

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Scheme of Teaching and Examination

Bachelor of Pharmacy

V - 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+P)/2
				L	T	P	ESE	CT	TA	Total Marks	
1	Pharmacy	341511(41)	Pharmaceutics – VII (Cosmetic Technology)	4	1	-	70	20	10	100	5
2	Pharmacy	341512(41)	Pharmaceutical Chemistry V (Biochemistry)	4	1	-	70	20	10	100	5
3	Pharmacy	341513(41)	Pharmaceutical Chemistry VI (Medicinal Chemistry – I)	4	1	-	70	20	10	100	5
4	Pharmacy	341514(41)	Pharmacognosy – III	4	1	-	70	20	10	100	5
5	Pharmacy	341515(41)	Pharmacology – I	4	1	-	70	20	10	100	5
6	Pharmacy	341521(41)	Pharmaceutics – VII (Cosmetic Technology) Lab	-	-	3	60	-	40	100	2
7	Pharmacy	341522(41)	Pharmaceutical Chemistry V (Biochemistry) Lab	-	-	3	60	-	40	100	2
8	Pharmacy	341523(41)	Pharmaceutical Chemistry VI (Medicinal Chemistry – I) Lab	-	-	3	60	-	40	100	2
9	Pharmacy	341524(41)	Pharmacognosy – III Lab	-	-	3	60	-	40	100	2
10	Pharmacy	341525(41)	Pharmacology – I Lab	-	-	3	60	-	40	100	2
			Total	20	5	15	650	100	250	1000	35

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. V Sem.**
Subject: **Pharmaceutics – VII (Cosmetic Technology)**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **70**
Minimum number of class tests to be conducted: **2**

Branch: **Pharmacy**
Code: **341511 (41)**
Total Tutorial Periods: **12**

Fundamentals of cosmetic sciences. Structure and function of skin and hair.

Formulation considerations, preparation, packaging and evaluation of the following categories of cosmetics:

- 1. Face Preparations:** Face powder, Compact powder, Talcum powder, Face packs and Masks.
- 2. Skin Preparations:** Skin creams, Anti-wrinkle preparations, Barrier materials, Protective creams and gels, Vanishing creams, Cold creams, Cleansing creams, Emollient, Anti-perspirant / deodorant, Moisturising and foundation formulations. Bleaching creams, Night and Massage cream, Hand cream, Protective skin tonics, Skin moisturisers, Sunscreen, Suntan, and anti- sun burn preparations.
- 3. Shaving preparations:** Lather shaving stick, Lather shaving cream, Shaving foams, Shaving gels, Pre- and After shave lotions.
- 4. Shampoo and Bath preparations:** Clear liquid shampoo, Aerosol shampoo, dry shampoo, Acid-balanced shampoo, Egg shampoo, Bath oils, Foam baths.
- 5. Hair Preparations:** Hair tonics, Hair conditioners, Hair lotions, Hair sprays, Hair dressings, Hair setting lotions and creams, Hair dyes, Bleaches, Hair waving, Hair straightners and Hair strengthners.
- 6. Dentrifice:** Tooth powders, Tooth pastes, Solid dentrifice, Tooth brush and Denture cleansers.
- 7. Foot Preparations:** Foot powders, Foot sprays, Foot creams, Corn preparations and Athlete's foot preparation.
- 8. Manicure Preparations:** Nail polish, Nail lacquer and Nail bleach.
- 9. Herbal Cosmetics:** Cosmetics containing Aloe, Babul, Brahmi, Chandan, Cucumber, Haldi, Jatamansi, Khus, Mehandi, Neem, Reetha, Shikakai, Tulsi, Arnica, Amla, Bhringraj and Volatile oils.
- 10. Cosmetic for babies.**
- 11. Colored make-up preparations:** Lipsticks, Rouge, Mascara, Eye make-up, Eye-liner, Eyebrow pencils.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **B. Pharma. V Sem.**
Subject: **Pharmaceutical Chemistry –V (Biochemistry)**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **70**
Minimum number of class tests to be conducted: **2**

Branch: **Pharmacy**
Code: **341512 (41)**
Total Tutorial Periods: **12**

Biochemical organization of the cell and transport processes across cell membrane.

The concept of free energy, determination of charges in free energy system from equilibrium constant and reduction potential, bioenergetics, production of ATP and its biological significance.

Enzymes: Nomenclature, Kinetics and its Mechanism of action, Mechanism of Inhibition, Isoenzymes, enzymes in technical diagnosis.

Co-enzymes: Metals as coenzymes and their significance and Vitamins as coenzymes and their significance.

Carbohydrate Metabolism: Conversion of Polysaccharide to Glucose 1-Phosphate, Glycolysis and Fermentation and their regulation, Gluconeogenesis and Glycogenolysis, metabolism of galactose and galactosemia, role of sugar nucleotide in biosynthesis, pentosephosphate pathway.

The Citric acid cycle: The significance, reaction and energetics of cycle, amphibolic role of cycle, Glyoxalic Acid Cycle.

Lipid Metabolism: Oxidation of fatty acids, Beta Oxidation and energetic, alpha oxidation, omega oxidation, Biosynthesis of Ketone bodies and their utilisation, Biosynthesis of saturated and unsaturated fatty acids and eicosanoids, phospholipids, sphingolipids.

Biological oxidation:

Redox Potential, enzymes and co-enzymes involved in oxidation-reduction and its control. The respiratory chain, its role in energy capture and its control, energetic of oxidative phosphorylation, inhibitors of respiratory chain and oxidative phosphorylation, mechanism of oxidative phosphorylation.

Nitrogen & Sulphur Cycle: Nitrogen fixation, ammonia assimilation, sulphur activation, sulphate reduction, incorporation of sulphur in organic compounds, release of sulphur from organic compounds

Metabolism of Ammonia and Nitrogen Containing monomers:

Nitrogen balance, biosynthesis of amino acids, catabolism of amino acids, conversion of amino acids to specialized products, assimilation of ammonia, urea cycle, metabolic disorders of urea cycle, metabolism biosynthesis, formation of bile pigment, hyperbilirubinemia, purine biosynthesis, purine nucleotide interconversion, pyrimidine biosynthesis, and formation of deoxyribonucleotides.

Biosynthesis of nucleic Acids:

Brief introduction to genetic organisation, organisation of mammalian genome, alteration and rearrangement of genetic material, biosynthesis of DNA and its replication, mutation, physical and chemical mutagenesis/ carcinogenesis, DNA repair mechanism, biosynthesis of RNA.

Genetic code and Protein synthesis: Genetic code, Components of protein synthesis and inhibition of protein synthesis. Brief account of genetic engineering and polymerase chain reactions. Regulation of gene expression.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **B. Pharma. V Sem.**

Subject: **Pharmaceutical Chemistry –VI (Medicinal Chemistry – I)**

Total Theory Periods: **50**

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

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

Branch: **Pharmacy**

Code: **341513 (41)**

Total Tutorial Periods: **12**

Introduction:

Basic principles of medicinal chemistry, physicochemical and stearic aspects (optimal, geometric and bioisosterism) of drug molecules and biological actions.

Drug Metabolism and Prodrug Concept

Drug receptor interaction including transduction mechanism and G proteins. The synthesis of the selected drugs, classification and mode of action, uses, SAR including physicochemical and stearic aspects of the following category of drugs:

(A) Drugs acting at synaptic and narrow effector junction sites

1. Cholinergics and Anticholinesterases.
2. Adrenergic hormones and Drugs;
3. Neuromuscular Blocking Agent.
4. Local Anaesthetics.

(B) Autocoids

1. Antihistamines.
2. Euiconosoids.
3. Non-steroidal anti-inflammatory agents, analgesic antipuretics.

(C) Vitamins:

Vitamin A, Thiamine, Riboflavin, Folic Acid, Niacin, Panthotenic Acid, Pyridoxine, Cyanocobalamine, Vitamin C, Vitamin D, Vitamin E, Vitamin K.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **B. Pharma. V Sem.**

Subject: **Pharmacognosy –III**

Total Theory Periods: **50**

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

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

Branch: **Pharmacy**

Code: **341514 (41)**

Total Tutorial Period – **12**

General techniques of biosynthetic studies and basic metabolic pathways. Introduction to biosynthesis of secondary metabolites of pharmaceutical importance. A brief introduction of chemical nature of phytoconstituents.

Radio – tracer techniques and utilization in biogenetic studies.

Phytochemical Screening: Preparation of extracts and different methods used for screening extracts for the presence of alkaloids, saponins, steroidal compounds, flavanoids, anthraquinones, phenolics, amino acids, etc.

Concepts of stereoisomerisms taking examples of natural products. Nature, distribution, classification, general methods of isolation and properties of alkaloids and terpenoids.

Chemistry, biogenesis and pharmacological activity of atropine, reserpine, ephedrine, ergometrine, quinine, morphine, digitoxin, sennosides, diosgenin, sarsapogenin, menthol, citral, taxol, rutin and artemisine.

Systematic pharmacognostical study of drugs like; Tobacco, Belladonna, Hyoscyamus, Datura, Coca, Withania, Cinchona, Ipecac, Opium, Ergot, Rauwolfia, Vinca, Nuxvomica, Physostigma, Pilocarpus, Veretrum, Kurchi, Ephedra, Solanam, Tea, Colchicum, etc.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **B. Pharma. V Sem.**

Subject: **Pharmacology -I**

Total Theory Periods: **50**

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

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

Branch: **Pharmacy**

Code: **341515 (41)**

Total Tutorial Period - **12**

General Pharmacology

- a. Introduction to pharmacology, sources of drugs, dosage forms and routes of administration, mechanism of action, combined effects of drugs, factors modifying drug action, tolerance and dependence, pharmacogenetics.
- b. Absorption, distribution and excretion of drugs, principle of basic and clinical pharmacokinetics adverse drug reactions and treatment of poisoning, ADME drug interaction, bioassay of drugs and biological standardization, discovery and development of new drugs.

Pharmacology of Peripheral Nervous System:

- a. Neurohumoral transmission (autonomous and somatic)
- b. Parasympathomimetic, parasympatholytic, sympathomimetics, adrenergic receptors and neuron blocking agents.
- c. Neuromuscular blocking agents
- d. Local anaesthetic agents

Autocoids

- a. Histamine, 5- HT and their antagonists.
- b. Prostaglandins, Thromboxanes and Leukotrienes.
- c. Pentagastrins, Cholecystokinin and Angiotensin.

Analgesic, Antipyretic, Anti-inflammatory and Anti-Gout Drugs:

Drugs acting on Respiratory System and Pathophysiology of respiratory system:

- a. Anti-asthmatic drugs including bronchodilators
- b. Anti-tussives and expectorants
- c. Respiratory stimulants

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **B. Pharma. V Sem.**

Subject: **Pharmaceutics – VII (Cosmetic Technology) Lab**

Total Practical Periods: **40**

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

Branch: **Pharmacy**

Code: **341521 (41)**

Experiments to be performed:

- Exp.1 - To study the structure & functions of skin & hair.
- Exp.2 - Prepare & submit talcum powder.
- Exp.3 - Prepare & submit face powder.
- Exp.4 - Prepare & submit vanishing cream.
- Exp.5 - Prepare & submit moisturizing cream.
- Exp.6 - Prepare & submit bleaching cream.
- Exp.7 - Prepare & submit anti sun burn cream.
- Exp.8 - Prepare & submit lather shaving cream.
- Exp.9 - Prepare & submit after shave lotion.
- Exp.10 - Prepare & submit hair shampoo.
- Exp.11 - Prepare & submit hair creams.
- Exp.12 - Prepare & submit tooth powder & tooth paste.
- Exp.13 - Prepare & submit athlete's foot preparation.
- Exp.14 - Prepare & submit nail polish.
- Exp.15 - Prepare & submit herbal cosmetics containing Aloe, Haldi, Mehndi & Amla.

Reference / Recommend Books:

1. **Harry's cosmeticology**
2. **Sagarin & Balsam, M.S. cosmetic Science and Technology, Vol. 1-3, John Wiley & Sons, NY, USA**
3. **Mac Chesney, J.C. Packaging of Cosmetic and Toiletries, Newsness Butterworth, London.**
4. **Jellinek, J.S., Formulation and Functions of Cosmetics, John Willey & sons, New York.**
5. **Thomssen, SG., Modern Cosmetics, Universal Publishing corporation, Bombay.**

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **B. Pharma. V Sem.**

Subject: **Pharmaceutical Chemistry –V (Biochemistry) Lab**

Total Practical Periods: **40**

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

Branch: **Pharmacy**

Code: **341522 (41)**

Experiments to be performed

- Exp.1 - Qualitative & Quantitative chemical examination of urine, blood & faeces.
- Exp.2 - Food analysis – analysis of milk, butter, flour, honey and starch.
- Exp.3 - Qualitative test for protein.
- Exp.4 - Qualitative test for carbohydrate.
- Exp.5 - To determine the Km value for the Beta -amylase.
- Exp.6 - Estimation of Vitamin C by potassium iodate method.
- Exp.7 - To perform the test for normal & abnormal constituents present in given sample.
- Exp.8 - To determine titrable acidity of ammonia in urine.
- Exp.9 - Estimation of protein by Biuret method.
- Exp.10 - Quantitative estimation of amino acids.
- Exp.11 - Separation of lipids by thin layer chromatography.
- Exp.12 - Separation of Amino acids by two dimensional paper chromatography & gel electrophoresis.
- Exp.13 - Separation of serum proteins by electrophoresis on cellulose acetate.
- Exp.14 - Quantitative estimation of reducing sugar (Glucose) in urine.
- Exp.15 - Isolation & determination of DNA & RNA.
- Exp.16 - Perform the liver function tests.

Reference / Recommend Books:

1. **Principles of Biochemistry – White, Smith & Handler Latest edition, Tata McGraw Hill**
2. **Principles of Biochemistry by A.L. Lehninger, Worth Publishers, Inc Latest Edition.**
3. **Harpers Biochemistry – Prentice Hall International Inc. Latest Edition.**
4. **Text Book of Biochemistry by West & Todd.**
5. **Fundamentals of Biochemistry by Dr. A.C. Deb, Sixth edition, Reprint – 1997, New Central Book Agency (P) Ltd., Calcutta.**
6. **Lehninger, A.L., Principles of Biochemistry, CBS Publishers and Distributors.**

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **B. Pharma. V Sem.**

Branch: **Pharmacy**

Subject: **Pharmaceutical Chemistry –VI (Medicinal Chemistry-I) Lab** Code: **341523 (41)**

Total Practical Periods: **40**

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

Experiments to be Performed

- Exp.1 - To prepare phthalimide from phthalic anhydride.
- Exp.2 - Prepare & submit phthalide from phthalimide.
- Exp.3 - Prepare & submit flurocin from phthalic anhydride.
- Exp.4 - Prepare & submit benzoyl chloride of benzoin.
- Exp.5 - Prepare & submit benzoic acid from benzoin.
- Exp.6 - Establishing the pharmacopoeial standards of the drugs synthesized.

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, Pergamon Press, Oxford.**
4. **Delgado, 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. V Sem.**
Subject: **Pharmacognosy –III Lab**
Total Practical Periods: **40**
Total Marks in End Semester Exam: **60**

Branch: **Pharmacy**
Code: **341524 (41)**

Experiments to be Performed

- Exp.1 - To study the Macroscopic & Microscopic character of Datura.
- Exp.2 - To study the Macroscopic & Microscopic character of Withania.
- Exp.3 - To study the Macroscopic & Microscopic character of Cinchona.
- Exp.4 - To study the Macroscopic & Microscopic character of Rauwolfia.
- Exp.5 - To study the Macroscopic & Microscopic character of Vinca.
- Exp.6 - To study the Macroscopic & Microscopic character of Nuxvomica.
- Exp.7 - To study the Macroscopic & Microscopic character of Kurchi.
- Exp.8 - To study the Macroscopic & Microscopic character of Ephedra.
- Exp.9 - To study the Macroscopic & Microscopic character of Tea.
- Exp.10 - To study the Macroscopic & Microscopic character of Ipecac.
- Exp.11 - Isolate various types of alkaloids from the drugs from course contents.
- Exp.12 - Isolate various type of saponines from the drug's from course contents.
- Exp.13 - Isolate various of flavonoids from the drugs from course contents.
- Exp.14 - Chemical evaluation of powder drugs.

Reference / Recommend Books:

1. **Trease, G.E. and Evans, W.C., Pharmacognosy, Bailliere Tindall, Eastbourne, U.K.**
2. **Tayler, V.C., Brady, L.R. and Robers, J.E., Pharmacognosy, Lea and febiger, Philadelphia**
3. **Shah, C.S. and Quar\dry, J.S. A text book of Pharmacognosy, B.S. Shah Publishers, Ahmedabad.**
4. **Kokate, C.K., Purohit, A.P., and Gokhale, S.B., Pharmacognosy, Nirali Prakashan, Pune.**
5. **Wallis, T.E. Text Book of Pharmacognosy, Jand A Churchill Limited, London.**

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **B. Pharma. V Sem.**
Subject: **Pharmacology -I Lab**
Total Practical Periods: **40**
Total Marks in End Semester Exam: **60**

Branch: **Pharmacy**
Code: **341525(41)**

Experiments to be Performed

- Exp.1 - Study the student organ bath.
- Exp.2 - Draw & study the different types of recording levers
- Exp.3 - Study the different type of recordings procedures.
- Exp.4 - Preparation of standard drug solution of the experiment.
- Exp.5 - Preparation of physiological salt solution for the experiment.
- Exp.6 - Study of the different types of experimental animals.
- Exp.7 - Draw & study to the animal house equipments.
- Exp.8 - Study the techniques of holding the animals.
- Exp.9 - Study the mode of administration of drugs of the animals.
- Exp.10 - Study of common laboratory anaesthetics used in animal study.
- Exp.11 - Study the effect of acetylcholine and adrenaline on frogs heart.
- Exp.12 - Effect of acetylcolin on rectus abdominus muscle of frog.
- Exp.13 - Effect of local anaesthetics on rabbit cornea.
- Exp.14 - Study the effect of convulsants and anti convulsants in mice.
- Exp.15 - To record C.R.C of Histamin and guinea pig ileum preparations.

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. **Tripathis, K.D., Essentials of Medecal Pharmcology.**
4. **Rang, M.P. Dale, M.M. and Riter, J.M, Pharmacology, Churchil Livingstone.**