of disease, social causes of diseases and social problems of the sick.

**Social and health education:** Food in relation to nutrition and health, Balanced diet, Nutritional deficiencies, Vitamin deficiencies, Malnutrition and its prevention.

**Sociology and health:** Socio cultural factors related to health and disease, Impact of urbanization on health and disease, Poverty and health

**Hygiene and health:** personal hygiene and health care; avoidable habits

#### Unit II:

10 Hours

**Preventive medicine:** General principles of prevention and control of diseases such as cholera, SARS, Ebola virus, influenza, acute respiratory infections, malaria, chicken guinea, dengue, lymphatic filariasis, pneumonia, hypertension, diabetes mellitus, cancer, drug addiction-drug substance abuse

#### Unit III:

10 Hours

**National health programs, its objectives, functioning and outcome of the following:** HIV AND AIDS control programme, TB, Integrated disease surveillance program (IDSP), National leprosy control programme, National mental health program, National



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programme for prevention and control of deafness, Universal immunization programme, National programme for control of blindness, Pulse polio programme.

**Unit IV:**

**08 Hours**

National health intervention programme for mother and child, National family welfare programme, National tobacco control programme, National Malaria Prevention Program, National programme for the health care for the elderly, Social health programme; role of WHO in Indian national program

**Unit V:**

**07 Hours**

Community services in rural, urban and school health: Functions of PHC, Improvement in rural sanitation, national urban health mission, Health promotion and education in school.

**Recommended Books (Latest edition):**

1. Short Textbook of Preventive and Social Medicine, Prabhakara GN, 2<sup>nd</sup> Edition, 2010, ISBN: 9789380704104, JAYPEE Publications
2. Textbook of Preventive and Social Medicine (Mahajan and Gupta), Edited by Roy Rabindra Nath, Saha Indranil, 4<sup>th</sup> Edition, 2013, ISBN: 9789350901878, JAYPEE Publications
3. Review of Preventive and Social Medicine (Including Biostatistics), Jain Vivek, 6<sup>th</sup> Edition, 2014, ISBN: 9789351522331, JAYPEE Publications
4. Essentials of Community Medicine—A Practical Approach, Hiremath Lalita D, Hiremath Dhananjaya A, 2<sup>nd</sup> Edition, 2012, ISBN: 9789350250440, JAYPEE Publications
5. Park Textbook of Preventive and Social Medicine, K Park, 21<sup>st</sup> Edition, 2011, ISBN-14: 9788190128285, BANARSIDAS BHANOT PUBLISHERS.
6. Community Pharmacy Practice, Ramesh Adepu, BSP publishers, Hyderabad

**Recommended Journals:**

1. Research in Social and Administrative Pharmacy, Elsevier, Ireland



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## 2.5 COMMUNITY PHARMACY (THEORY)

**Theory : 2 Hrs. /Week**

1. **Scope:** In the changing scenario of pharmacy practice in India, Community Pharmacists are expected to offer various pharmaceutical care services. In order to meet this demand, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling, health screening services for improved patient care in the community set up.
2. **Objectives:** Upon completion of the course, the student shall be able to –
  - a. know pharmaceutical care services;
  - b. know the business and professional practice management skills in community pharmacies;
  - c. do patient counselling & provide health screening services to public in community pharmacy;
  - d. respond to minor ailments and provide appropriate medication;
  - e. show empathy and sympathy to patients; and
  - f. appreciate the concept of Rational drug therapy.

**Text Books:**

- a. Health Education and Community Pharmacy by N.S.Parmar.
- b. WHO consultative group report.
- c. Drug store & Business management by Mohammed Ali & Jyoti.

**Reference books:**

- a. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.
- b. Comprehensive Pharmacy Review – Edt. Leon Shargel. Lippincott Williams & Wilkins.


**Special requirements:**

1. Either the college is having model community pharmacy (meeting the schedule N requirement) or sign MoU with at least 4-5 community pharmacies nearby to the college for training the students on dispensing and counselling activities.
2. Special equipments like B.P apparatus, Glucometer, Peak flow meter, and apparatus for cholesterol estimation.

**3. Scheme of evaluation (80 Marks)**

- |  |    |
|--|----|
| 1. Synopsis  | 10 |
| 2. Major Experiment  | 30 |
| (Counselling of patients with specific diseases – emphasis should be given on Counselling introduction, content, process and conclusion) |    |
| 3. Minor Experiment (Ability to measure B.P/ CBG / Lung function)  | 15 |
| 4. Prescription Analysis (Analyzing the prescriptions for probable drug interaction and ability to tell the management)                  | 15 |
| 5. Viva – Voce   | 10 |



  
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#### 4. Lecture wise programme :

##### Topics

- 1 **Definition, scope, of community pharmacy**  
**Roles and responsibilities of Community pharmacist**
- 2 **Community Pharmacy Management**
  - a) Selection of site, Space layout, and design
  - b) Staff, Materials- coding, stocking
  - c) Legal requirements
  - d) Maintenance of various registers
  - e) Use of Computers: Business and health care soft wares
- 3 **Prescriptions** – parts of prescription, legality & identification of medication related problems like drug interactions.
- 4 **Inventory control in community pharmacy**  
Definition, various methods of Inventory Control  
**ABC, VED, EOQ, Lead time, safety stock**
- 5 **Pharmaceutical care**  
Definition and Principles of Pharmaceutical care.
- 6 **Patient counselling**  
Definition, outcomes, various stages, barriers, Strategies to overcome barriers  
Patient information leaflets- content, design, & layouts, advisory labels
- 7 **Patient medication adherence**  
Definition, Factors affecting medication adherence, role of pharmacist in improving the adherence.
- 8 **Health screening services**  
Definition, importance, methods for screening  
Blood pressure/ blood sugar/ lung function  
and Cholesterol testing
- 9 **OTC Medication- Definition, OTC medication list & Counselling**
- 10 **Health Education**  
WHO Definition of health, and health promotion, care for children, pregnant & breast feeding women, and geriatric patients.  
Commonly occurring Communicable Diseases, causative agents,  
Clinical presentations and prevention of communicable diseases – Tuberculosis, Hepatitis, Typhoid, Amoebiasis, Malaria, Leprosy, Syphilis, Gonorrhoea and AIDS  
Balance diet, and treatment & prevention of deficiency disorders  
Family planning – role of pharmacist
- 11 **Responding to symptoms of minor ailments**  
Relevant pathophysiology, common drug therapy to,  
Pain, GI disturbances (Nausea, Vomiting, Dyspepsia, diarrhea, constipation), Pyrexia, Ophthalmic symptoms, worms infestations.
- 12 **Essential Drugs concept and Rational Drug Therapy**  
**Role of community pharmacist**
- 13 **Code of ethics for community pharmacists**



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## Course which address Environment and Sustainability into the Curriculum

- B. Pharmacy: Environmental sciences (BP206T)



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## BP 206 T. ENVIRONMENTAL SCIENCES (Theory)

30 hours

**Scope:** Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.

**Objectives:** Upon completion of the course the student shall be able to:

1. Create the awareness about environmental problems among learners.
2. Impart basic knowledge about the environment and its allied problems.
3. Develop an attitude of concern for the environment.
4. Motivate learner to participate in environment protection and environment improvement.
5. Acquire skills to help the concerned individuals in identifying and solving environmental problems.
6. Strive to attain harmony with Nature.

### Course content:

#### Unit-I

10hours

The Multidisciplinary nature of environmental studies

Natural Resources

Renewable and non-renewable resources:

Natural resources and associated problems

a) Forest resources; b) Water resources; c) Mineral resources; d) Food resources; e) Energy resources; f) Land resources: Role of an individual in conservation of natural resources.

#### Unit-II

10hours

Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Introduction, types, characteristic features, structure and function of the ecosystems: Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

#### Unit- III

10hours

Environmental Pollution: Air pollution; Water pollution; Soil pollution





**Recommended Books (Latest edition):**

1. Y.K. Sing, Environmental Science, New Age International Pvt, Publishers, Bangalore
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India,
4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
5. Clark R.S., Marine Pollution, Clarendon Press Oxford
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
7. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
8. Down of Earth, Centre for Science and Environment



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