

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of Teaching and Examination Bachelor of Pharmacy

VI- Semester

S.No.	Board of Study	Subject Code (New)	Nomenclature and Name of the Subject	Periods Per Week			Scheme of Exam Theory /Practical				Credits L+(T+H) 2
				L	T	P	ESE	CT	TA	Total Marks	
1	Pharmacy	341611 (41)	Pharmaceutical Industrial Management	4	1	-	70	20	10	100	5
2	Pharmacy	341612 (41)	Pharmaceutical Analysis II	4	1	-	70	20	10	100	5
3	Pharmacy	341613 (41)	Pharmaceutical Chemistry VII (Medicinal Chemistry – II)	4	1	-	70	20	10	100	5
4	Pharmacy	341614 (41)	Pharmacology – II	4	1	-	70	20	10	100	5
5	Pharmacy	341615 (41)	Pharmaceutics – VIII	3	1	-	70	20	10	100	4
6	Pharmacy	341621 (41)	Pharmaceutical Chemistry VII (Medicinal Chemistry – II) Lab	-	-	4	60	-	40	100	2
7	Pharmacy	341622 (41)	Pharmaceutical Analysis II Lab	-	-	4	60	-	40	100	2
8	Pharmacy	341623 (41)	Pharmacology – II Lab	-	-	4	60	-	40	100	2
9	Pharmacy	341624 (41)	Industrial Visit and Report writing	-	-	4	-	-	100	100	2
				19	5	16	530	100	270	900	32

Minimum Pass Marks

(A) Theory and Sessional (Combined) : 50 Percent

(B) Practical and Sessional (combined): 50 Percent

Duration of Theory Papers ; 3 Hour

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: **B. Pharma. VI Sem.**
Subject: **Pharmaceutical Industrial Management**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **70**
Minimum number of class tests to be conducted: **2**

Branch: **Pharmacy**
Code: **341611 (41)**
Total Tutorial Period - **12**

Status of pharmaceutical industries in India. Project formulation, evaluation and implementation. Pharmaceutical Factory Planning and layouts, preparation of flow diagrams, technical data sheets.

Management:

Concepts on Management, Principles of Management, Administrative and Operative Management Entrepreneurship Development.

Material management:

Basic principles of Material Management, Purchase, Store and Inventory control.
Production Management : Different aspects of Production Management , Performance Evaluation Technique, flow-process, know how process and maintenance.

Accountancy:

Principles of accountancy, Journal entries and ledger posting, preparation of trial balance, cash book, bank reconciliation statement, rectification of errors, profits and loss account, balance sheet, purchase, keeping and pricing of stocks, treatment of cheques, bill of exchange, promissory notes and hundies, documentary bills.

Economics:

Principles of economics with special reference to the laws of demands and supply, demand schedule, demand curves, general principles of insurance and inland and foreign trade, procedure of exporting and importing goods.

Pharmaceutical Marketing:

Functions, wholesale, retail, and mail order business ,market research.

Salesmanship:

Principles of sales promotion, advertising, and ethics of Sales, merchandising, Window display and literature detailing.

Reference / Recommend Books:

1. Shukla, S. M., Advanced Accountancy, Mahershwari Sahitya Bhawan, Agra.
2. Gupta, R. L., Advanced Accountancy, Vol. I and II, Sultanchand & Company, New Delhi.
3. Kotler, P., Marketing Management, Prentice Hall of India Limited.
4. Stanton, W. J., Fundamentals of Marketing Tata McGraw Hill Limited, New Delhi.
5. Buskir K. and Richard H., Principles of Marketing – The Management View, Hold Rinehard and Winston Incorporated, New York.
6. Sherlekar, S. R., Marketing Management, Himalaya Publishing House, New Delhi.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: **B. Pharma. VI Sem.**

Subject: **Pharmaceutical Analysis -II**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **70**

Minimum number of class tests to be conducted: **2**

Branch: **Pharmacy**

Code: **341612 (41)**

Total Tutorial Period - **12**

The theoretical aspects, basic instrumentation, elements of interpretation of spectra and pharmaceutical application of the following analytical techniques –

1. Polarography
2. Amperometry
3. Chromatography: Paper Chromatography TLC, GLC, HPLC, HPTLC.
4. Ultraviolet and Visible spectrophotometry
5. Infra red spectrophotometry.
6. Fluorimetry.
7. Mass Spectroscopy.
8. NMR Spectroscopy.
9. Atomic Absorption.
10. X- Ray Diffraction.
11. Flame Photometry.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B. Pharma. VI Sem.
Subject: Pharmaceutical Chemistry –VII
(Medicinal Chemistry – II)

Branch: Pharmacy
Code: 341613 (41)

Total Theory Periods: 50

Total Tutorial Period – 12

Total Marks in End Semester Exam: 70

Minimum number of class tests to be conducted: 2

The synthesis of selected drugs, mode of action, classification, uses, SAR including physicochemical and stearic aspects of the following category of drugs:

- (A) **Drugs acting on CNS:**
1. General anaesthetics.
 2. Hypnotics and sedative.
 3. Opoïd analgesics.
 4. Anti conuvsants.
 5. CNS Stimulants.
 6. Anti parkinsonism drugs.
 7. Psychopharmacological agents.
(neuroleptics, antidepressants, anxiolytics).
- (B) **Anti spasmodic and antiulcer drugs,**
- (C) **Anticoagulant and Antiplatelet drugs.**
- (D) **Vitamins.**
- (E) **Diagnostic agents.**
- (F) **Pharmaceutical aids.**

Principles of drugs design (theoretical aspects). Traditional analog (QSAR), Mechanism based approaches (Computer aided drug design and molecular modeling).

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: **B. Pharma. VI Sem.**

Subject: **Pharmacology -II**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **70**

Minimum number of class tests to be conducted: 2

Branch: **Pharmacy**

Code: **341614 (41)**

Total Tutorial Period - **12**

Pharmacology and Pathophysiology of Central Nervous System -

- a) Neurohumoral transmission in the CNS.
- b) General Anaesthetics.
- c) Alcohols and disulfiram.
- d) Sedative, hypnotics, anti anxiety agents and centrally acting muscle relaxants.
- e) Psychopharmacological agents (antipsychotics, antidepressants, antimaniacs and hallucinogens).
- f) Antiepileptic drugs.
- g) Anti parkinsonian drugs.
- h) Narcotic analgesics and antagonists.
- i) CNS stimulants.
- j) Drug addiction and drug abuse.

Drug acting on the gastrointestinal tract and Pathophysiology of GIT drugs has to be NPC-

- a) Antacids, antisecretory and antiulcer drugs.
- b) Laxatives and antidiarrhoeal drugs.
- c) Appetite stimulants and suppressants.
- d) Emetics and antiemetics.
- e) Miscellaneous : Carminative, demulcents, protectives, adsorbents, astringents, digestants, enzymes and mucolytics.

Drug acting on the hemopoietic system and pathophysiology of hemopoietic system -

- a) Hematinics.
- b) Anticoagulants, vitamin K and hemostatic agents.
- c) Fibrinolytic and antiplatelet drugs.
- d) Blood and plasma volume expanders.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B. Pharma. VI Sem.

Subject: Pharmaceutics -VIII

Total Theory Periods: 40

Total Marks in End Semester Exam: 70

Minimum number of class tests to be conducted: 2

Branch: Pharmacy

Code: 341615 (41)

Total Tutorial Period - 12

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.

Drug Store, Management and Inventory Control:

- a. Organization of drug store, types of materials stocked, storage condition
- b. Purchase and inventory control-principles, purchase procedures, purchase orders, procurement and stocking.

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.

Central Sterile Supply Unit and Their Management:

Types of materials for sterilization, packing of materials prior to sterilization, sterilization, sterilization equipment, supply of sterile materials.

Manufacture of sterile and nonsterile products:

Policy making of manufacturable items, demand and costing, personnel requirements, manufacturing practice, master formula card, production control, manufacturing records.

Drug Information Service:

Source of information on drugs, disease, 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 cases on drug interaction and adverse reactions, idiosyncratic case etc.

Nuclear Pharmacy:

Introduction to radio –Pharmaceuticals, radio-active half life, units of radio activity, production of radio –Pharmaceuticals, preparation of radio – isotopes in laboratory using radiation dosimetry, radio isotopes generators, permissible radiation dose level, radiation hazards and their prevention, specifications for radio – active laboratory.

Reference / Recommend Books:

1. Allwodd M.C. and Fell J. T., Text book of Hospital Pharmacy, Blackwell Scientific Publication, Oxford.
2. Hassan W. E., Lea and Febiger, Philadelphia Hospital Pharmacy
3. Merchant H. S., Quadry J.S., Text book of Hospital Pharmacy, B. S. Shah Prakashan, Ahemdabad.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: **B. Pharma. VI Sem.**

Subject: **Pharmaceutical Chemistry – VII (Medicinal Chemistry – II) Lab**

Total Practical Periods: **50**

Total Marks in End Semester Exam: **60**

Branch: **Pharmacy**

Code: **341621 (41)**

Experiments to be Performed

- Exp.1 - Exercise based on QSAR.
- Exp.2 - Identification of constituents of drugs from the course content.
- Exp.3 - Establish the pharmacopial standards of the drug from the course contents.
- Exp.4 - Determination of partition coefficients, molar refractivity & dissociation constant of compounds for QSAR analysis.

Reference / Recommend Books:

1. **Foye, W.C. Principles of Medicinal Chemistry, Lea and Febiger, Philadelphia.**
2. **Wolff, M.E. Ed., Burger's Medicinal Chemistry, John Wiley and Sons, New York.**
3. **Hansch, C., Comprehensive Medicinal Chemistry, Pergarnon Press, Oxford.**
4. **Delagado, J.N. and Remers, W.A.R, Wilson and Giswold's Test Book of Organic, Medicinal and Pharmaceutical Chemistry, J.Lippincott Co., Philadelphia**
5. **Nogrady, T., Medicinal Chemistry-A Biochemical Approach, Oxford University Press, New York, Oxford.**
6. **Furnis, B.S. (ed.), Vogel's Text Book of Practical Organic Chemistry, 4th edn. ELBS, 1980.**
7. **Kadam & Mahadik's A Test book of Medicinal Chemistry.**

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: **B. Pharma. VI Sem.**

Branch: **Pharmacy**

Subject: **Pharmaceutical Analysis –II Lab**

Code: **341622 (41)**

Total Practical Periods: **50**

Total Marks in End Semester Exam: **60**

Experiments to be Performed

- Exp.1 - Preparation of 1 % w/v solution of potassium permanganate.
- Exp.2 - Assay of Phenobarbitone.
- Exp.3 - Assay of Prochlorperazine tablets.
- Exp.4 - Assay of Isoniazide tablet.
- Exp.5 - Preparation of calibration curve for potassium dichromate.
- Exp.6 - Find out the percentage of borax & boric acid in the given sample.
- Exp.7 - Spectrophotometric determination of percent purity of given sample of salicylic acid.
- Exp.8 - Estimation of aspirin through colourimeter.
- Exp.9 - Some experiments are based on the TLC.
- Exp.10 - Some experiments are based on the paper chromatography.
- Exp.11 - Estimation of Na⁺, K⁺, Ca⁺⁺ ions using flame photometry.
- Exp.12 - Colourimetric estimation of give sample of salicylic acid.

Reference / Recommend Books:

1. **Svehla, G. Vogel's Text Book of Micro and Semi Micro Qualitative Inorganic Analysis, Orient Longman, Hyderabad.**
2. **Beckett, A.K. and Stenlake, J.B., Practical Pharmaceutical Chemistry, The Athlone Press of the University of London.**
3. **Chatten, L.G., Text Book of Pharmaceutical Chemistry, Marcel Dekker, New York.**
4. **Silverstein, R.M., Bassier, G.C., and Morrill, T.C., Spectrophotometric Identification of Organic Compounds, John Wiley and Sons Inc.**
5. **Ewing, G.W., Instrumental Methods of Chemical Analysis.**

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: **B. Pharma. VI Sem.**
Subject: **Pharmacology – II Lab**
Total Practical Periods: **50**
Total Marks in End Semester Exam: **60**

Branch: **Pharmacy**
Code: **341623 (41)**

Experiments to be Performed

- Exp.1 - To study the different routes of administration of drugs in mice.
- Exp.2 - To study the effect of pentobarbital on righting reflex in mice.
- Exp.3 - To study the effect of chlorpromazine on the locomotor activities of mice using actophotometer
- Exp.4 - To study the apomorphine induced compulsive behaviour in mice.
- Exp.5 - To study the analgesic effect of morphine in mice using the tail flick method.
- Exp.6 - To study the analgesic effect of morphine in mice using hot plate method.
- Exp.7 - To study the analgesic effect of morphine against acetic acid induced writhing in mice.
- Exp.8 - To study the anti-anxiety effect of diazepam in mice using elevated plus, maze apparatus.
- Exp.9 - To study the effect of physostigmine and atropine on ciliary movement in from buccal cavity.
- Exp.10 - To study the antisecretory and ulcer protective effect of cimetidine in pylorus ligated rats.
- Exp.11 - To study the muscle relaxant effect of diazepam in mice using rostarod apparatus.
- Exp.12 - To study the effect of hepatic microsomal enzyme induction on the duration of action of pentobarbital sodium.
- Exp.13 - To study the blood and plasma volume expanders.
- Exp.14 - To study the effect of proton pump inhibitors on gastric acid reduction.
- Exp.15 - To study the anxiolytic effect of diazepam in mice mirrored chamber apparatus.

Reference / Recommend Books:

1. Hardmen, J.G., Limbired, L.E. Molinoss, P.B., Ruddon, R.W. and Gil, A.G., Goodman and Gillman's The Pharmacological basis of Therapeutics, Pergamon Press.
2. Satoskar, R.S. and Bhandarkar, S.D., Pharmacology and Pharmacotherapeutics.
3. Tripathi, K.D., Essentials of Medical Pharmacology.
4. Rang, M.P. Dale, M.M. and Ritter, J.M, Pharmacology, Churchill Livingstone.
5. F.S.K. Barar's text book of Pharmacotherapeutics S.Chand Publication Delhi.
6. Paul, L., Principles of Pharmacology, Chamman and Hall.
7. Herfindal, E.T. and Hirschman, J.L., Clinical Pharmacy and Therapeutics, William and Wilkins.
8. Katzung, B.G., Basic and Clinical Pharmacology, Prentice Hall International