

[School of Pharmacy
Syllabus]

**Bachelor of Pharmacy 3rd year (VI Semester)
(Theory and Practical)**

S No.	Course	Subject name	Credits		Sessional			Exam	Total
			T	P	TA	MSE	Total	ESE	
1	GSP-601	Hospital Pharmacy	4	0	30	20	50	50	100
2	GSP-602	Pharmaceutical Technology-II	3	0	30	20	50	50	100
3	GSP-603	Medicinal Chemistry- II	3	0	30	20	50	50	100
4	GSP-604	Pharmacognosy- IV	3	0	30	20	50	50	100
5	GSP-605	Pharmacology-II	3	0	30	20	50	50	100
PRACTICAL									
2	GSP-602P	Pharmaceutical Technology-II	0	2	30	20	50	50	100
3	GSP-603P	Medicinal Chemistry II	0	2	30	20	50	50	100
4	GSP-604P	Pharmacognosy- IV	0	2	30	20	50	50	100
5	GSP-605P	Pharmacology-II	0	2	30	20	50	50	100
Total									900

T- Theory, P- Practical, TA- Teacher Assessment, MSE- Mid Semester Examination, ESE- End semester examination.

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GSP-601

HOSPITAL PHARMACY

UNIT-1.

Organization and Structure: Organization of a hospital and hospital pharmacy, Responsibilities of a hospital pharmacist. Pharmacy and therapeutic committee, Budget preparation and implementation. Hospital Formulary: Contents, preparation and revision of hospital formulary.

UNIT-2.

Drug Store Management and Inventory Control: Organization of drug, Types of materials stocked, storage conditions. Purchase and Inventory control: Principles, various methods of inventory control, purchase procedures, purchase order, procurement and stocking.

UNIT-3.

Central Sterile Supply Unit and their Management: Aseptic techniques and clean area classification, Types of materials for sterilization, packing of materials prior to sterilization, sterilization equipments, Supply of sterile materials. Manufacture of Sterile and Non-sterile Products: Policy making of manufacturable items, demand and costing, personnel requirements, manufacturing practice, Master formula record, Production control, Manufacturing records.

UNIT-4.

Drug Information Service: Sources of information on drugs, treatment schedules, procurement of information, computerized services (e.g. MEDLINE), Retrieval of information, Medication error. Records and Reports: Prescription filling drug profile, Patient medication profile, case on drug interaction & adverse reactions, idiosyncratic cases etc.

UNIT-5.

Drug distribution systems in Hospitals: Out-patient dispensing, methods adopted, Dispensing of drugs to in-patients. Types of drug distribution systems Charging Policy, labeling, Dispensing of drugs to ambulatory patients, Dispensing of controlled drugs.

Nuclear Pharmacy: Introduction to Radiopharmaceutics- radio-active half life, Units of radioactivity. Production of radio pharmaceuticals, methods of isotonic tagging, preparation of radioisotopes in laboratory using radiation dosimetry, radio-isotope generators, permissible radiation dose level, Radiation hazards and their prevention, specifications for radio-active laboratory.

BOOKS RECOMMENDED:

1. Hasan, Hospital Pharmacy, Lea & Febiger, Philadelphia.
2. Merchant H.S. and Qadry J.S. Text Book of Hospital Pharmacy, B.S. Shah Prakashan, Ahmedabad.
3. Mohd. Aqil., Practice of Hospital, Clinical and Community Pharmacy., Elsevier Publisher.

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GSP-602

PHARMACEUTICAL TECHNOLOGY - II

UNIT-1.

Tablets- Formulation of different types of tablets, granulation techniques, physics of tablets making, machinery and tooling and the equipments employed, evaluation of tablets including stability testing as per ICH guidelines

Coating of Tablets: Types of coating, film forming materials, formulation of coating solution, equipments for coating process, evaluation of coated tablet.

UNIT-2.

Capsules: Introduction to capsules as a dosage form, hard and soft gelatin capsules, formulation and evaluation, machinery, packaging, stability testing and storage

Micro-encapsulation: Types of microcapsule, importance of micro-encapsulation in pharmacy, micro-encapsulation techniques, evaluation of micro capsules.

UNIT-3.

Approaches to Sustained and controlled release dosage forms. In-vitro methods of evaluation.

UNIT-4.

Parenteral Products: Preformulation factors, routes of administration, water for injection, pyrogenicity, non-aqueous vehicles. Formulation and evaluation, equipments, containers and closures and their selection.

UNIT-5.

Sterile products (ISI/ BS specification)

Formulation and evaluation of Ophthalmic, Nasal and Ear products.

GSP-602P

PHARMACEUTICAL TECHNOLOGY – II (PRACTICAL)

1. Experiments to illustrate preparation, stabilization and evaluation of pharmaceutical products as per the theory syllabus
2. Evaluation of Materials used in pharmaceutical packaging (ISI/ BS specification).

BOOKS RECOMMENDED

1. Remington: The Science and Practice of Pharmacy Pharmaceutical Sciences Vol. I & II Lippincott William Wilkins.
2. Lachman L., Lieberman H.A, Kanig J.L, Theory and Practice of Industrial Pharmacy, Lea & Febiger, Philadelphia, U.S.A.
3. H.C. Ansel, Introduction to Pharmaceutical Dosage Forms, Lippincott William Wilkins
4. Herbert A. Liebermann & Leon Lachman, Theory & Practice of Industrial Pharmacy,
5. Manohar A.Potdar, 'CGMP for Pharmaceuticals".Pharma Med Press, Hyderabad
6. Augsburger Larry L."Pharmaceutical Dosage Forms: tablets " 3rd edition Informa healthcare
7. IP (Latest edition)
8. BP (Latest edition)

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9. USP (Latest edition)

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GSP-603

MEDICINAL CHEMISTRY - II

UNIT-1.

Basic concept of drug design, Introduction to Analogues based drug design, Structure based drug design, and Introduction to QSAR & Computer aided drug design.

UNIT- 2.

Mode of action, uses, SAR of the following classes of drugs included in latest edition of pharmacopoeia (synthetic procedures and assay of individually mentioned drugs only)

Cardiac glycosides & drug used for CHF- Digitoxin

Anti-arrhythmic drugs- Propranolol, Procainamide

Anti-anginal drugs- Isosorbide mononitrate.

Antihypertensive drugs- Captopril, methyldopa, Nifedipine.

Anticoagulants- Heparin, Warfarin, Antihyperlipidemics- Lovastatin, Clofibrate.

UNIT-3.

Antispasmodic and Antiulcer drugs- Dicyclomine, Ranitidine, Omeprazole. Antitussives- Dextromethorphen.

UNIT-4.

Analgesics and Antipyretics – Aspirin, Mefanamic Acid, Ibuprofen, Diclofenac, Paracetamol.

UNIT-5.

Diuretics – Acetazolamide, Chlorthiazide; Furosemide, Spironolactone.

GSP-603P

MEDICINAL CHEMISTRY-II (PRACTICAL)

1. Synthesis of at least five selected drugs from the course content involving two or more steps.
2. Establishing the pharmacopoeial standards of the drugs synthesized.
3. Simple experiment demonstrating microwave assisted synthesis

BOOKS RECOMMENDED:

1. Thomas J..Perun,” Computer –aided Drug Design methods applications’.PharmaMed Press, Hyderabad
2. Delgado J N and Remers W A R, Eds., Wilson And Gisworld’s Text book of Organic Medicinal and Pharmaceutical Chemistry, J. Lippincott Co., Philadelphia.
3. Foye W C, Principles of Medicinal Chemistry, Lea & Febiger, Philadelphia.
4. Shri ram,/ Yogeewari, medicinal chemistry, 2nd. Ed, Pearson education
5. Singh Harkishan and Kapoor, V.K., Organic Pharmaceutical Chemistry, Vallabh Prakashan, Delhi.
6. Korolkovas, Essentials of medicinal chemistry, Wiley India
7. Pharmacopoeia of India 2010, Ministry of Health, Govt. of India.
8. Mann P G & Saunders B C, Practical Organic Chemistry, ELBS/ Longman, London.

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9. Furniss B S, Hannaford A J, Smith P W G and Tathell A R, Vogel's Textbook of Practical Organic Chemistry, The ELBS/ Longman, London.

GSP-604
PHARMACOGNOSY-IV

UNIT-1.

Quality control and Standardization of herbal drugs: Extractive values, ash values, chromatographic techniques (TLC, HPTLC and HPLC) for determination of chromatographic markers, spectroscopic techniques and assay methods. Determination of heavy metals in herbal preparation and alcohol contents in Aristas and bhasams.

Quality control and rational use of herbal drugs as per WHO guidelines.

UNIT-2.

Phytopharmaceuticals: Isolation, characterisation and estimation of: Caffeine, Eugenol, Pectin, Solanine, Piperine, Tannic acid, Diosgenin, Hesperidine, Berberine, Calcium sennosides, Rutin, Glycyrrhizin, Menthol, Ephedrine, Quinine, Andrographolides and Gu ggul lipids. Katha industry in India.

UNIT-3.

World wide trade in Medicinal plants & derived product. Tropane alkaloids containing drugs, Cinchona, Ipecac, Rauwolfia, Taxol, Diosgenin, Digitalis, Liquorice, Papain, Ginseng, Aloe, Valerian, & plant laxatives.

Role of Medicinal & aromatic plants in National Economy.

UNIT-4.

Biological sources, preparation, Identification tests and uses of following enzymes– Diastase, papain, Penicillinase, Hyalluronidase, Streptokinase. Plant Bitters & Sweeteners.

UNIT-5.

Historical development of plant tissue culture, type of culture, Nutritional requirement, growth & their maintenance. Application of plant tissue culture in pharmacognosy.

GSP-604P
PHARMACOGNOSY –IV (PRACTICAL)

1. Identification of crude drugs listed above.
2. Microscopic study of characters of any 8 selected drugs given in theory in entire and powder form.
3. Chemical evaluation of powdered drugs & Enzymes.
4. Isolation of some phytoconstituents.
5. Chromatographic studies of some herbal constituents.
6. Some preliminary experiments in plant tissue culture.

BOOKS RECOMMENDED:

1. Trease, G.E. & Evans, W.C. "Pharmacognosy" Bailliere Tindall East Bourne, U.K.
2. Tyler V.E. Pharmacognosy, Lea & Febiger Phjadelphia.
3. Wallis T.E. Text book of Pharmacognosy" J &A Churchill Ltd. London.
4. Atal & Kapur, Cultivation & Utilization of Medicinal Plants, RRL, Jammu.
5. Stahl. E, Thin Layer Chromatography. A laboratory handbook, Springer Verlog, Berlin.

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6. Clarke ECG, Isolation & Identification of drugs. The Pharmaceutical Press, London.
7. Street H.E. Tissue Culture & Plant Science, Academic Press, London.

GSP 605

PHARMACOLOGY-II

UNIT-1.

Pharmacology of CVS: Cardiac glycosides, Antihypertensive drugs, Antianginal drugs, Antiarrhythmics, Antihyperlipidemics

UNIT-2.

Drugs Acting on Haemopoietic System

Haematinics, Vit. K & anticoagulants, Fibrinolytics & antiplatelet drugs, Plasma Volume expanders.

UNIT-3.

Drugs Acting on Respiratory System

Anti-asthmatic drugs, Anti-tussives & Expectorants, Respiratory Stimulants

UNIT-4.

NSAIDS & Anti-gout Drugs, Diuretics

UNIT-5.

Autocoids: Histamine, 5HT and their antagonists, Prostaglandins, Thromboxane, Leukotrienes, Angiotensin and Bradykinin

GSP-605P

PHARMACOLOGY-II (PRACTICAL)

Relevant experiments based on theory syllabus.

BOOKS RECOMMENDED:

1. Goodman & Gilman, The Pharmacological basis of Therapeutics, Editors:-JG Hardman, Le Limbird,PB Molinoss, RW Ruddon & AG Gil, Pergamon Press.
2. Bothara Sunil, Essentials of experimental in pharmacology, vol. 1, Pharma Med Press,Hyd.
3. Laurence, DR & Bannet PN; Clinical Pharmacology, Churchill Livingstone.
4. Rang MP, Date MM, Riter JM, Pharmacology Churchill Livingstone.
5. Tripathi, K.D. Essentials of Medical Pharmacology, Jay Pee Publishers, New Delhi.
6. Satoskar & Bhandarkar; Pharmacology & Pharmacotherapeutics, Popular Prakashan Pvt. Ltd., Bombay.
7. Turner, Screening methods in pharamacology, PharmaMed Press, Hyderabad
8. Ghosh, MN; Fundamentals of Experimental Pharmacology, Scientific Book Agency, Calcutta.
9. Grover J.K., Experiments in Pharmacy & Pharmacology, CBS Publishers, New Delhi.
10. Kulkarni S.K., Hand Book of Experimental Pharmacology, Vallabh Prakashan, Delhi.