

**CHHATTISGARH SWAMI VEVEKANAND TECHNICAL UNIVERSITY,
BHIALI**

**Scheme of Teaching and Examination
Bachelor of Pharmacy
VII – 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	341711(41)	Pharmaceutics IX (Pharmaceutical Technology I)	4	1	-	70	20	10	100	5
2	Pharmacy	341712(41)	Pharmaceutics X (Pharmaceutical Jurisprudence)	4	1	-	70	20	10	100	5
3	Pharmacy	341713(41)	Pharmaceutical Chemistry VIII(Medicinal Chemistry-III)	4	1	-	70	20	10	100	5
4	Pharmacy	341714(41)	Pharmacognosy IV	4	1	-	70	20	10	100	5
5	Pharmacy	341715(41)	Pharmacology III	3	1	-	70	20	10	100	4
6	Pharmacy	341721(41)	Pharmaceutics IX (Pharmaceutical Technology I) Lab	-		4	60	-	40	100	2
7	Pharmacy	341722(41)	Pharmacognosy IV Lab	-		4	60	-	40	100	2
8	Pharmacy	341723(41)	Pharmacology III Lab	-		4	60	-	40	100	2
9	Pharmacy	341724 (41)	Minor Project	-	-	4	70	-	30	100	2
Total				19	5	16	600	100	200	900	32

Minimum Pass Marks:

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

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

Duration of Theory Papers: 3 Hours.

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Semester: **B. Pharma. VII Sem.**

Subject: **Pharmaceutics -IX (Pharmaceutical Technology –I)**

Total Theory Periods: **50**

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

Minimum number of class tests to be conducted: 2

Branch: **Pharmacy**

Code: **341711 (41)**

Total Tutorial Period - **12**

Formulation considerations, technology involved, equipment (machine) employed, layouts, problems to be encountered, packaging and evaluation of following dosage forms.

1. Solid Dosage Forms- Tablets, Tablets coatings and Capsules.
2. Liquid Dosage Forms- Liquid Orals, Dry Syrups.
3. Semisolid Dosage Forms- ointments, Creams, Suppositories, Gels.
4. Sterile Dosage Forms- Parenteral (Small Volume Parenterals & Large Volume Parenterals) and ophthalmic Preparations.
5. Pharmaceutical Aerosols

Requirements of GMP and cGMP and Regulatory controls.

Blood Products and Plasma Substitutes:

Collection, processing and storage of whole human blood, concentrated human RBC, dried human plasma, human normal immunoglobulin, plasma substitutes, ideal requirements, PVP, Dextran, etc. for control of blood pressure,

Surgical products:

Definition, surgical cotton, surgical gauzes, bandages, adhesive tapes, absorbable and non absorbable sutures, ligatures and catguts, Medical prosthetics and organ replacement materials.

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Semester: **B. Pharma. VII Sem.**

Branch: **Pharmacy**

Subject: **Pharmaceutics -X (Pharmaceutical Jurisprudence)**

Code: **341712 (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**

A brief review of drug and pharmaceutical industries and drug legislation in India.

An elaborate study of the following:

- a) Pharmacy act
- b) Drugs and Cosmetics Act and Rules
- c) Medicinal and toilet preparations (excise duties) act and rules
- d) Narcotic drugs and psychotropic substances act and rules
- e) Essential commodities and drug price control order-new drug policy
- f) Drugs and magic remedies (objectionable advertisement) act

A brief study of the following:

- a) Poisons act and rules
- b) Medical termination of pregnancy act and rules
- c) Prevention of cruelty to animals act
- d) State shops and establishments act and rules
- e) Insecticides act
- f) AICTE act
- g) Factory act
- h) Minimum wages act
- i) Patent act

A brief study of various prescription / non-prescription products, Medical / Surgical accessories, diagnostic aids, appliances available in the market.

Note: Latest amendments of all the above acts and rules should be covered.

Reference / Recommend Books:

1. Jain, N.K., Text Book of Forensic Pharmacy, Vallabh Prakashan, New Delhi.
2. Mithal, B.M., Text Book of Forensic Pharmacy, national Book Depot, Calcutta.
3. Report of Drug Enquiry Committee.
4. Bare Acts Pertaining to Syllabus.

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Semester: **B. Pharma. VII Sem.**

Branch: **Pharmacy**

Subject: **Pharmaceutical Chemistry -VIII (Medicinal Chemistry – III)**

Code: **341713 (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 the selected drugs, mode of action, classification, uses, SAR of the following category of drugs:

- A) Steroids and related drugs. Steroidal nomenclature and stereochemistry, androgen and anabolic agents, estrogens and progestational agents adrenocorticoids.
- B) Diuretics and cardiovascular drugs.
- C) Antimetabolites (including sulphonamides).
- D) Chemotherapeutic Agents.
- E) Anti-viral Agents.
- F) Immuno- suppressive and anti HIV agents.
- G) Amino acids, Proteins and peptide hormones.
- H) Anti-neoplastic agents.
- I) Thyroid and Antithyroid Drugs.
- J) Insulin and Oral hypoglycemic agents.
- K) Drugs affecting uterine motility, oxytocins (including prostoglandins and Ergot alkaloids).

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. Delagado, J.N. and Remers, W.A.R, Wilson and Giswold's Text Book of Organic, Medicinal and Pharmaceutical Chemistry, J.Lippincott Co., Philadelphia.
4. Nogrady, T., Medicinal Chemistry-A Biochemical Approach, Oxford University Press, New York, Oxford.
5. Kar, A., Medicinal Chemistry, Willey Eastern Ltd., New Delhi.
6. Patrick, G., An Introduction to Medicinal Chemistry, Scientific Distributors, Mumbai.
7. Malone, Dyson and Purey, May's Chemistry of Synthetic Drugs.
8. Parimoo, P., Text Book of Medicinal Chemistry, CBS Publishers and Distributors, New Delhi.

***CHHATTISGARH SWAMI VEVEKANAND TECHNICAL UNIVERSITY,
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Semester: **B. Pharma. VII Sem.**

Branch: **Pharmacy**

Subject: **Pharmacognosy -IV**

Code: **341714 (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**

General introduction, classification and brief description of different chromatographic techniques with detailed emphasis on application of TLC, HPLC and HPTLC in the evaluation of herbal drugs including finger printing methods.

Industrial production and analysis (assay in natural sources, extracts and products) of phytoconstituents of pharmaceutical importance like; Quinine, Calcium Sennosides, Podophyllotoxin, Taxol, Artemisine, Diosgenin, Atropine, Ergometrine, Digoxine, Papain Glycerrhetic acid Morphine, Vincristine, Ephedrine.

Utilization of aromatic plants and derived products with special reference to isolation of Sandalwood oil, Mentha oil, Vetiver oil, Eucalyptus oil and Lemongrass oil.

Historical development of plant tissue culture, their types, nutritional requirements, growth and maintenance. Application of PTC in Pharmacy.

An introduction of marine Pharmacognosy and novel agents from marine sources. Herbs as health foods.

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Semester: **B. Pharma. VII Sem.**

Branch: **Pharmacy**

Subject: **Pharmacology -III**

Code: **341715 (41)**

Total Theory Periods: **40**

Total Tutorial Period - **12**

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

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

Pharmacology and Pathophysiology of Cardiovascular System –

- a) Digitalis and Cardiac glycosides.
- b) Antihypertensive drugs.
- c) Antianginal and Vasodilator drugs including Calcium channel blockers and β -adrenergic antagonists.
- d) Antiarrhythmic drugs.
- e) Antihyperlipidemic drugs.
- f) Drugs used in the therapy of shock.

Drugs Acting on the urinary System –

Diuretics, fluid and electrolyte balance.

Pharmacology and Pathophysiology of Endocrine System –

Hypothalamic and pituitary hormones. Thyroid hormones and antithyroid drugs, parathormone, calcitonin and vitamin D

Insulin, oral hypoglycemic agents and glucagon.

- a) ACTH and Corticosteroids.
- b) Estrogens, anti-oestrogens, progestins and oral contraceptives.
- c) Androgens and anabolic steroids.
- d) Drugs acting on the uterus.

Chemotherapy and Cardiovascular System –

- 1. General principles of chemotherapy
- 2. Sulfonamides and co-trimoxazole
- 3. Antibiotics-Penicillin, Cephalosporins, Betalactumstetracyclines, Aminoglycosides, Chloramphenicol, Erythromycin, Quinolones and Miscellaneous antibiotics.
- 4. Chemotherapy of tuberculosis, leprosy, fungal diastase, viral diseases, urinary tract infections and sexually transmitted diseases
- 5. Chemotherapy of malignancy and immunosuppressive agents

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Semester: **B. Pharma. VII Sem.**

Subject : **Quality Assurance And Pacakaging Technology:**

Total Theory Periods: **40**

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

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

Branch: **Pharmacy**

Code: **3417631 (41)**

Total Tutorial Period - **12**

- A) Quality control and Quality assurance. Sources and control of quality variation. Control and assurance of manufacturing practices and finished products. Quality assurance during Packaging operation.
- B) New concepts in pharmaceutical packaging. Packaging materials with special reference to polymers, metals glass and plastics, control of packaging materials. Control of packaging materials.
- C) Blister and Strip packaging. Testing of containers and closures, Pharmacopoeial tests and specifications. Defects in Packages. Stability of packages and packaging materials.
- D) Sterilization of pacakaging materials. Packaging of parenterals, ophthalmic and aerosols. Legal requirement.

***CHHATTISGARH SWAMI VEVEKANAND TECHNICAL UNIVERSITY,
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Semester: **B. Pharma. VII Sem.**

Subject : **Drug Regulatory Affairs And Therapeutic Drug
Monitoring:**

Total Theory Periods: **40**

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

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

Branch: **Pharmacy**

Code: **3417632 (41)**

Total Tutorial Period - **12**

History of the Federal Food Drug and Cosmetic Act.

Definition of drug, New drug, Label, New animal drug under the Federal Food, Drug and Cosmetic act.

New drug, NDA, ANDA, SNDA, Recalls, GMP, FDA.

Intellectual and Industrial property. Patent

Information resources in pharmacy and the Pharmaceutical Sciences. Drug literature, Clinical analysis.

Bioavailability and Bioequivalence testing, Adverse Drug Reaction and its monitoring. Drug interactions, Drug abuse. Design of dosage Regimens.

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Semester: **B. Pharma. VII Sem.**

Branch: **Pharmacy**

Subject: **Pharmaceutics – IX (Pharmaceutical Technology – I) Lab** Code: **341721 (41)**

Total Practical Periods: **50**

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

Experiments to be Performed :

- Exp.1 -Prepare & submit effervescent granules.
- Exp.2 -Prepare Aspirin tablets by wet granulation method & evaluate.
- Exp.3 -Prepare capsule by different type & its evaluate.
- Exp.4 -To study the effect of pH on stability of Aspirin.
- Exp.5 - Prepare tablets by direct compression method.
- Exp.6 -Prepare & submit ophthalmic preparation
- Exp.7 - Evaluation and comparison of marketed dosage form
- Exp.8 - Moisture peak up study of some marketed product
- Exp. 9 -Determine the effect of different concentration of binder (3%, 5% and 10 % of povidone and starch paste)on the hardness and dissolution rate of ascorbic tablet.

Reference / Recommend Books:

1. **Rawlins, E.A., Text Book of Pharmaceutics, Baillier Tindall.**
2. **Lachman L., Liberman, H.A. and Kanig, J.L., The Theory and Practice of Industrial Pharmacy, Lea and Febiger, Philadelphia.**
3. **Pharmacopoeia of India, Ministry of Health and family Welfare, Govt. of India, New Delhi.**
4. **Banker G.S. and Rhode C.T., Modern Pharmaceutics, Marcell Decker Inc., New York.**
5. **S.J. Carter's tutorial Pharmacy, CBS Publication, New Delhi.**
6. **Reminton's The Science and practice of Pharmacy, 20th Edition, Vol. I & II, Published by Philadelphia College of Pharmacy and Science**

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Semester: **B. Pharma. VII Sem.**

Branch: **Pharmacy**

Subject: **Pharmacognosy – IV Lab**

Code: **341722 (41)**

Total Practical Periods: **50**

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

Experiments to be Performed :

- Exp.1 - Isolation of nicotine from tobacco.
- Exp.2 - Isolation of caffeine from tea leaves.
- Exp.3 - Isolation of piperine from black pepper.
- Exp.4 - Isolation of ammonium glycyrrhizinate from liquorice root.
- Exp.5 - Isolation of sennoside from senna leaves in form of calcium salt.
- Exp.6 - Extract salutarin from potato tubers.
- Exp.7 - Isolation of atropin from datura leaves.
- Exp.8 - Evaluation of herbal drug preparation using the TLC & paper chromatography.
- Exp.9 - Isolation of mentha oil.
- Exp.10 - Isolation of eucalyptus oil.
- Exp.11 - Isolation of Aloin from Aloe.
- Exp.12 - Determine vein state and veinlet termination number of given sample of leaf (datura).
- Exp.13 - Determination of moisture content of the given sample (senna).
- Exp.14 - Determine the foaming index of given drug pipripiper longam.
- Exp.15 - Determine the Alcohol soluble extract value of the given sample.
- Exp.16 - Determination of hemolytic index value .
- Exp.17 - Perform TLC of given sample.
- Exp.18 - Determine the Saponification value of given sample.

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.

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Semester: **B. Pharma. VII SEM.**

Branch: **Pharmacy**

Subject: **Pharmacology - III Lab**

Code: **341723 (41)**

Total Practical Periods: **50**

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

Experiments to be performed:

- Exp.1 - To study the cardiovascular system of frog.
- Exp.2 - To study the cardiovascular system of Rabbit.
- Exp.3 - To study the cardiovascular system human being.
- Exp.4 - To draw and study the electrocardiograph.
- Exp.5 - To study the inotropic and chronotropic effects of drugs on isolated frog heart.
- Exp.6 - To study the effects of drugs on normal and hypodynamic frog heart.
- Exp.7 - To study the effect of noradrenaline, acetylcholine and isoprenaline on the coronary blood flow of rat isolated heart.
- Exp.8 - To study the noradrenaline acetylcholine and isoprenaline on the heart rat using rat isolated heart.
- Exp.9 - To record the effect of acetylcholine and noradrenaline on the blood pressure.
- Exp.10 - To record the effector acetylcholine and noradrenaline on the blood pressure and electrocardiography of an anaesthetized rat.
- Exp.11 - To demonstrate the effect of adrenaline noradrenaline isoprenaline and acetylcholine on the blood pressure of anaesthetized dog.
- Exp.12 - To study the effects of blockers on isolated from heart.
- Exp.13 - To study the chlorothiazide and spironolactone on the excretion of urine.
- Exp.14 - To record the CRC of oxytocin using rat uterus preparation.
- Exp.15 - To study the endocrine system.

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 Medeical Pharmcology.
4. Rang, M.P. Dale, M.M. and Riter, J.M, Pharmacology, Churchil 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