

### First Year: First Semester

S. No	Course Code	Subject	Credit Hour		Hrs/ Wk	Hrs/ Sem.	Evaluation			
			Theory	Pr.			Internal		Final	
							FM	PM	FM	PM
1.	PHAR 111	Pharmaceutical Inorganic Chemistry	3	-	3	48	20	10	80	40
2.	PHAR 112	Pharmacognosy- I	3	-	3	48	20	10	80	40
3.	PHAR 113	Physical Chemistry	3	-	3	48	20	10	80	40
4.	PHAR 114	Mathematics	3	-	3	48	20	10	80	40
5.	PHAR 115	Basic Computer Applications	2	-	2	32	20	10	80	40
6.	PHAR 116	Communication Skill	2	-	2	32	20	10	80	40
7.	PHAR 111 Lab	Pharmaceutical Inorganic Chemistry Practical	-	1	3	48	30	18	20	12
8.	PHAR 112 Lab	Pharmacognosy- I Practical	-	1	3	48	30	18	20	12
9.	PHAR 113 Lab	Physical Chemistry Practical	-	1	3	48	30	18	20	12
10.	PHAR 115 Lab	Basic Computer Applications Practical	-	1	3	48	30	18	20	12
<b>Total Credit</b>			<b>16</b>	<b>4</b>	<b>28</b>	<b>448</b>	<b>240</b>		<b>560</b>	
<b>Total Credit Hours (Theory and Practical) and Full Marks</b>			<b>20</b>				<b>800</b>			

## **FIRST SEMESTER**

### **PHAR 111 Inorganic Pharmaceutical Chemistry [48 Hours]**

**Unit 1:** Sources of impurities in pharmaceuticals, Test of Purity, Importance of limit test and general principles of limit tests for chloride, sulphate, Heavy metals (lead, arsenic) and iron.

**(3hrs)**

#### **Unit 2: Acid, Base, Buffers and Water**

**(10 hrs)**

Introduction, Different concepts of acid and base, Importance of acids and bases in Pharmacy, storage condition. Official acids: Phosphoric acid (Conc/dil), HCl (Conc/dil), Boric acid. Official Bases: NaOH, KOH, Ca(OH)<sub>2</sub>, dil. and strong NH<sub>3</sub>, Na<sub>2</sub>CO<sub>3</sub>, Acidosis and Alkalosis.

**(3 hrs)**

**Buffer:** Definition, types of buffer, properties, pH of buffer and calculation of pH (Handerson Hasselbalch equation), Mechanism of buffer action, buffer capacity, criteria for buffer selection, Role of buffers in pharmacy, some examples of buffer system, physiological acid-base balance, buffer system in body and their role

**(3 hrs)**

**Official buffer:** Standard buffer system, pharmaceutical buffer system, composition of standard buffer: (Hydrochloric acid buffer, acid phthalate buffer, neutralized phthalate buffer, phosphate buffer, alkaline buffer)

**(1 hr)**

**Water:** Importance, types of water (Potable water, Purified water, Water for Injection/ Sterile), Water Purification Method (Distillation, Ion Exchange Method & Reverse Osmosis Method), Monographic study of purified water, water for injection according to latest pharmacopoeia.

**(3 hrs)**

#### **Unit 3: Gastrointestinal Agents**

**(6 hours)**

**Antacids:** Definition, criteria for selection, classification, non-systemic (Aluminum hydroxide, calcium carbonate, magnesium oxide, magnesium carbonate and magnesium trisilicate), systemic (sodium bicarbonate); combination preparations (types & significances)

**(3 hrs)**

Protective & adsorbent: Definition, characteristics, Bismuth sub carbonate, Kaolin **(1 hr)**

Acidifying agents or Acidifiers: Definition, types of acidifiers, dilute hydrochloric acid **(1 hr)**

**Cathartics (Purgatives):** Definition, classification of purgatives, mechanism of action of each purgatives, magnesium sulphate, sodium potassium tatarate, sodium phosphate **(2 hrs)**

#### **Unit 4: Intracellular, Extracellular Electrolytes and Cations & Anions**

**(4 hours)**

##### **Intracellular, Extracellular Electrolytes:**

Role of physiological ions (sodium, potassium, magnesium, sulphate, bicarbonate, phosphate) & acid base balance, electrolytes used in acid-base therapy (potassium citrate, sodium acetate and Ammonium Chloride), Electrolyte used in replacement therapy (NaCl, KCl, composition of ORS, Ringer lactate solution)

**(3 hrs)**

##### **Cations & Anions:**

**(1 hr)**

Definition, Biological roles or importance of cations (Sodium, Potassium, Calcium) & anions (Chloride, Bicarbonate, Phosphate)

**Unit 5: Essential Trace Elements: (4 hours)**

Definition of transition elements; Iron & haemantenics; Functions of iron in the body, Causes of deficiency of iron. Focus on Compounds: Ferrous Fumarate; Ferrous Gluconate and Ferrous sulphate) Mineral Supplements (Cu, Zn, Cr, Mn, Sb, S, I).- Introduction, Role and deficiency.

**Unit 6: Topical Agents: (4 hrs)**

**Protective;** - Definition, Classification, Focus on talcum, Zinc oxide, Calamine

**Local anti-infective:** Definition, Classification, Focus on H<sub>2</sub>O<sub>2</sub>, KMnO<sub>4</sub>, Iodine, Povidone iodine; Advantage of Povidone iodine over iodine.

**Astringents:** Definition, Mechanism of action, Focus on Alum, ZnSO<sub>4</sub>, AgNO<sub>3</sub>,

**Unit 7: Gases & Vapors: (3 hrs)**

Definition, role of gases in our body, focus on Oxygen, CO<sub>2</sub>

**Inorganic anesthetics:** Definition, Nitrous oxide

**Respiratory Stimulant:** Definition, Ammonia solution, spirit of ammonia

**Unit 8: Dental Product (3 hrs)**

Introduction and types of dental products with examples; Dentifrices: Calcium Carbonate and Dicalcium phosphate. Dental caries/dental plaque, Anti-caries agent: Role of fluoride as anticaries agent, consequences of fluoride overdosing, Sodium Fluoride and Stannous fluoride.

**Unit 9: Complexing & Chelating Agents used in Therapy: (3hrs)**

Concept of complexation & chelation, properties of chelating agent, importance of chelation; Heavy metal poisoning and their antagonist (Activated Charcoal, Disodium edetate, desferroaxamine mesylate, D-penicillamine, dimercaprol).

**Unit 10: Miscellaneous Agents: (5 hrs)**

i. Antidotes in Poising:(Introduction, heavy metals, and their antagonist, Cyanide poisoning) **(1 hr)**

ii. Antioxidant and preservatives: Introduction, criteria, mechanism of action, detail study of new official compounds; **(1 hr)**

iii. Pharmaceutical aids: Filter aids, adsorbents, dilutes, excipients, suspending agents, colorants **(1 hr)**

iv. Miscellaneous agents: Sclerosing agents, expectorants emetics and sedatives **2hrs**

**Unit 11: Inorganic Radio Pharmaceuticals: (3 hrs)**

Definition, Isotopes, Radioactive decay particles, Units of radio activity & half life of radio elements, Precaution to be taken while handling & storage of radio isotopes, Application, Radio pharmaceutical preparation & clinical uses of Cobalt- 57 & 60, Gold-198, Iodine-125 & 131, Radio opaque contrast media ( $\text{BaSO}_4$ ); types, ideal properties of radio opaque contrast media.

### **PHAR 111 Lab:Inorganic Pharmaceutical Chemistry I Practical (48 hours)**

- Identification tests for pharmacopoeal inorganic pharmaceuticals and qualitative tests for cations & anions should be covered. At least four inorganic drugs should be prepared in the laboratory.
- Limit test for Chloride, sulphate and iron should be done according to current pharmacopoeia.
- Monographic study of Purified water according to latest pharmacopoeia.

### **Books and other resources recommended (Latest edition)**

1. Practical pharmaceutical chemistry by A.H. Beckett and J.B. Stenlake
2. British pharmacopoeia, Indian pharmacopoeia
3. Text book of pharmaceutical chemistry by Bentley and Driver
4. Inorganic pharmaceutical chemistry by G.R. Chatwal
5. Inorganic pharmaceutical and medicinal chemistry by Block, Roche, Soine and Wilson.

## **PHAR 112: Pharmacognosy- I**

**[48 Hours]**

### **Unit – 1: Introduction**

**(8 hours)**

Definition, Historical back ground, present status and future scope of Pharmacognosy. Vegetation occurring in various climatic zones of Nepal, method of plant collection, preparation of herbarium and their storage including traditional and complementary system of medicine.(Ayurvedic, homeopathic, traditional Chinese, siddha system, Unani system and Amachi system).

### **Unit – 2: Cultivation, Collection, Processing and Storage of Crude Drugs (10 hours)**

Methods of propagation, Factors influencing the cultivation of medicinal plants.Types of soil and fertilizers of common use. Pest management and natural pest control agents. Polyhouses and greenhouses.Plant hormones and their application, polyploidy and hybridization with the special references to medicinal plants.

### **Unit – 3: Plant Description**

**(8 hours)**

Key characters, family description of one member each from the following: Rutaceae, Umbelliferae, Labiatae, Solanaceae, Liliaceae, Myrtaceae and Rubiaceae.

### **Unit – 4: Study of Herbal Resources**

**(14 hours)**

Classification of crude drugs (Alphabetical, morphological, taxonomical, chemical, pharmacological and chemotaxonomical with principle, merits and demerits and examples). Study of different plant tissue system. Organized crude drugs- General morphological and anatomical study of subterranean organs, leaf, bark, wood, fruits and seeds. Unorganized crude drugs- general identifying characters.

Macroscopical and microscopical characters, varieties, cultivation, collection, principal, constituents, chemical nature, tests for identification, adulterants, substitutes and uses of the following drugs. Leaves: Eucalyptus. Flowers: Saffron. Fruit: Fennel. Powder: Lycopodium. Barks: Cinchona. Seeds: Ispaghula. Woods: Sandal

### **Unit – 5: Commercial Production and Quality Control of Crude Drugs (8 hours)**

Commercial production of crude drugs, Adulteration of crude drugs and their detection by organoleptic, microscopic, physical, chemical and biological methods of evaluation. WHO guide lines of the standardization of Herbal raw materials and finished products.

## **PHAR 112 Lab: Pharmacognosy- I Practical**

**(48 hours)**

### **Proposed Practical Topics**

1. Morphological characteristics of plant families in theory.
2. Microscopic measurements of cells contents: starch grains, calcium oxalate crystals and phloem fibers.

3. Determination of leaf constants such as stomatal index, stomatal number, vein islet number, vein termination number and palisade ratio.
4. Preparation of Herbarium sheet.
5. Identification of crude drugs mentioned in theory.

**Experiments list out:**

1. Study of covering and glandular trichomes.
2. Study of stomata (diacytic, paracytic, anisocytic, anisocytic stomata).
3. To determine leaf constants of given leaf using Camera Lucida (Stomatal number, Stomatal index, Palisade ratio, Vein islet number, Veinlet termination number).
4. To measure dimension of cell inclusions such as starch grains, calcium oxalate crystals using micrometry.
5. Study of chemomicroscopy using various staining reagents.
6. Study of powder microscopy of given crude drugs.
7. Demonstrate skill of preparation & labeling of herbarium specimen & explain its significance
8. Visit to medicinal plant garden, herbarium and plant tissue culture lab.

**Books and other resources recommended (Latest Editions)**

1. Atal, CK and Kappor, BM. Cultivation and Utilization of Medicinal Plants.
2. Trease, CE and Evans, WC. Textbook of Pharmacognosy. 11th to 14th Editions. Tindal L. U.K.
3. Tyler, VC Brady, LR and Robers JE. Pharmacognosy. 8th Edition, Lea & Febeger, Philadelphia.
4. Wallis, T E. Textbook of Pharmacognosy, 5th Edition, J & A, Churchill Limited, U.K.
5. Kokate, CK Purohit, AP. And Gokhale, SB. Pharmacognosy.
6. Introduction to Alkaloids, A Biogenic Approach, Willy, New York.
7. Vinod D. Rangari, Pharmacognosy and Phytochemistry, Career publication, Nashik.
8. Kaufmann, Natural Products from Plants, CRS Press, New York.
9. Nakanishi K., Chemistry of Natural Products, Kodausha Book Publishing Company, Osaka (Japan).
10. Harborne, J.B., Phytochemical Methods, Chapman & Hall, London.
11. Sim, S.K., Medicinal Plant Guidelines, University of Toronto Press.
12. Sim, S.K., Medicinal Plant Alkaloids, University of Toronto press.
13. Cordell, G.A., The Alkaloids - Chemistry and Pharmacognosy, Academic Press, London.
14. Raphael, Ikan, Natural products, A Laboratory Guide, Academic Press, INC.
15. Agarwal, O.P., Chemistry of Organic Natural Products, Krishna Prakashan Media (P) Ltd., Meerut, India.
16. Kalia, A.N., Textbook of Industrial Pharmacognosy.
17. Jarald, E.E., Jarald, S.E., Textbook of Pharmacognosy and Phytochemistry.
18. Bruneton Jean, Pharmacognosy and Phytochemistry of Medicinal Plants.

19. Kaufmann, Natural Products from Plants, CRC Press, New York.

## **PHAR 113 Physical Chemistry**

**[48 Hours]**

### **Unit – 1: Gaseous State**

**(4 hrs)**

Introduction, gas laws, kinetic theory of gaseous, derivation of kinetic gas equation, deduction of gas laws, deviation from ideal behaviors, Vander Waal equation of state for real gases, significances of Vander Waal constant a and b, critical phenomena and vander Waal constant value of a and b.

### **Unit – 2: Liquid State**

**(6 hrs)**

Introduction, vapor pressure and boiling point, surface tension, determination of surface tension by drop formation method, viscosity and its determination by ostwald's viscometer, effect of temperature on viscosity, additive and constitutive properties, parachor and reochor, refractive index, optical rotation, dipole moments.

### **Unit – 3: Solutions**

**(10 hrs)**

Mole concept, concentration terms, ideal and real solutions, Henry's law, colligative properties, ideal solution(non volatile solute), lowering of vapor pressure, Raoult's law, determination of molecular weight from vapor pressure lowering, ideal solution and deviation from Raoult's law, ideal solution of two volatile components, elevation of boiling point, determination of molecular weight from freezing point depression, osmotic pressure, distribution coefficient, application and limitations of distribution law, phase rule, statements, terms involved in phase rule, derivation of phase rule, single component system( water system). Conductance (specific conductance, equivalent conductance, molar conductance, cell constant), measurement of conductance, variation of conductance with dilution, Faraday's law of electrolysis, Debye - Huckel Theory.

### **Unit – 4: Adsorption**

**(3 hrs)**

Adsorption and absorption, Freundlich adsorption isotherm, Langmuir adsorption isotherms, application of adsorption.

### **Unit – 5: Thermodynamics**

**(9 hrs)**

Introduction, importance, limitation, terms/ terminology, state function , extensive and intensive properties, thermodynamic process and system, internal energy, work done(reversible and irreversible). First law of thermodynamics, enthalpy, enthalpy change, temperature dependence

of enthalpy change, Hess's law of constant heat summation, application and calculations; heat of vaporization, heat of fusion, heat of formation, heat of combustion, heat of neutralization, heat capacities and relation between  $C_p$  and  $C_v$ ; criteria of spontaneous process, entropy, second law of thermodynamics, free energy, relation between free energy and equilibrium constant, relation between free energy and useful work. Third law of thermodynamics.

**Unit – 6: Photochemistry (3 hrs)**

Consequences of light absorption, Lambert-Beer's law, Laws of photochemistry, Quantum efficiency.

**Unit – 7: Chemical Kinetics (9 hrs)**

Introduction, rate of reaction, factor influences the rate of reaction, rate law equation, rate constant, order and molecularity of reaction, integrated rate equation for zero order, first order and second order (single and different types of reaction) and half life period, activation energy, temperature dependence of Arrhenius equation, opposing reaction (first order opposed by first order), parallel reaction, collision theory of bimolecular reaction (no derivation), unimolecular reaction, steady state approximation, catalysis, characteristics of catalysis, homogeneous catalysis, heterogeneous catalysis, acid base catalysis, enzyme catalysis, Michaelis Menten equation.

**Unit – 8: Quantum Mechanics (4 hrs)**

Postulates of Quantum Mechanics, Operator (Linear, Laplacian, Hamiltonian operator), and Schrodinger's wave equation.

**PHAR 113 Lab: Physical Chemistry Practical (48 hours)**

1. To determine molar mass by Rast method and cryoscopic method.
2. To determine refractive index of given liquids and find out the contribution of carbon, hydrogen and oxygen in molar refraction of a compound.
3. To determine molar mass of volatile liquids by Victor-Meyer method.
4. To determine the specific rotation of sucrose at various concentrations and determine the intrinsic rotation.
5. To determine the heat of solution, heat of hydration and heat of neutralization.
6. To determine the cell constant, verify Ostwald dilution law and perform conductometric titration,
7. To determine rate constant of simple reaction.

**Books and other resources recommended (Latest edition)**

1. Essential of physical chemistry-B.S. Bahl
2. Meyer's University Chemistry
3. Physical pharmacy and pharmaceutical sciences by Alferd Martin

## **PHAR 114 Mathematics**

**[48 hours]**

### **Unit-1: Differentiation**

**(12hrs)**

Limits of functions, indeterminate forms, theorem on limits of algebraic, trigonometric, exponential & logarithmic functions; continuity of a function; graphs of discontinuity function; definition of differential coefficient, differentiation of standard functions, including function of a function (Chain rule). Differentiation of implicit functions, logarithmic differentiation, parametric differentiation, successive differentiation.

### **Unit-2: Integrals and Applications of the integrals**

**(12hrs)**

Integration as inverse of differentiation, indefinite integrals of standard forms, integration by parts, substitution and partial fractions, formal evaluation of definite integrals. The definite integral as an area under the given curve, Area between two curves. (Beta & Gamma function only definition)

### **Unit-3: Calculus**

**(6hrs)**

Notation of limit and continuity of a function, derivatives of composite, implicit, parametric, inverse circular, hyperbolic functions, logarithmic differentiation, derivative of a function with reference to another function, application of differentiation, partial differentiation, computation of the first and second order partial derivatives.

### **Unit-4: Differential equations**

**(12 hrs)**

Revision of integral calculus, definition and formation of differential equations, equations of first order and first degree, variable separable, homogeneous and linear differential equations and equations reducible to such types, linear differential equations of order greater than one with constant coefficients, applications of differential equations, complementary function and particular integral, simultaneous linear differential equations, pharmaceutical applications.

### **Unit-5: Laplace transforms**

**(6 hrs)**

Definition, transforms of elementary functions, properties of linearity and shifting, inverse Laplace transforms, transforms of derivatives, solution of ordinary and simultaneous differential equations.

### **Books Recommended (Latest edition)**

1. A Textbook of Mathematics for XI-XII Students, NCERT Publications, Vol. I-IV
2. Grewal B S, Higher Engineering Mathematics, Khanna Publishers, New Delhi.
3. Schaum, Differential Equations, McGraw-Hill Singapore
4. Prasad Gorakh Text book on differential calculus, Pothishala Pvt. Ltd., Allahabad.
5. Narayan Shanti, Differential calculus, Shyam Lal Charitable Trust, New Delhi.
6. Prasad Gorakh Text book on integral calculus, Pothishala Pvt. Ltd., Allahabad.
7. Das B.C. & Mukharjee B.N.: Integral Calculus UN. Dhur & Sons Pvt. Ltd. India.

8. Pant G.D. & Shrestha G.S, Integral Calculus and Differential Equation, SunilaPrakasan, Bhotahity, Kathmandu, Nepal.

## **PHAR 115 - Basic Computer Applications**

**[32 Hours]**

### **Unit- 1: Basic Concept**

**(10 hours)**

History of computers, simple model of computer and working parts of the computer, CPU, memory, input/output devices, computer languages and their hierarchal machine language, assembly language, high level language, comparison of high level and low level languages especially C, C++, PASCAL

### **Unit-2: Operating Systems and Commuter networks-Topology**

**(4 hrs)**

Introduction to types of operating systems, UNIX, MS-DOS, etc. RAM, ROM, Virtual Memory. Introduction to Computer Networks, Email and Internet.

### **Unit-3: Database Management**

**(7 hrs)**

Spread sheets (like MS-EXCEL, ACCESS), concepts and objectives of database, nd database management system, Types of DBMS, advantages and disadvantages of the database management system and examples of DBMS packages (like DBASE III), HINARI, Software development life-cycle

### **Unit- 4: Flow Chart and Algorithm Development**

**(5 hours)**

Definition and properties of the algorithm, Flow chart symbols and their uses, Examples of efficient algorithm and flow-chart, conversion of algorithm/flow-chart to high-level languages.

### **Unit-5: Software**

**(4 hours)**

Introduction, SPSS, EPI Info, Chem Win, Chem 4D and Chem Draw

### **Unit-6: Computer Security System**

**(2 hours)**

Antivirus and others

## **PHAR 115 Lab: Basic Computer Applications Practical**

**(32 hours)**

**Day 1-** Define Folder, Files, Icons, My computer, Introduction to Desktop, Creating, Renaming, moving, Deleting folders, Saving Text, Image, Bitmap to the folder and Changing Wallpaper (Task: Create your own name folder in D:\student\ and make your own name written picture and set as desktop background).

**Day 2-** What is Name of Computer? Network File Sharing, Hard-disk Error Checking, Virus Scanning, Using internet for file attachment and Lock the Taskbar, Screensaver, Hide Desktop, Customize Desktop (Task: Create a text file which contains information about your computer's RAM, Processor and share with your friend in network).

**Day 3-** PowerPoint Introduction, Creating 1st PowerPoint, Animation, Transition, Background, Layout, bullet & numbering and Inserting media, Show (Task: Create a presentation of your own favorite topic and at least 5 slides).

**Day 4-** Creating table and chart in PowerPoint, setting animation timing, inserting shapes to slide and editing picture shape (Task: Prepare a table and design a chart as per data provided).

**Day 5-** Starting MS-Word, Introduction, creating new file, save, open, edit, copy, paste, find and replace, page setup-margin, inserting header and footer, Inserting page break and page number and alignment (Task: prepare application letter for applying to a given post).

**Day 6-** Indent Text, Setting tabs, margin using ruler, formatting text- B,I, U, bullet and numbered lists, font size and character spacing (Task: Prepare your own CV).

**Day 7-** Insert symbols, Header and Footer, Delete header and Footer, Formatting using show/hide button, text boxes- border / color and columns break (Task: prepare newspaper with image inserted)

**Day 8 -** Working with tables, Entering text in the table, creating chart, change text direction in table and inserting and deleting table, rows, resizing table and adding borders and shading (Task: make a table of SLC mark sheet and make a chart of data).

**Day 9 -** Working with shapes, word art drawing objects, drawing toolbar and working with picture and its alignment (Task: Design traffic signals and cover page of report. For advance: section break and page numbering)

**Day 10 -** Working with Excel, creating sheets, renaming sheets, understanding rows and column, inserting rows and column and simple formula (Task: Prepare personal information as well as monthly budget)

**Day 11-15** Working with multiple worksheets, inserting and deleting worksheets, complex formula, merging cells, text and cell alignment, use of function, page setup and chart (Computer lab: Day Working with some common DOS Command) Demonstration and identification of hardware

### **Books and other resources recommended (Latest edition)**

1. Basic computer programming- V.K Jain, pusthak mahal, Delhi
2. Programming in basic by E.Balagurusami, tata mcgrawhill
3. Programming in basic-Gottfried, tata mcgrawhill
4. ABC of windows 98-BPB Publications , New Delhi
5. Working in microsoft office-Ronmansfield
6. Commercial application development using ORACLE developer 2000 by Iran bay ross, BPB Publications, New Delhi
7. Computer fundamentals with pharmacy applications by N.K.Tiwari published by pharma book syndicate.

## **PHAR 116- Communication Skills**

**[32 Hours]**

### **Unit- 1: Communication**

**[4hours]**

Definition of communication; Importance of communication

Major forms of communication

    Internal operational communication

    External operational communication

    Personal communication

Dimension of communication

    Downward communication

    Upward communication

    Horizontal communication

Types of communication

    Verbal communication

        Oral communication

        Written communication

    Nonverbal communication

        Body language

        Sign language

        Para language

        Haptics/Touch language

        Time language

Barriers to effective communication

Tips to improve communication

Time management skills (Communication)

Communication by email

Reading/ Speaking / Listening skills

### **Unit-2: Note Taking Practice from Authentic Textual Materials including the use of Audio Visuals**

**(2 hours)**

Aims of note taking; Taking notes from texts, Taking notes from lectures (Branching notes, Listing and numbering)

*Practical work: taking notes*

### **Unit-3: Writing Article and Summaries**

**(4 hours)**

Definition of articles; Format of writing articles; Definition of summary

The five “**R**” techniques of writing summary (Read, Reduce, Record, Review and Rewrite)

*Practical work: writing articles and summaries*

**Unit 4: Minutes****(5 hours)**

Definition of minute; Parts of a minute (Beginning or introduction, Attendance  
Special attendance, Agenda, Decisions, Closing signature)

*Practical work: preparing minutes*

**Unit -5: Writing Proposals****(3 hours)**

Definition of proposal

Parts of a proposal; Difference between proposal and report

*Practical work: preparing proposals.*

**Unit -6: Report writing****( 5 hours)**

Definition of research report; Qualities of a good report

Parts of a research report

Preliminary

Title page

Letter of authorization

Acknowledgement

Abstract

List of contents

List of tables

List of figures

List of abbreviations

Body part

Introduction

Objectives

Significance

Limitations

Methodology

Source of data

Data collection tools

Data analysis

Findings

Conclusions

Recommendations

End part

References/Bibliography

Appendix

*Practical work: preparing reports*

**Unit- 7: Seminar****( 4 hours)**

Definition of seminar  
Types of discussion groups  
Conducting seminars  
*Practical work: conducting a seminar*

**Unit-8: Business correspondence**

**(5 hours)**

Definition of letter  
Parts of business letters  
Formats of business letters  
    Full block format  
    Modified format  
    Semi blocks or indented form  
Types of business letters  
    Enquiry letters  
    Quotation letters  
    Order letters  
    Complaint letters  
    Replies to complaints  
        Acceptance for adjustments  
        Refusal for adjustments  
Job application and resume  
Memorandum  
    Definition of memorandum  
    Parts of a memo  
        Subject line  
        Introduction  
        Discussion  
        Conclusion

**Practical work: writing business letters, job application letters, memos and preparing resume.**

**Books and Other Resources Recommended (Latest edition)**

1. Business communication skill, Asha Kaul
2. Technical Writing, Gearson and Gearson