

Chhattisgarh Swami Vivekanand Technical University

B. Pharmacy First Year

FIRST SEMESTER, (New) from 2012 – 13

S.No.	Subject Code No.	Board of Studies	Subject	Periods Per Week			Scheme of Examination			Total Marks	Credit= L+[T+P] /2
							Theory/Practical				
				L	T	P	ESE	CT	TA		
1	341116(41)	Pharmacy	Pharmaceutics-I (Introduction to Pharmaceutics)	4	1	-	70	20	10	100	5
2	341117(41)	Pharmacy	Pharmaceutical Chemistry- I (Inorganic)	4	1	-	70	20	10	100	5
3	341118(41)	Pharmacy	Pharmacognosy- I	4	1	-	70	20	10	100	5
4	341119(41)	Pharmacy	Anatomy, Physiology and Health Education- I (APHE-I)	4	1	-	70	20	10	100	5
5	341110(41)	Pharmacy	Pharmaceutical Chemistry- II (Organic Chemistry- 1)	4	1	-	70	20	10	100	5
6	341126(41)	Pharmacy	Pharmaceutics-I (Introduction to Pharmaceutics) Practical	-	-	3	60	-	40	100	2
7	341127(41)	Pharmacy	Pharmaceutical Chemistry- I (Inorganic) Practical	-	-	3	60	-	40	100	2
8	341128(41)	Pharmacy	Pharmacognosy- I Practical	-	-	3	60	-	40	100	2
9	341129(41)	Pharmacy	Anatomy Physiology and Health Education- I (APHE-I) Practical	-	-	3	60	-	40	100	2
10	341120(41)	Pharmacy	Workshop	-	-	3	60	-	40	100	2
TOTAL				20	5	15	650	100	250	1000	35

Min. Pass Marks: (A) Theory ESE & TA+CT (Combined): 50%, (B) Practical ESE & TA (Combined): 50%

L- Lecture, T- Tutorial, P- Practical, ESE- End Semester Exam, TA - Teacher's Assessment

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Subject: Pharmaceutics-I (Introduction to Pharmaceutics)

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341116(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

1.1. Evolution of Pharmacy and Pharmaceutical Literature: History and scope of Pharmacy, Historical background and importance of Indian Pharmacopoeia, British Pharmacopoeia and United State Pharmacopoeia. Introduction and classification of pharmaceutical dosage form.

1.2. Pharmacopoeial Preparations: Principles and methods of preparation of aromatic waters, spirits, elixirs, linctuses, solutions, inhalations.

Module: 2 (8 Hrs.)

2.1. Prescription: Various parts of prescription and their functions, handling of prescriptions, sources of errors, care required in dispensing procedures including labelling of dispensed products. Preliminary knowledge of important Latin terms used in prescriptions and their translation into English.

2.2 Incompatibilities: Definition of incompatibility, Types of incompatibility (Physical, Chemical and Therapeutic), Study of prescriptions containing incompatibilities, correction and dispensing methods.

Module: 3 (8 Hrs.)

3.1. Principles and procedures of dispensing prescriptions: Principles involved and procedures adopted in dispensing of liquid preparations such as mixtures, suspensions, emulsions, lotions, and liniments; semisolid preparations such as ointments, creams, pastes, jellies and suppositories; solid dosage forms such as powders, capsules, effervescent powders, tablet triturates and lozenges.

Module: 4 (8 Hrs.)

4.1. Pharmaceutical calculations and metrology: Metric and Imperial systems of weights and measures used in prescriptions, Posology, Calculations of doses for infants, children, and elderly patients; reducing and enlarging of formulae; percentage of solutions; allegation method; proof spirits; calculations involving alcohol dilutions.

4.2. Routes of drug administration. Classification of dosage forms.

Module: 5 (8 Hrs.)

5.1. Galenicals: Principles and methods of extraction, preparation of infusions, decoctions, tinctures, liquid, soft and dry extracts.

Text Books/Reference Books (Latest Edition)

1. Ansel, H C, Introduction to Pharmaceutical Dosage Forms, K M Varghese & Co., Bombay.
2. D. K. Tripathi, Introduction to Pharmaceutics (Theory and Practice), Jaypee Brothers Medical Publisher, Pvt. Ltd., New Delhi.
3. A.R. Gennaro, Remington's "The Science and practice of Pharmacy", Lippincot, Williams and Wilkins, Philadelphia.
4. M.E. Aulton, "Pharmaceutics-The science of doses form design", Churchill Livingstone, London.
5. Banker and Rhodes, Modern Pharmaceutics. Marcel Dekker Inc. NY.
6. Kibbe, "Hand book of Pharmaceutical Excipients., Pharmaceutical Press, London.
7. N. K. Jain, Text Book of Professional Pharmacy, CBS Publishers & Distributors. New Delhi.
8. B. M. Mithal, Text Book of Pharmaceutical Formulation.
9. Loyd. V. Allen, Jr. Nicholas, G. Popovich, Howard C. Ansel, Pharmaceutical Dosage Forms & Drug Delivery System.
10. Bentley, E.A. Rawlins. Textbook of Pharmaceutics.

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Subject: Pharmaceutical Chemistry- I (Inorganic)

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341117(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

1.1 An outline of methods of preparation, uses, sources, of impurities, test for purity and identity including limit tests for iron, arsenic, lead, heavy metals, chloride, sulphate and special tests if any, of the following classes of inorganic pharmaceuticals listed in Indian Pharmacopoeia.

Module: 2 (8 Hrs.)

2.1 **Acids and Bases:** Buffers, Water.

2.2 **Gastrointestinal Agents:** Acidifying agents, Antacids, Protectives, and Absorbents, Cathartics.

Module: 3 (8 Hrs.)

3.1 **Major Intra and Extra Cellular Electrolytes:** Physiological cations, Electrolytes used for replacement therapy, acid-base balance and combination therapy.

3.2 **Essential and Trace Elements:** Transition elements and their compounds of pharmaceutical importance, Iron and haematinics, Mineral supplements.

3.3 Cationic and anionic components of inorganic drugs useful for systemic effects.

Module: 4 (8 Hrs.)

4.1 **Topical Agents:** Protectives, Astringents and Anti-infectives.

4.2 **Gases and Vapours:** Oxygen, Anaesthetics and respiratory stimulants.

4.3 **Dental Products:** Dentifrices, anti-caries agents.

Module: 5 (8 Hrs.)

5.1 Complexing and chelating agents used in therapy.

5.2 **Miscellaneous Agents:** Sclerosing agents, expectorants, emetics, poisons and antidotes, sedatives etc., pharmaceutical aids used in pharmaceutical industry antioxidants, preservatives, diluents, excipients, suspending agents, colorants, filter aids, adsorbents etc.

5.3 **Inorganic radio-pharmaceuticals:** Nuclear radiopharmaceuticals, units of activity, measurement of activity, clinical applications and dosage, hazards and precautions.

Text Books/Reference Books (Latest Edition)

1. Block J H, Roche E, Soine T O and Wilson C O, Inorganic Medicinal and Pharmaceutical Chemistry, Lea and Febiger, Philadelphia, P A. Brey W S,
2. Diseher L A, Modern Inorganic Pharmaceutical Chemistry. Eliel E L,
3. Chatwak, Inorganic Pharmaceutical Chemistry
4. Md. Ali, Inorganic Pharmaceutical Chemistry
5. Choudary and Gurbani, Inorganic Pharmaceutical Chemistry
6. Kadri and Kadri, Inorganic Pharmaceutical Chemistry
7. S.N. Pande, Inorganic Pharmaceutical Chemistry
8. David G. Watson, Pharmaceutical Analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists, Elsevier Health Sciences, 2012
9. Alfonso R. Gennaro (Editor), Remington: The Science and Practice of Pharmacy, 19th edition (Two Vols.), Williams & Wilkins, 1995

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Subject: Pharmacognosy- I

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341118(41)

Total Tut. Periods: 12

Module: 1 (6 Hrs.)

1.1 Introduction: A brief Introduction to plant kingdom, plant cell and tissues. Definition, history, scope and development of Pharmacognosy..

Module: 2 (6 Hrs.)

2.1 Classification of drugs: Alphabetical, morphological, taxonomical, chemical, pharmacological and other novel methods of classification of drugs.

2.2 Sources of drugs: Biological, mineral and marine as sources of drugs.

Module: 3 (8 Hrs.)

3.1 Study of the following families with special reference to medicinally important plants–Apocynaceae (Vinca, Sargandha), Solanaceae (Belladonna, Datura, Tobacco), Umbelliferae (Fennel, Coriander, Carraway), Leguminosae (Senna, Fenugreek, Liquorice), Rubiaceae (Cinchona), Liliaceae (Onion, Asparagus, Aloe), Graminae (Cynodon dactylon, Ergot), Papaveraceae (Poppy).

Module: 4 (12 Hrs.)

4.1 Introduction: An introduction to active constituents of plants, their classification and properties.

4.2 Quality control of crude drugs: Adulteration of crude drugs and their detection by organoleptic, microscopic, physical, chemical and biological methods and properties.

Module: 5 (8 Hrs.)

5.1 Natural Fibres: Study of fibres used in pharmacy such as fibres, wool, glass wool, and asbestos.

5.2 Pharmaceutical aids: Definition, classification and study of some pharmaceutical aids of different category (Turmeric, saffron, Arachis oil, Agar, Guar gum, Acacia, Honey, Musk, Isabgol, Pectin, Starch, Tragacanth, Bees wax, Castor oil, Cocoa butter, Linseed oil and Wool fat).

Text Books/Reference Books (Latest Edition)

1. C. K. Kokate, A.P.Purohit, S.B. Gokhale, Text Book of Pharmacognosy, Nirali Prakashan, Pune.
2. G.E. Trease & W.C. Evans, Pharmacognosy, Saunders Elsevier.
3. T.E. Wallis Text Book of Pharmacognosy, CBS Publishers & Distributors, New Delhi, Darya Ganj.
4. V.E. Tyler, L.R. Brady & J.E. Robbers, Text Book of Pharmacognosy, Lea & Febiger, Philadelphia,
5. S.H. Ansari, Essential of Pharmacognosy, Birla Publication, Shahdara, New Delhi.
6. T. E. Wallis Analytical Microscopy, J&A Churchill Limited, London.
7. K.R. Brain and T.D Turner. "The Practical Evaluation of Phyto Pharmaceutical", Wright, Scientecnica- Bristol.
8. P, J. Schewer, Marine Natural products, Academic press, London.
9. Mohammed Ali. Pharmacognosy & Phytochemistry,

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Subject: Anatomy, Physiology and Health Education- I (APHE-I)

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341119(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

1.1. Introduction: A brief introduction to animal kingdom (taxonomical classification), Scope of anatomy and physiology and basic terminology used in these subjects. Structure of cell, its components and their functions.

Module: 2 (8 Hrs.)

2.1. Elementary tissues of the human body: Epithelial, Connective, Muscular and Nervous tissues, their sub types and characteristics.

2.2. Osseous System: Structure, composition and functions of skeleton, classification of joints, types of movements of joints, disorders of joints.

2.3. Skeletal Muscles: Gross anatomy and physiology of muscle contraction, physiological properties of skeletal muscles and their disorders.

Module: 3 (8 Hrs.)

3.1. Haemopoietic System : Composition and functions of blood and its elements, their disorders, blood groups and their significance, mechanism of coagulation, disorders of platelets and coagulation.

3.2. Lymph and Lymphatic System: Composition, formation and circulation of lymph; disorders of lymph and lymphatic system. Basic physiology and functions of spleen.

Module: 4 (8 Hrs.)

4.1. Cardiovascular System: Basic anatomy of the heart, physiology, blood vessels and circulation. Basic understanding of cardiac cycle, heart sounds and electrocardiogram. Brief outline of cardiovascular disorders like hypertension, hypotension, arteriosclerosis, angina, myocardial infarction, congestive cardiac failure and cardiac arrhythmias.

Module: 5 (8 Hrs.)

5.1. Digestive System: Gross anatomy of the gastro-intestinal tract, functions of its different parts including those of liver, pancreas and gall bladder, various gastrointestinal secretions and their role in the absorption and digestion of food. Disorders of digestive system.

Text Books/Reference Books (Latest Edition):

1. Ross & Willson Anatomy & Physiology in Health and Illness, Churchill Living Stone.
2. G.J., Tortora, S.R. Grabowski & N.P. Anagnodokos, Principle of Anatomy & Physiology, Willey.
3. S.K. Choudhury Concise Medical Physiology, New Central Book Agency, Latest Ed.
4. Guyton A.C, Hall J. E. W. B. Saunders Company, Text Book of Medical Physiology.
5. C. C. Chatterjee, Human Physiology (Vol-I & II), Medical Allied Agency, Latest Ed.

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Subject: Pharmaceutical Chemistry II (Organic chemistry -1)

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341110(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

Structure and Bonding, Atomic orbital, Hybridizations, Types of bonds, Bond lengths and bond angles, bond energy :van-der Waals interactions, inclusion compounds, charge transfer complex.

Module: 2 (8 Hrs.)

Types of Reagent, Electrophiles and nucleophiles.

Types of organic reactions (Substitution, Addition and elimination reaction).

Electron Displacement Effects: Inductive Effect, Mesomeric Effect, Electromeric Effect, Effect of Hyperconjugation. Homolytic bond fission, Heterolytic bond fission.

Module: 3 (8 Hrs.)

General rules for I.U.P.A.C. Nomenclature of Organic compounds.

Structure, Occurrence and Stability of Carbonium ions, Carbanion ions and Free radicals, Energy consideration.

Module: 4 (8 Hrs.)

Stereochemistry -I

Concept of isomerism, types of isomerism, optical isomerism, elements of symmetry, molecular chirality, enantiomers, stereogenic centers, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, distereoisomers, mesocompounds, resolution of enantiomers, inversion, retention and racemization.

Relative and absolute configurations, sequence rules, D & L , R & S systems of nomenclature.

Module: 5 (8 Hrs.)

Stereochemistry - II

Nomenclature E and Z system, geometrical isomerism in alicyclic compounds. Conformation, conformational analysis of ethane and n-butane. Conformations of cyclohexanes, axial and equatorial bonds, Newman projection and Saw horse formulae, Fischer and Flying wedge formulae.

Text Books/Reference Books (Latest Edition)

1. A guide book to mechanism in Organic chemistry (Orient-Longmens)- Peter Sykes
2. Organic reaction mechanism (Benjamin) R. Breslow
3. Mechanism and structure in Organic chemistry (Holt Reinh.) B. S. Gould.
4. Organic chemistry(McGraw-Hill)Hendrikson, Cram and Hammond.
5. Basic principles of Organic chemistry (Benjamin) J. D.Roberts and M. C. Caserio.
6. Reactive Intermediates in Organic chemistry (John Wiley) N. S. Issacs.
7. Stereochemistry of Carbon compounds. (McGraw-Hill) E.L.Eliel
8. Singh Harkishan and Kapoor, V.K., Organic Pharmaceutical Chemistry, Vallabh Prakashan, Delhi.
9. Morrison T R and Boyd R N, Organic Chemistry, Prentice Hall of India, Private limited, New Delhi.
10. Finar I L, Organic Chemistry, Vol. II ELBS/Longman, London. Foye W C,
11. O.P Agarwal, Reaction and Reagents.

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Branch: B. Pharmacy

Subject: Pharmaceutics-I (Introduction to Pharmaceutics) Lab.

Code: 341126(41)

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

List of Practical (A minimum of 20 experiments shall be conducted)

1. Study Indian Pharmacopoeia, British Pharmacopoeia, United States Pharmacopoeia.
2. To prepare and submit Camphor Water I.P.
3. To prepare and submit Chloroform Water I.P.
4. To prepare and submit Conc. Anise Water I.P.
5. To prepare and submit Aqueous Iodine Solution I.P.
6. To prepare and submit Weak Iodine Solution I.P.
7. To prepare and submit Strong Iodine Solution I.P.
8. To prepare and submit Simple Syrup I.P. and U.S.P
9. To prepare and submit Chloroform Spirit I.P.
10. To prepare Benzaldehyde spirit.
11. To prepare surgical spirit.
12. To prepare and submit Simple elixir I.P.
13. To prepare and submit Calamine Lotion I.P.
14. To prepare and submit Calamine Lotion USP, oily.
15. To prepare and submit Liquid Paraffin Emulsion I.P
16. To prepare and submit castor oil emulsion. I.P.
17. To prepare and submit Tragacanth Mucilage I.P.
18. To prepare and submit Milk of Magnesia I.P
19. To prepare and submit Bentonite Magma U.S.P.
20. To prepare and submit Borax Glycerin I.P.
21. To prepare and submit Simple Tinctures I.P.
22. To prepare and submit orange / lemon Tincture I.P.
23. To prepare and submit salicylic acid lotion BPC.
24. To prepare and submit liquid paraffin & magnesium hydroxide emulsion BPC.
25. To prepare and submit lubricating gel.
26. To prepare and submit Peppermint water IP.
27. To prepare and submit soap liniment.
28. To prepare and submit sodium alginate jelly.
29. To prepare and supply NaCl solution.
30. To prepare and supply benzoic acid solution.
31. To prepare and supply Sodium bi carbonate ear drop.
32. To prepare and supply Boric acid ear drop.
33. To prepare and supply phenol ear drop.
34. To prepare camphor liniment.
35. To prepare Turpentine liniment.
36. To prepare soap liniment.
37. To prepare calamine lotion.
38. To prepare cetrimide lotion.
39. To prepare gentian violet lotion.
40. To prepare simple ointment.
41. To prepare calamine ointment.
42. To prepare Ichthammol ointment.
43. To prepare chloral hydrate enema.
44. To prepare soap enema.
45. To prepare compound zinc paste.

46. To prepare NaCl mouthwash compound.
47. To prepare aqueous calamine cream.
48. To prepare vanishing cream.
49. Alligation problems

Text Books/Reference Books (Latest Edition):

1. Indian Pharmacopoeia, British Pharmacopoeia, United State Pharmacopoeia.
2. D. K. Tripathi, Introduction to Pharmaceutics (Theory and Practice), Jaypee Brothers Medical Publisher, Pvt. Ltd., New Delhi.
3. A.R. Gennaro, Remington's "The Science and practice of Pharmacy", Lippincot, Williams and Wilkins, Philadelphia.
4. M.E. Aulton, "Pharmaceutics-The science of doses form design", Churchill Livingstone, London.
5. Banker and Rhodes, Modern Pharmaceutics. Marcel Dekker Inc. NY.
6. Kibbe, "Hand book of Pharmaceutical Excipients., Pharmaceutical Press, London.
7. A. Martin, J Swarbrick, A Cammarata. Physical Pharmacy.
8. N. K. Jain, Text Book of Professional Pharmacy, CBS Publishers & Distributors. New Delhi.
9. N.K. Jain, Pharmaceutical product development, CBS Publishers & Distributors. New Delhi.
10. B. M. Mithal, Text Book of Pharmaceutical Formulation.
11. Loyd. V. Allen, Jr. Nicholas, G. Popovich, Howard C. Ansel, Pharmaceutical Dosage Forms & Drug Delivery System.
12. Bentley, E.A. Rawlins. Textbook of Pharmaceutics.

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Subject: Pharmaceutical Chemistry- I (Inorganic) Lab.

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

Branch: B. Pharmacy

Code: 341127(41)

List of Practical (A minimum of 10 experiments shall be conducted)

1. Limit test for chlorides in some Pharmacopoeial compounds including soluble, insoluble and colored substances.
2. Limit test for Sulphates in some Pharmacopoeial compounds including soluble, insoluble and colored substances.
3. Limit test for iron in some Pharmacopoeial compounds including soluble and insoluble substances.
4. Limit test for lead in some Pharmacopoeial compounds including soluble and insoluble substances.
5. Limit test for arsenic.
6. Identification and qualitative tests for cations & anions of given sample of Ammonium chloride.
7. Identification and qualitative tests for cations & anions of given sample of Magnesium sulphate.
8. Identification and qualitative tests for cations & anions of given sample of Ferrous Sulphate.
9. Identification and qualitative tests for cations & anions of given sample of Calcium carbonate.
10. Identification and qualitative tests for cations & anions of given sample of Zinc chloride.
11. Identification and qualitative tests for cations & anions of given sample of Ammonium sulphate.
12. Identification and qualitative tests for cations & anions of given sample of Zinc sulphate.
13. Preparation and identification tests of Ammonium hydroxide.
14. Preparation and identification tests of Alum.
15. Preparation and identification tests of Aluminium hydroxide.
16. Preparation and identification tests of Disodium hydrogen citrate.
17. Preparation and testing of purified water.

Text Books/ Reference Books (Latest Edition):

1. Block, Roche, Soine, Wilson, Inorganic Medicinal & Pharmaceutical Chemistry, Varghese Publishing House, Bombay.
2. Bentley & Driver, A Text Book of Pharmaceutical Chemistry, Oxford Medical Publication.
3. G. R. Chatwal, Pharmaceutical Chemistry- I (Inorganic), Himalaya Publishing House, New Delhi.
4. Pharmacopoeia of India, Ministry of Health, Govt. of India, New Delhi.
5. David G. Watson, Pharmaceutical Analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists, Elsevier Health Sciences, 2012
6. Alfonso R. Gennaro (Editor), Remington: The Science and Practice of Pharmacy, 19th edition (Two Vols.), Williams & Wilkins, 1995

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Subject: Pharmacognosy-I Lab.

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

Branch: B. Pharmacy

Code: 341128(41)

List of Practical (A minimum of 10 experiments shall be conducted)

1. Study of different types of microscopes, camera lucida, micrometers.
2. Determination of leaf constants such as stomatal index, stomatal number, vein-islet number, vein-termination number and palisade ratio, at least one drug (Senna, Datura, Vinca, Belladonna).
3. Preparation of herbarium sheets of plants studied in Plant taxonomy
4. Perform macroscopic examination (Morphology and Organoleptic) of some drugs mentioned in theory (at least ten drugs).
5. Perform microscopic measurements of cells and Cell contents:
 - a. Starch grains- Rice, Potato and Maize
 - b. Calcium oxalate crystals- Liquorice, Cinchona, Belladonna, Onion
 - c. Phloem fibers- Vinca, Sarpagandha, Cinchona
6. Perform microscopic examination of powder characteristics of some crude drugs, at least two drugs (Sarpagandha, Datura, Senna, Fenugreek, Cinchona).
7. Perform microscopic examination of Umbelliferous fruits (Fennel, Coriander, Carraway),
8. Perform General chemical tests for Carbohydrates, Lipids and Proteins.
9. Perform physical and chemical study of carbohydrate fibres (Cotton, Jute, Flax, Viscose, and Rayon).
10. Perform physical and chemical study of pharmaceutical aids, at least three drugs (Turmeric, Arachis oil, Agar, Acacia, Honey, Isabgol, Tragacanth, Bees wax, Wool fat).

Text Books/ Reference Books (Latest Edition):

1. C. K. Kokate, A.P.Purohit, S.B. Gokhale, Text Book of Pharmacognosy, Nirali Prakashan, Pune.
2. G.E. Trease & W.C. Evans, Pharmacognosy, Saunders Elsevier.
3. T.E. Wallis Text Book of Pharmacognosy, CBS Publishers & Distributors, New Delhi, Darya Ganj.
4. V.E. Tyler, L.R. Brady & J.E. Robbers, Text Book of Pharmacognosy, Lea & Febiger, Philadelphia,
5. S.H. Ansari, Essential of Pharmacognosy, Birla Publication, Shahdara, New Delhi.
6. T. E. Wallis Analytical Microscopy, J&A Churchill Limited, London.
7. K.R. Brain and T.D Turner. "The Practical Evaluation of Phyto Pharmaceutical", Wright, Scientecnica-Bristol.

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Branch: B. Pharmacy

Subject: Anatomy Physiology and Health Education-I Lab. (APHE-I) Lab. **Code:** 341129(41)

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

List of Practical (A minimum of 10 experiments shall be conducted)

1. Determine RBC count of own blood.
2. Determine WBC count of own blood.
3. Determine differential WBC count of own blood.
4. Determine platelets count of own blood.
5. Determine hemoglobin count of own blood.
6. Determine bleeding and clotting time of own blood.
7. Determine blood group of own blood.
8. Study of epithelial, connective, muscular and nervous tissue using slide.
9. Study human skeletal system with the help of chart, model and histological slides.
10. Study of human cardiovascular system with the help of chart, model and histological slides.
11. Record of blood pressure, blood temperature and pulse rate.
12. To understand ECG, PQRST waves and their significance.
13. Study of human digestive system with the help of chart, model and histological slides.
14. Study of lymphatic system with the help of chart, model and histological slides.

Text Books/Reference Books (Latest Edition):

1. Ross & Willson Anatomy & Physiology in Health and Illness, Churchill Living Stone.
2. G.J., Tortora, S.R. Grabowski & N.P. Anagnodokos, Principle of Anatomy & Physiology, Willey.
3. S.K. Choudhury Concise Medical Physiology, New Central Book Agency, Latest Ed.
4. Guyton A.C, Hall J. E. W. B. Saunders Company, Text Book of Medical Physiology.
5. C. C. Chatterjee, Human Physiology (Vol-I & II), Medical Allied Agency, Latest Ed.

Chhattisgarh Swami Vivekanand Technical University

Semester: 1st

Subject: Workshop

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

Branch: B. Pharmacy

Code: 341120(41)

1. Handling of glassware and Instruments (along with different type of pipettes and burettes).
2. Study and calibration of glasswares, weight box and fractional weight box.
3. Different weighing methods and working of analytical, physical balance and use of rider.
4. Washing and sterilization of laboratory glassware's
5. Preparation of general laboratory reagent and distilled water
6. Preparations of an exhibit file of any one type of dosage form.
7. Brief study of different pharmacopeias (IP,BP,USP,NF,BPC)
8. Study of periodic table

Text Books/Reference Books (Latest Edition)

1. Vogel's Textbook of Practical Organic Chemistry (5th Edition)
2. Beckett's Practical Pharmaceutical Chemistry, Part-I & II (4th Edition)
3. Indian Pharmacopoeia
4. National Formulary

Chhattisgarh Swami Vivekanand Technical University

B. Pharmacy First Year,

SECOND SEMESTER, (New)

S. No	Subject Code No.	Board of Studies	Subject	Periods Per Week			Scheme of Examination			Total Marks	Credit= L+[T+P] /2
				L	T	P	Theory				
							ESE	CT	TA		
1	341216(41)	Pharmacy	Pharmaceutics- II (Hospital and Community Pharmacy)	4	1	-	70	20	10	100	5
2	341217(41)	Pharmacy	Anatomy, Physiology and Health Education- II (APHE-II)	4	1	-	70	20	10	100	5
3	341218(41)	Pharmacy	Pharmaceutics- III Drug Store and Business Management (DSBM)	4	1	-	70	20	10	100	5
4	341219(41)	Pharmacy	Pharmaceutical Chemistry-III (Organic Chemistry-2)	4	1	-	70	20	10	100	5
5	341210(41)	Pharmacy	English Communication - I	4	1	-	70	20	10	100	5
6	341251(41)	Pharmacy	Environmental Science	3	-	-	70	20	10	100	3
7	341226(41)	Pharmacy	Pharmaceutics- II (Hospital & Community Pharmacy) Practical	-	-	3	60	-	40	100	2
8	341227(41)	Pharmacy	Anatomy, Physiology and Health Education- II (APHE-II) Practical	-	-	3	60	-	40	100	2
9	341229(41)	Pharmacy	Pharmaceutical Chemistry- III (Organic Chemistry-2) Practical	-	-	3	60	-	40	100	2
10	341220(41)	Pharmacy	English Communication-I Practical	-	-	3	60	-	40	100	2
TOTAL				23	5	12	660	120	220	1000	36

Min. Pass Marks: (A) Theory ESE & TA+CT (Combined): 50%, (B) Practical ESE & TA (Combined): 50%

L- Lecture, T- Tutorial, P- Practical, ESE- End Semester Exam, TA- Teacher's Assessment

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Subject: Pharmaceutics- II (Hospital and Community Pharmacy)

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341216(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

- 1.1. **Organization and Structure:** Organization of a hospital and hospital pharmacy, responsibilities of a hospital pharmacist, Pharmacy and Therapeutic Committee, budget preparation and implementation.
- 1.2. **Hospital Formulary:** Contents, preparation and revision of hospital formulary.

Module: 2 (8 Hrs.)

2.1. Drug Store Management and Inventory Control:

- 2.1.1. Organization of drug store. Types of materials stocked, storage conditions.
- 2.1.2. Purchase and Inventory Control principles, purchase procedures, Purchase order, Procurement and stocking.

2.2. Drug distribution System in Hospitals:

- 2.2.1. Outpatient dispensing, methods adopted, mandatory labeling of drugs.
- 2.2.2. Dispensing of drugs to in-patients. Type of drug distribution systems. Changing policy,.

Module: 3 (8 Hrs.)

3.1. Central Sterile Supply and their Management: Types of materials for sterilization, packing of materials prior to sterilization, sterilization equipment, Supply of sterile materials.

3.2. Manufacture of Sterile and Non-sterile Products: Policy making of manufacturable items, demand and costing, personnel requirements, manufacturing practice, master formula card, production control, manufacturing records.

Module: 4 (8 Hrs.)

4.1. Surgical Products: Definition, Primary wound dressing, absorbents, surgical cotton, surgical gauzes, bandages, adhesive tape, protective cellulosic hemostatics, dressings, absorbable and non-absorbable sutures, ligatures and catguts.

4.2. Drug Information Services: Sources of information on drugs, disease, treatment schedule, procurement of information, computerized services (e.g. MEDLINE), retrieval of information, medication error.

Module: 5 (8 Hrs.)

5.1. Records and Reports: Prescription filling, drug profile, patient medication profile, cases on drug interaction and adverse reactions, idiosyncratic cases.

5.2. Community Pharmacy: Organization and structure of retail and whole sale drug store-types of drug store and design, legal requirements for establishment, maintenance and drug store-dispensing of proprietary products, maintenance of records of retail and whole sale, patient counseling, role of pharmacist in community health care and education.

Text Books/Reference Books (Latest Edition):

1. H.S Merchant and J. S. Qadry, Text Book of Hospital Pharmacy, B.S. Shah Prakashan, Ahmedabad.
2. P. Nanda & R.K. Khar, Text book of Hospital & Clinical Pharmacy, Birla Publications, New Delhi.
3. P.C. Dandiya & M. Mathur, A text book of Hospital & Clinical Pharmacy, Vallabh Prakashan, New Delhi.
4. A.A. Siddiqui & M. Ali, Hospital & Clinical Pharmacy, CBS Publishers, New Delhi.

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Subject: Anatomy, Physiology and Health Education-II (APHE-II)

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341217(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

1.1. Central Nervous System: Functions of different parts of brain and spinal cord. Neurohumoral transmission in the central nervous system, reflex action, electroencephalogram, specialized functions of the brain, cranial nerves & their functions.

Module: 2 (8 Hrs.)

2.1. Autonomic Nervous System: Physiology & functions of the autonomic nervous system. Mechanism of neurohumoral transmission in the Autonomic Nervous System.

2.2. Urinary System: Various parts, structures and functions of the kidney and urinary tract. Physiology of urine formation, acid-base balance. Functional disorders of the urinary system.

Module: 3 (8 Hrs.)

3.1. Reproductive System: Male and female reproductive systems and their hormones, physiology of menstruation and fertilization. Oogenesis, spermatogenesis and organogenesis. Pregnancy, its maintenance and parturition.

3.2. Endocrine System: Basic anatomy and physiology of Pituitary, Thyroid, Parathyroid, Adrenals, Pancreas Testes and Ovary, their hormones and functions. Diseases in hypo and hyper secretions.

Module: 4 (8 Hrs.)

4.1. Respiratory system: Anatomy of respiratory organs and its functions, respiration mechanism and regulation of respiration, respiratory volumes and vital capacity.

4.2. Sense Organs: Basic anatomy and physiology of the eye (vision), ear (hearing and balance), taste buds, nose (smell) and skin (superficial receptors).

Module: 5 (8 Hrs.)

5.1. Health Education: Brief outline of communicable diseases, Their causative agents, Mode of transmission and Prevention - Chicken pox, Measles, Influenza, Diphtheria, Whooping, cough, Tuberculosis, Poliomyelitis, Hepatitis, Cholera, Typhoid, Food poisoning, Helminthiasis, Malaria, Filariasis, Rabies, Trachoma, Tetanus, Syphilis, Gonorrhoea and AIDS.

Text Books/Reference Books(Latest Edition):

1. Ross & Willson, Anatomy and Physiology in Health & Illness, , Churchill Living Stone.
2. Tortora G.J., & Anagnodokos N.P. Principles of Anatomy & Physiology,
3. Guyton A C, Hall JE., Saunders W.B., Company Text book of Medical Physiology,
4. Chhatterjee C .C. ,Human Physiology, Medical Allied Agency, Calcutta.

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Subject: Pharmaceutics- III

Drug Store and Business Management (DSBM)

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341218(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

1.1. Concept of Management: Principles of Management (Co-ordination, Communication, Motivation, Decision making, leadership, innovation, creativity, delegation of authority/responsibility and record keeping) Identification of Key points to give maximum thrust for development and perfection.

1.2. Types of Management: Administrative management (Planning, Organizing, Staffing, Directing and Controlling), Entrepreneurship development, Operative Management (Personnel, Materials, Production, Financial, Marketing, Time/space, Margin/Morale).

Module: 2 (8 Hrs.)

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

Module: 3 (8 Hrs.)

4.1. Pharmaceutical Marketing: Function, buying, selling, transportation, storage, finance, feedback, information, channels of distribution, wholesale, retail, departmental store, multiple shop and mail order business.

Module: 4 (8 Hrs.)

4.1. Salesmanship: Principles of sales promotion, advertising, ethics of sales, merchandising, literature & detailing. Recruitment, training, evaluation and compensation to the pharmacist.

4.2. Market research: Prerequisites, Basic information services.

Module: 5 (8 Hrs.)

5.1. Materials management: A brief exposure to the basic principles of materials management, purchase, stores and inventory control and evaluation of materials management.

5.2. Production Management: A brief exposure of the different aspects of production management (Visible & Invisible) inputs, methodology of activities, performance evaluation techniques, Process-flow, process management and maintenance management.

Text Books/Reference Books (Latest Edition):

1. R. Saxena, "Marketing Management", Tata McGraw Hill.
2. M.J. Etazel, B. J. Walker and W. J. Stanton, Text Book of Marketing, Tata McGraw Hill.

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Subject: Pharmaceutical Chemistry III (Organic Chemistry-2)

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: B. Pharmacy

Code: 341219(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

Hydrocarbons

Alkanes: Nomenclature, General methods of preparation, physical properties, combustion, Free radical substitution reactions (Chain reaction: halogenation).

Alkenes: Nomenclature, general methods of preparation, Electrophilic addition reactions, Markovnikov rule, Antimarkovnikov rule, Catalytic hydrogenation, Oxidation, Combustion.

Module: 2 (8 Hrs.)

Alkynes: Nomenclature, general methods of preparation, Electronegativity of *s* hybridized carbon and acidity of acetylene, Substitution and Addition reactions.

Alcohols: Nomenclature, General methods of preparation, Physical properties (Hydrogen bonding) Nucleophilic substitution reactions and Elimination reaction of alcohols, Saytzeff rule

Module: 3 (8 Hrs.)

Carbonyls- General methods of preparation, their synthesis, and physical and chemical properties.

Aldehydes and Ketones: General methods of preparation, acidity of α -hydrogen, Nucleophilic addition reactions, Aldol condensation reaction, Cannizzaro reaction, Clemmensen reduction

Module: 4 (8 Hrs.)

Carboxylic acids: Nomenclature, general methods of preparation, physical and chemical properties of Acid halides and anhydrides, Effect of substituent on acidity of Acid halides and anhydrides.

Module: 5 (8 Hrs.)

Catalytic hydrogenation, Dehydrogenation, Electrolytic reaction, Sigmatropic reaction

List of Text Books/Reference Books (Latest Edition):

1. Morrison & Boyd, Organic Chemistry, Pearson Education.
2. Bahl & Bahl, Advanced Organic Chemistry, S.Chand Publisher, New Delhi.
3. I.L. Finar Organic Chemistry Vol. I & II, , Pearson Education.
4. Bentley & Driver, Text of Pharmaceutical Chemistry, Oxford University Press, New Delhi.

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Subject: English Communication

Total Theory Periods: 40

Total Marks in End Semester Examination: 70

Minimum number of class tests to be conducted: 2

Branch: Pharmacy

Code: 341210(41)

Total Tut. Periods: 12

Module: 1 (8 Hrs.)

1.1. Communicative Grammar: Time, tense and aspect; Verbs of states and events; Statements, questions and responses; Omission of information; Expressing emotion and attitude, hope, pleasure, disappointment, regret, approval, surprise.

Module: 2 (8 Hrs.)

2.1 Communication: Verbal and non-verbal spoken and written; Language functions descriptive, expressive and social; to inform, enquire, attract, influence, regulate and entertain; Bias-free and plain English; Formal and informal style.

Module: 3 (8 Hrs.)

3.1. The Sounds of English: Length of vowels-Long vowels as in feel, card, court, food and first respectively; Short vowels as in pen, bag, and sun respectively; Consonants as in fine, vast, thought, them, song, zoo, shame, pleasure and judge respectively; Friendly communication-greeting, farewells, introduction, thanks, apologies, regrets, good wishes congratulations, condolences, offers.

Module: 4 (8 Hrs.)

4.1. Doing things with words: To ask for information, help, permission; to instruct, command, request, accept, refuse, prohibit, persuade, and promise.

Module: 5 (8 Hrs.)

5.1. Writing: Selecting material for expository, descriptive, and argumentative pieces, business letters; formal report; summarizing and abstracting; expressing ideas within a restricted word limit; paragraph division; the introduction and the conclusion; listing reference material; use of charts, graphs and tables; punctuation and spelling; semantics of connectives, modifiers and modals; variety in sentences and paragraphs.

Text Books / Reference Books (Latest Edition):

1. S R Inthira & V Saraswathi " Enrich your English – a) Communication skills b) Academic skills " Publisher CIEFL & OUP
2. R.C. Sharma and K.Mohan, "Business Correspondence and Report Writing " , Tata McGraw Hill , New Delhi , 1994

3. L.Gartside , “Model Business Letters” , Pitman , London , 1992
4. Longman , “Longman Dictionary of Contemporary English” (or „Oxford Advanced Learner s Dictionary of Current English” , OUP , 1998.
5. Maxwell Nurnberg and Rosenblum Morris , “All About Words” , General Book Depot, New Delhi , 1995
6. Greenbaum, Greenbaum Sidney, A Student's Grammar of the English Language, Pearson Education India, 2005
7. Douglas Biber, Susan Conrad, Geoffrey N. Leech, Longman Student Grammar of Spoken and Written English: Workbook, Volume 1-4, Longman, 2002
8. Geoffrey N. Leech, Meaning And The English Verb, Pearson/Longman, 2004
9. Saraswati, English Language Teaching:Principles&Practice, Orient Blackswan, 2004
10. Percival Christopher Wren, H. Martin, High School English Grammar and Composition, S.Chand & Company, 1995
11. Dr. B.B.Jain, Learn To Write Correct English (Eng.-Hindi), Upkar Prakashan, 2010
12. Kumkum Bhardwaj, Professional Communication, I. K. International Pvt Ltd, 2008
13. Jayanthi Dakshina Murthy, Correct Your Common Errors In English, Upkar Prakashan, 2010
14. Raymond Murphy, English Grammar In Use without Answers: A Reference and Practice Book for Intermediate Students of English, Cambridge University Press, 2004

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Branch: B. Pharmacy

Subject: Pharmaceutics- II (Hospital & Community Pharmacy) Lab. **Code:** 341226(41)

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

List of Practical (A minimum of 10 experiments shall be conducted)

1. To study the different types of Sterilizers (Autoclave, Hot air oven, membrane filter).
2. To sterilize surgical instruments and surgical dressings.
3. To sterilize syringes, needles and glassware.
4. To sterilize rubber gloves and rubber tubing.
5. To study the use of Computers in hospital for registration of patient in OPD/IPD case history and pre-operation check list.
6. To study the use of Computer in day information center.
7. To study the use of Computer in prescription filling.
8. To study the use of Computer in documentation of information on day information
9. To study the role of Pharmacist in family planning.
10. To Prepare and submit 100ml (500ml) of 5% w/v Dextrose intravenous infusion I.P.
11. To prepare and submit 100ml(500ml) of 0.9%w/v Sodium chloride intravenous infusion I.P.
12. To prepare and submit 500ml of Compound sodium lactate injection I.P. (Hartmann's solution).
13. To prepare and submit 100ml (500ml) of sodium chloride and dextrose injection I.P
14. To prepare and submit 100ml (500ml) of 1.6% w/v sodium chloride hypertonic injection I.P.
15. To prepare and submit simple powder and compound powder.
16. To prepare and submit powder containing small doses.
17. To prepare and submit powder containing liquids.
18. To prepare and submit powder containing liquefiable substances.
19. To prepare and submit powder containing hygroscopic, efflorescent and deliquescent substances.
20. To prepare and submit effervescent granules.
21. To prepare and submit dusting powder.
22. To prepare and submit simple mixture containing soluble substances only.
23. To prepare and submit mixture containing diffusible solids.
24. To prepare and submit mixture containing small doses of potent medicaments.
25. To prepare and submit prescription possessing Physical Incompatibility (Incomplete Solution).
26. To prepare and submit prescription possessing Chemical Incompatibility (Soluble salicylates with acids-Adjust Incompatibility).
27. To prepare and submit prescription possessing Chemical Incompatibility (soluble salicylates with ferric salts, soluble benzoates with ferric salts).

Text Books/Reference Books (Latest Edition):

1. P. Nanda & R.K. Khar, Text book of Hospital & Clinical Pharmacy, Birla Publications, New Delhi.
2. Dr. A.P. Paradkar, S.B. Gokhale & Mrs. B.A. Bapat, Practical Hospital & Clinical Pharmacy. Mirmal Prakashan, New Delhi

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Branch: B. Pharmacy

Subject: Anatomy Physiology and Health Education-II (APHE-II) Lab. **Code:** 341227(41)

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

List of Practical (A minimum of 10 experiments shall be conducted)

1. To study human digestive system with help of chart and models and study histology of salivary glands, esophagus, stomach, pancreas, liver, small intestine, large intestine.
2. To study human urinary system with help of chart and models study histology of nephron, urinary bladder, ureter
3. To study male and female reproductive system with help of chart and models and study histology of testes, ductus, epididymis, ovary, uterus, mammary glands.
4. To study brain and spinal cord with help of chart and models and study histology of cerebrum, cerebellum, spinal cord
5. To study structure and physiology of special senses.
6. To study structure and physiology of Eye.
7. To study structure and physiology of Ear.
8. To study structure and physiology of Skin.
9. To study structure and physiology of Taste buds.
10. To study structure and physiology of Nose.
11. To perform urine analysis for physiological (normal) constituent present in urine sample.
12. To study pathological (abnormal) constituent in the urine sample.
13. To perform quantitative analysis for presence of glucose in urine sample.
14. To perform vital capacity test.
15. To evaluate reflex action of limbs, eyes.
16. To study clinical features, mode of transmission and prevention of communicable diseases.

Text Books/Reference Books (Latest Edition):

1. S.R. Kale & R.R. Kale, Practical Human Anatomy & Physiology, Nirmal Prakashal, New Delhi.

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Subject: Pharmaceutical Chemistry III (Organic-2) Lab.

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

Branch: B. Pharmacy

Code: 341229(41)

List of Practical (A minimum of 10 experiments shall be conducted)

1. Identification of functional groups of organic compounds.
2. Identification of unknown sample of organic compounds. (eg: Citric acid, Tartaric acid, Oxalic acid, Naphthol, Glucose, Sucrose, Starch)
3. Melting Point determination, boiling point determination, solubility studies, recrystallization, functional group determination(carbonyls)
4. Preparation of respective compounds.
5. Prepare and submit Phthalimide from Phthalic anhydride.
6. Prepare and submit Iodoform from ethanol.
7. Prepare and submit Fluorescein from Phthalic anhydride
8. Prepare and submit Aspirin from Salicylic acid.
9. Prepare and submit Eosin from Fluorescein.
10. Prepare and submit Picric acid from phenol
11. Prepare and submit Benzamide from Benzoyl Chloride.
12. Prepare and submit Benzoic acid from Benzamide.

Text Books/Reference Books (Latest Edition):

1. B.S. Furniss, A.J. Hannaford, P.W.G. Smith & A.R. Tatchell, Vogel's text Book of Practical Organic Chemistry, Pearson Publication, New Delhi.
2. A.A. Siddiqui & Md. Ali, Practical Pharmaceutical Chemistry, C.B.S. Publication, New Delhi.
3. A.A. Siddiqui & Md. Ali, Experimental pharmaceutical Chemistry, C.B.S. Publication, New Delhi.

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Subject: English Communication

Total Practical Periods: 36

Total Marks in End Semester Examination: 60

Branch: B. Pharmacy

Code: 341220(41)

List of Practical (A minimum of 10 tasks shall be performed)

1. Make a list of nonverbal communication
2. How body language is casually conditioned?
3. Take passages of descriptive, expressive and social functions and analyses them.
4. Expressive (exposing feelings) language in English and your mother-tongue
5. Make a list of sexist language (e.g. poetess, chairman)
6. Mentally retarded should be replaced by mentally challenged. Make a list of similar Expressions
7. Say formula expressions (Thank you, sorry, hello, that's right) with proper intonation
8. Make a list of words which should be avoided because they sound pompous. Which words would you use instead of them?
9. How to express pleasure, regret, and approval?
10. Time and tense are not the same. Give some examples.
11. Take similar vowels and consonants and practice them in pairs of words.
12. Practice, stress and intonation in connected speech.
13. Conversation practice in familiar situations (Play the role of a tailor and a customer, for example)
14. Ask for specific information (can you tell me where the railway station is?)
15. Making a request (can I borrow your scooter, please?)
16. Asking for permission (Do you mind if I drive your car?)

Text Books / Reference Books (Latest Edition):

1. Geoffrey Leach and Jan Svartvik, Longman, A Communicative Grammar of English, Pearson Education Pvt. Ltd.
2. J.K. Chand and B.C. Das, A Millennium Guide to Writing & Speaking English, Friends Publishers.
3. J.D.O Connor, Better English Pronunciation, ELBS.
4. John Sealy, Oxford Guide to Writing and Speaking, OUP.
5. Mark McCormack : "Communication"
6. John Metchell " How to write reports"
7. Greenbaum, Greenbaum Sidney, A Student's Grammar of the English Language, Pearson Education India, 2005
8. Douglas Biber, Susan Conrad, Geoffrey N. Leech, Longman Student Grammar of Spoken and Written English: Workbook, Volume 1-4, Longman, 2002
9. Geoffrey N. Leech, Meaning And The English Verb, Pearson/Longman, 2004
10. Saraswati, English Language Teaching:Principles&Practice, Orient Blackswan, 2004
11. Percival Christopher Wren, H. Martin, High School English Grammar and Composition, S.Chand & Company, 1995

12. Dr. B.B.Jain, Learn To Write Correct English (Eng.-Hindi), Upkar Prakashan, 2010
13. Kumkum Bhardwaj, Professional Communication, I. K. International Pvt Ltd, 2008
14. Jayanthi Dakshina Murthy, Correct Your Common Errors In English, Upkar Prakashan, 2010
15. Raymond Murphy, English Grammar In Use without Answers: A Reference and Practice Book for Intermediate Students of English, Cambridge University Press, 2004

Chhattisgarh Swami Vivekanand Technical University

Semester: 2nd

Subject: Environmental Science

Total Theory Periods: 30

Total Marks in End Semester Examination: 70

Branch: B. Pharmacy

Code: 341251(41)

Proposed Syllabus of Environmental Science for CSVTU, Bhilai

Module 1 (6 Hrs): General Ecology and concepts of Environmental Sciences

- 1.1 General: Definition, Scopes and basic principles of ecology and environment. Biological levels of organization, population, community, ecosystem and biosphere.
- 1.2 Geographical conditions of Chhattisgarh including biodiversity, species and approaches to their conservation.

Module 2 (6 Hrs): Ecosystem and Biodiversity:

- 2.1 Ecosystem: Basic concepts and components, Trophic levels, food chains and food webs. Ecological pyramids, ecosystem functions. Energy flow in ecological systems.
- 2.2 Biodiversity: Basic concepts, importance, and conservation. Species diversity, Biological and phylogenetic species concept. Factors for decline of biological diversity. Approaches for conservation of biological diversity.

Module 3 (6 Hrs): Environmental Impact of Pharmaceuticals.

- 3.1 Environmental persistent pharmaceutical pollutants (EPPP): Water pollution, Ground water pollution and soil contamination, Laws and regulations related to pharmaceutical pollution control.
- 3.2 Effects of pharmaceuticals in the environment, Pharmaceutical pollution: source, effect and prevention

Module 4 (6 Hrs): Natural resource of Chhattisgarh and its conservation

- 4.1 Types of Natural Resource, Air Resource, Soil resource: Soil formation, soil types, soil profiles and soil characters
- 4.2 Metal and Mineral resource, Forest resource, Energy resource, Water Resource, Water harvesting

Module 5 (6 Hrs): Drug Disposition and Human Right & Duties

- 5.1 Safe methods of disposals of pharmaceuticals, Standard methods for treatment of expired medicine, Environment friendly treatment of medical waste, Study of various chemical and drug tragedy like Sulphonamide Elixir Tragedy 1937, Bhopal gas tragedy 1984.
- 5.2 Human Right, Environment, Fundamental Duty and Women & Child welfare.

Related books

1. Chhattisgarh Samagh, Chhattisgarh Granth Hindi Academy Raipur
2. Singh K.P. and J.S. Singh. Tropical Ecosystems: Ecology and Management. Wiley Eastern Limited, Lucknow, India.
3. Botkin, D.B. and Keller, E.A. Environment Science: Earth as a living planet. John Wiley and Sons Inc.
4. Chandel, K.P.S., Shukla, G. And Sharma, N. Biodiversity in Medicinal and Aromatic Plants in India Conservation and Utilization, National Bureau of Plant Genetic Resources, New Delhi.
5. Soule, M.E. Conservation Biology. The Science of Scarcity and Diversity. Sinaur Associates, Inc., Sunderland, Massachusetts.
6. Singh, J.S., Singh, S.P. and Gupta, S.R. Ecology, Environment and Resource Conservation, Anamaya Publishers, New Delhi.
7. Miller T.G. Environmental Science Wads worth Publishing Co.