# OSMANIA UNIVERSITY
# FACULTY OF PHARMACY
## SCHEME OF INSTRUCTION, EXAMINATION AND EVALUATION

Effective for Batches Admitted from 2016 – 17 Academic Year Onwards As per CBCS

**Program Code: 881** **B. Pharmacy First Year ( I & II Semesters)**

## SEMESTER - I

| Course Code | Description | Course Title | Hours/ Week | | | Credits | Credits | | Duration of exam |
|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | - | End exam | |
| PY.05.881.1.1.T | PS, CORE | Pharmaceutical Inorganic Chemistry | 4 | 0 | - | 4 | 30 | 70 | 3 |
| PY.05.881.1.2.T | BS, FC | Basic Computer Applications-I | 3 | 0 | - | 3 | 30 | 70 | 3 |
| PY.05.881.1.3.T | PS, CORE | General Pharmacy | 4 | 0 | - | 4 | 30 | 70 | 3 |
| PY.05.881.1.4.T | BS, FC | Human Anatomy and Physiology-I | 3 | 0 | 0 | 3 | 30 | 70 | 3 |
| PY.05.881.1.5.T | BS, FC | Mathematics / Biology | 4 | 0 | 0 | 4 | 30 | 70 | 3 |
| PY.05.881.1.6.P | PS, CORE | Pharmaceutical Inorganic Chemistry-Practical | 0 | 0 | 4 | 2 | 30 | 70 | 4 |
| PY.05.881.1.7.P | BS, FC | Basic Computer Applications-I-Practical | 0 | 0 | 4 | 2 | 30 | 70 | 4 |
| PY.05.881.1.8.P. | BS, FC | Human Anatomy and Physiology-Practical | 0 | 0 | 4 | 2 | 30 | 70 | 4 |
| | | | 18 | 0 | 12 | 24 | 240 | 560 | |

## SEMESTER - II

| Course Code | Description | Course Title | Hours/ Week | | | Credits | Credits | | Duration of exam |
|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | - | End exam | |
| PY.05.881.2.1.T | PS, CORE | Pharmaceutical organic Chemistry-I | 4 | 0 | - | 4 | 30 | 70 | 3 |
| PY.05.881.2.2.T | PS, CORE | Introduction to Dosage Forms | 4 | 0 | - | 4 | 30 | 70 | 3 |
| PY.05.881.2.3.T | PS, CORE | Human Anatomy and Physiology-II | 4 | 0 | - | 4 | 30 | 70 | 3 |
| PY.05.881.2.4.T | BS, FC | Basic computer Applications-II | 3 | 0 | 0 | 3 | 30 | 70 | 3 |
| PY.05.881.2.5.T | BS, FC | Communicative English | 3 | 0 | 0 | 3 | 30 | 70 | 3 |
| PY.05.881.2.6.P | PS, CORE | Pharmaceutical Organic chemistry-I-Practical | 0 | 0 | 4 | 2 | 30 | 70 | 4 |
| PY.05.881.2.7.P | BS, FC | Introduction to Dosage Forms-Practical | 0 | 0 | 4 | 2 | 30 | 70 | 4 |
| PY.05.881.2.8.P. | BS, FC | Basic Computer Applications-II and English Language Practical | 0 | 0 | 4 | 2 | 30 | 70 | 4 |
| | | | 18 | 0 | 12 | 24 | 240 | 560 | |

**Note: Marks are converted into Grade Points and Total is calculated for SGPA on a 10 Point Scale**

# PHARMACEUTICAL INORGANIC CHEMISTRY

| **Scheme of Instruction** | | **Scheme of Examination** | |
|---|---|---|---|
| Total Duration | : 50 hrs | Maximum Marks | : 100 |
| Periods / Week | : 4 | Internal Exam | : 30 |
| Credits | : 4 | End Semester | : 70 |
| Instruction Mode | : Lecture | Exam Duration | : 3 Hrs |
| Subject Code | **:** PY.05.881.1.1.T | | |

## Course Objectives

- To impart knowledge on various categories of inorganic medicinal compounds.
- To provide knowledge on significance of various inorganic impurities and methods to test such impurities.
- To make the students aware of Indian Pharmacopoeia and other pharmacopoeias with reference to various inorganic compounds official in those pharmacopoeias.

## Course Outcomes

- The students will get the knowledge about various pharmaceutical inorganic compounds with reference to their Pharmaceutical category, method of their quality tests, Assay and uses
- The student gets the knowledge about various inorganic impurities which may enter the pharmaceutical inorganic compounds and their potential hazards.
- The student will become aware of the various pharmacopoeias and how to refer those books.

**Unit – I**

a) Classification of Inorganic Pharmaceuticals based on their applications, therapeutic classes and uses with examples.
b) Sources of impurities.
c) Limit test for Arsenic, heavy metals, lead, iron, chloride and sulphate.(as per the modified procedure of Indian Pharmacopeia 2014)

Note: Following units all the compounds are of official in Indian Pharmacopoeia.

**Unit – II**

**Definition, Preparation, Properties, tests for purity & Assay of selected compounds(*) and Uses.**

**a) Gastro – intestinal agents:**

(i) Antacids: Aluminum hydroxide gel*, Dried Aluminum hydroxide gel, Magnesium oxide, Magnesium-hydroxide mixture*.
(ii) Laxatives: Magnesium Sulphate.

**b) Electrolytes:** Sodium, Potassium and Calcium replenishers.

(i) Sodium and Potassium replenishers: Sodium chloride* (Ringer solution), Sodium chloride and dextrose injection, Potassium chloride and oral electrolytes.
(ii) Calcium Replenishers: Calcium gluconate*.

**(c) Acid base Regulators:** Ammonium chloride*, Potassium citrate.

**(d) Dialysis fluids:** Haemodialysis fluids and intraperitoneal dialysis fluids.

**Unit – III**

**Definition, Preparation, Properties, tests for purity & Assay of selected compounds(*) and Uses.**

**(a) Mineral Nutrients:**

Haematinics: Ferrous Sulphate* Ferric ammonium citrate, Ferrous gluconate.

**(b) Pharmaceutical aids:**

(i). Adsorbents & Absorbents: Activated charcoal, Aluminium sulphate.
(ii). Antioxidants: Sodium bisulphite and Sodium metabisulphite.
(iii). Desiccants: Silica gel.

(iv). Excipients: Magnesium stearate*, Talc.
(v). Suspending agents: Bentonite, colloidal silica.
(vi). Colourants: Titanium oxide, ferric oxide.

**Unit – IV**

**Definition, Preparation, Properties, tests for purity & Assay of selected compounds(*) and Uses.**

**(a)** (i). **Expectorants:** Potassium Iodide*.
(ii). **Emetics: C**opper Sulphate.
(iii). **Antidotes:** Sodium thiosulphate*, sodium nitrite.

**(b) Topical agents:**

(i). Astringents: Zinc sulphate, Calcium Hydroxide.
(ii). Topical protectants: Zinc oxide, Calamine.
(iii). Silicone polymers: Activated Dimethicone.
(iv). Anti infectives: Potassium permanganate*, Silver nitrate*, Iodine*, Iodine solutions, Povidone – iodine, boric acid*.

**Unit – V**

**Definition, Preparation, Properties, tests for purity & Assay of selected compounds(*) and Uses**

**(a) Dental products:**

(i). Fluorides: Sodium fluoride and stannous fluoride, sodium mono chloro phosphate.
(ii). Oral antiseptics and Astringents: Hydrogen peroxide, zinc peroxide.
(iii).Dentifrices: Calcium carbonate, calcium phosphate.
(iv). Cements and Fillers: Zinc oxide.

**(b) Other Medicinal agents:**

(i). Anti-thyroid agents: Potassium perchlorate.
(ii). Diagnostic agent: Barium Sulphate*.
(iii). Surgical aid: Plaster of Paris.

**Examination:** One question from each unit with internal choice.

**Text Books**

1. Pharmaceutical Chemistry, Inorganic G.R Chatwal volume-I Reprint 2010 , Himalaya publish House, Hyderabad.
2. Bentley & Driver's Text book of Pharmaceutical chemistry Ed: L. M. Atherden, 1983, Oxford University press, Delhi.
3. Pharmaceutical Inorganic chemistry, V. Alagarsamy, 2014, Pharmamed Press, Hyderabad.
4. Inorganic Medicinal & Pharmaceutical chemistry; J. H. Block, F. B. Roche, T.O. Soine, C.V. Wilson, 1986, Varghese publishing house, Bombay.
5. Inorganic Pharmaceutical chemistry; P. Gundu Rao, Vallabh Prakashan 1995, Delhi

**Reference Books**

1. Pharmacopoeia; (Indian, British, US and European)
2. Martindale: The Extra Pharmacopoeia; 31st Edn, 1996, The Royal Pharmaceutical Society.
3. Remington Pharmaceutical sciences; 20th Edition Lippincott Williams and Wilkins.
4. Hand Book of Pharmacy & Health care Ed: Robin. J. Haiwan 1990, The Pharm Press, UK.

# BASIC COMPUTER APPLICATIONS-I

| **Scheme of Instruction** | | **Scheme of Examination** | |
|---|---|---|---|
| Total Duration | : 40 hrs | Maximum Marks | : 100 |
| Periods / Week | : 3 | Internal Exam | : 30 |
| Credits | : 3 | End Semester | : 70 |
| Instruction Mode | : Lecture | Exam Duration | : 3 Hrs |
| Subject Code | **:** PY.05.881.1.2.T | | |

## Course Objectives

- To Impart the basic knowledge about the concept of computers.
- To make the students to understand and acquire knowledge about various simple computer applications.

## Course Outcomes

- The students will get basic concepts on working of a computer.
- The students will get thorough knowledge on simple computer applications like MS word, Excel, and Power Point.
- The student will be able to apply these applications in other subjects also.

**UNIT – I: COMPUTER CONCEPTS:**
Evolution, Basic structure and Characteristics of computers; Types of memory chips; Study of various input – output devices like magnetic tapes, magnetic discs, MICR, OCR, CDROMS etc., Types of printers; Principles of flow charting; Importance of operating systems, detailed study of the operating systems MSDOS , UNIX and WINDOWS; Computer Viruses;

**UNIT – II: INTRODUCTION TO MS-OFFICE (WORD & EXCEL):**
**MS-Word:** Basics, working with files, working with text, formatting paragraphs, styles, lists, tables, Graphics, spellings and grammar and page formatting macros, table of contents.
**MS-Excel:** Basics, Spreadsheets, data types, formulas, Formatting, charts, graphs.

**UNIT – III: INTRODUCTION TO MS-OFFICE (POWER POINT & ACCESS):**
**MS-Power Point:** Power point basics, Views, Slide control, Apply design, Page setup, Templates, Background, Control, Color Screens, Transitions and animations, working with texts and working with graphics.
**MS–Access**: – Data base concepts, Screen layouts, Creating tables, Data sheet records, table relation ships, Sorting and filtering, Queries, forms, form controls, Sub forms, reports, importing, exporting, linking.

**UNIT – IV: INFORMATION INFRASTRUCTURE:**
**Internet and World Wide Web (WWW):** Structure and Organization of the WWW, Browsers, Information search in WWW, search engines, Pharmaceutical resources in WWW Types of indexing tools & search strategies; E-Mail.

**UNIT – V: INTRODUCTION TO HTML:**
Hyper Text Manuscript Language(HTML), Hypertext, Elements(Tags), Structure of HTML, Comments, Document body, Text formatting, Hyperlinks, lists, Tables, Colors, Images, Frames and Forms.

**Examination** : One question from each unit with internal choice.

**Text Books:**



1. Fundamentals of Computers by P.K. Sinha 2nd Edn, 1992, BPB Publications, New Delhi.

2. Working in Microsoft Office By Ron Mansfield,TATA MC Graw Hill Edition, New Delhi.
3. HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery by DT Editorial Services, Kogent Learning Solutions Inc, Dreamtech. Press, New Delhi.

# GENERAL PHARMACY

**Scheme of Instruction**

| | |
|---|---|
| Total Duration | : 50 hrs |
| Periods / Week | : 4 |
| Credits | : 4 |
| Instruction Mode | : Lecture |
| Subject Code | **:** PY.05.881.1.3.T |

**Scheme of Examination**

| | |
|---|---|
| Maximum Marks | : 100 |
| Internal Exam | : 30 |
| End Semester | : 70 |
| Exam Duration | : 3 Hrs |

**Course Objectives**

- To give a basic understanding and a historical account on starting of pharmacy education in India and other countries.
- To make the students of aware of various pharmacopoeias.
- To make the students understand various types of simple calculations in preparation and dispensing of different types of dosage forms.

**Course Outcome**

- The students will get an exposure and a comprehensive knowledge on the history of pharmaceutical education.
- The students will become aware of various pharmacopoeias and how to refer those books.
- The student will gain knowledge on various simple calculations involved in the preparation and dispensing of dosage forms and the excipients used.



**Unit – I**

**Pharmacy profession:** Pharmacy as a career, Pharmaceutical Education (Courses and affiliating bodies (PCI and AICTE)), Development of Pharmaceutical Industry in India, Brief introduction to Evolution of Pharmacy, European and American Pharmacy. Pharmacopoeia (IP, BP, USP), BPC, Martindale, Merck Index. Pharmacopoeial monograph contents, API and formulation monograph. Explanation of each term.

**Unit – II**

SI and imperial systems, inter conversions. Weighing - selection and care of weights and balances, sensitivity, minimum weighable quantities and calibration of weights.

**Pharmaceutical calculations:** Enlarging and reducing recipes; Percentage solutions, alligation, alcohol dilutes, proof spirit, molarity, molality, Normality, millimoles, milliequivalents and isotonic solution.

**Unit – III**

**Posology:** Factors influencing dose, Calculations of doses for infants and children based on age, body weight and body surface area.
**Prescription:** Definition, Parts, sources of errors and care required in handling prescriptions, modern methods of prescribing, Responding to prescription, pricing of prescription.

**Unit – IV**

**Containers and closures**: Definition, Ideal properties, Types of containers and closures, Materials used in preparation of containers and closures, labeling: Preparation, Cautionary and advisory labels, modern unit dose packaging (blister, strip, bubble) and storage conditions for medicinal products.



**Unit – V**

**Excipients:** Colouring agents, flavouring agents, sweetning agents, antioxidantants, preservatives, diluting agents, vehicles, surfactants, hydrocolloids (with respect to FDA approvals, wherever applicable).
**Medicinal Gases:** Official medical gases and uses, containers and fitting, handling and storage.
**Radio Pharmaceuticals:** Preparation, therapeutic and diagnostic uses.

**Examination :** One question from each unit with internal choice.

**Text Books**

1. Bentley's Text book of Pharmaceutics, E.A. Rawlins, 8th Edition, 1996, Bailliere Tindall, London.
2. Cooper & Gunn's dispensing for Pharmaceutical students, S.J.Carter, CBS Publishers, New Delhi.
3. Pharmaceutical Education, Harikishan Singh (History of Pharmacy in India & Related aspects), Volume- II, Vallabh Prakashan, Delhi.
4. A Textbook of professional pharmacy, N. K. Jain, S.N. Sharma, 6th Edition, 2016, Vallabh prakashan, Delhi.
5. R. M. Mehta, Dispensing Pharmacy, 3rd Edition, 2008, Vallabh Prakashan, Delhi.

**Reference Books**

1. Pharmaceutical dosage forms & Drug delivery systems, H.C. Ansel, 8th Edition, 2008, Lippincott Williams &Wilkins, London.
2. Cooper & Gunn's Tutorial pharmacy, S.J.Carter, CBS Publishers, New Delhi.
3. Dispensing of Medication, Ed. E.W. Martin, Mach Publishing Co., Eastern PA.
4. Lachman Leon, "The Theory and Practice of Industrial Pharmacy, Special Indian 3rd Edition, 2009, Varghese Publishing House, Mumbai.
5. Indian Pharmacopeia (2014), British Pharmacopeia, United States Pharmacopeia & Merck Index.

# HUMAN ANATOMY AND PHYSIOLOGY-I

| **Scheme of Instruction** | | **Scheme of Examination** | |
|---|---|---|---|
| Total Duration | : 40 hrs | Maximum Marks | : 100 |
| Periods / Week | : 3 | Internal Exam | : 30 |
| Credits | : 3 | End Semester | : 70 |
| Instruction Mode | : Lecture | Exam Duration | : 3 Hrs |
| Subject Code | **:** PY.05.881.1.4.T | | |

**Course Objectives**

- To impart knowledge and understanding on the anatomy and physiology of various systems of human body.
- To impart the knowledge on the inter relationship of various organs and their functions in the human body.

**Course Outcome**

- The students will be gaining a thorough understanding on various physiological functions of the organs of human body.
- This knowledge will become the basic foundation for understanding of pharmacology in higher semesters.



## Unit-I

**Introduction**: Scope of anatomy and physiology, basic terminologies (directional terms, plains, sections) and body cavities.

**The cell**: Definition, structure and functions of the cell and its components, transport of substances across cell membrane.

**The Tissues**: Definition, Classification, location, description, functions and properties of epithelial, connective, muscular and nervous tissues.

## Unit-II

**Osseous system**: Definition, structure, composition, functions and types of bones. Anatomy of axial and appendicular skeletal system bones. Types and movements of joints.

**Skeletal muscles**: Gross anatomy of muscle and physiology of muscle contraction. Neuromuscular junction.

## Unit-III

**Haemopoietic system:** Definition, composition and functions of blood. Haemopoiesis, blood groups and haemostasis.

**Lymphatic system**: Composition, formation, circulation and functions of lymph. Structure and functions of lymph node, spleen and thymus gland.

## Unit-IV

**Cardiovascular system:** Anatomy of heart and blood vessels, conducting system of heart, action potential, cardiac cycle, heart sounds and ECG. Circulation of blood: Pulmonary, systemic coronary and portal circulation; blood pressure and its regulation.

## Unit-V

**Special senses**: Anatomy and physiology of eye, ear, tongue, nose. Structure and functions of skin.



**Text Books**

1. Thakaore B, Gandhi P, Harit RD. Elements of human anatomy physiology and heath

Education, 21st Edition B.S. Shah Publishers, Ahmadabad.
2. Principles of Anatomy and Physiology by Ross & Wilson, 10th Edition 2007, Churchill Living stone Publishers, New York.

**Reference Books**

1. Human Physiology by C.C. Chatterjee, 11th Edition 1992, Medical Allied Agency, Kolkata,India.
2. Text Book of Medicinal Physiology by A.C. Guyton, W.B. Prism Books Pvt. Ltd.Bangaluru.
3. Principles of anatomy and physiology by Tortora G.J., and S.R.Grabowski, Volume I & II , John Wiley and Sons Inc, Singapore..

# MATHEMATICS

**Scheme of Instruction**

| | |
|---|---|
| Total Duration | : 50 hrs |
| Periods / Week | : 4 |
| Credits | : 4 |
| Instruction Mode | : Lecture |
| Subject Code | **:** PY.05.881.1.5.T |

**Scheme of Examination**

| | |
|---|---|
| Maximum Marks | : 100 |
| Internal Exam | : 30 |
| End Semester | : 70 |
| Exam Duration | : 3 Hrs |

**Course Objectives**

- To provide the students with the knowledge on basic mathematical equations and their applications in pharmacy.

**Course Outcome**

- The students will become aware of various simple mathematical equations and their uses in pharmacy.
- The students will get a hands on practice in solving the problems.

**UNIT – I:**

**Logarithms**: Logarithm of a real number to an arbitary base, Napierion Base – Theorems on Logarithms – Use of Tables.

**Trigonometry**: Measurement of angles, Trigonometrical ratios and simple relations connecting the complimentary and supplementary angles, Negetive angles sum and difference of two angles, sine and cosine formulae for multiple angles and half angles.

**UNIT – II:**

**Differential Calculus**: Functions, Limits, Differential coefficient rules, Differentiation of a sum, product and quotient of functions, Differentiation from first principles, Geometrical, Partial Differentiation.

**UNIT – III:**

**Integral Calculus**: Integration considered as converse of differentiation, simple integrations, standard forms like x dx, Sin (a x) dx, Cos (a x) dx,. Methods of substitution (simple examples) integration by parts. Calculations of areas of standard bodies using integration.

**UNIT – IV:**

**Matrices**: Matrices, basic definitions, matrix operations, transpose, adjoint inverse of a matrix, solution of linear systems of equations.

**UNIT – V:**

Linear and non-linear graphs; Equation of line.

Differential Equations: Definitions , order, degree of equation , equations in seperable forms, Linear equations.

**Examination** : One question from each unit with internal choice.

**Text Books:**

1. A text book of Mathematics by N.Krishna Murthy, S .Chand series, Volume- I and II, 28th Edition 2006, S.Chand Publication, New Delhi.

2. Deferential calculus by Shanti Narayan, S.Chand Publication, New Delhi.

**Reference Books:**

1. Higher Engineering Mathematics by Grewal 43rd Edition 2014, Khanna Publication, New Delhi.

# BIOLOGY

**Scheme of Instruction**

| | |
|---|---|
| Total Duration | : 50 hrs |
| Periods / Week | : 4 |
| Credits | : 4 |
| Instruction Mode | : Lecture |
| Subject Code | **:** PY.05.881.1.5.T |

**Scheme of Examination**

| | |
|---|---|
| Maximum Marks | : 100 |
| Internal Exam | : 30 |
| End Semester | : 70 |
| Exam Duration | : 3 Hrs |

**Course Objectives**

- To provide the student with basic knowledge on classification of plants, morphology and histology of plant parts.
- To provide the student with basic knowledge on animal cell, tissue and organ systems which are related to human systems.

**Course Outcome**

- The student will get on exposure to basic understanding on plants and and their parts and this knowledge will be useful in understanding the pharmacognosy subject in higher semesters.
- The students will get an exposure and basic understanding on animal cell, tissue and organ systems which will have relation to human system.

## Unit – I

**Plant kingdom:** classification

**Plant cells:** Its structure, living and non-living inclusions. Different types of plant tissues and their functions.

**Histology:** root, stem, barks, woods & leaf.

**Unit-II**

**Morphology:** root, stem ,leaf, inflorescence, flower and fruit.

**Modifications:** root, stem & leaf.

## Unit – III

**Plant Taxonomy:** Classification, study of the following families with special references to medicinal and economically important plants: a) Apocynaceae b) Solanaceae c) Umbelliferae d) Leguminosae e) Scrophulariaceae.

## Unit – IV

**The study of animal cell:** Cell division, difference between plant cell and animal cell, Histology of liver, kidney, skeletal muscles, smooth muscles, pancrease, intestine and endocrine glands of rabbit.

## Unit – V

**Morphology and Life History of Human Parasites:** plasmodium, entamoeba, tapewarm, ascaris.and Trypanosoma Life history of Mosquitoes and housefly as agents for spreading diseases.

**Examination :** One question from each unit with internal choice.

**Text books**

1. A class book of botany, by A.C. Dutta, 17th Edition 2000, Oxford University, New Kolkatta.
2. A text book of biology by Vikram series
3. Texonomy of Angiosperms by V.K Jain, 2nd Edn. 1992-93, Rastogi Publications. Meerut. India.

**Reference books**

1. Invertebrate zoology by E.L Jordan & P.S verma, 30the Edition 2002. S.Chand & Company Ltd, New Delhi.
2. Chordate Zoology by E.L Jordan & P.S Varma, 26th Edition 2003. S.Chand & company Ltd. New Delhi.

# PHARMACEUTICAL INORGANIC CHEMISTRY - PRACTICAL

| **Scheme of Instruction** | | **Scheme of Examination** | |
|---|---|---|---|
| Total Duration | : 48 Hrs | Maximum Marks | : 100 |
| Periods / Week | : 4 | Internal Exam | : 30 |
| Credits | : 2 | End Semester | : 70 |
| Instruction Mode | : Practical | Exam Duration | : 4 Hrs |
| Subject Code | **:** PY.05.881.1.6.P | | |

## Course Objectives

- To give a practical training on the preparation and assay of some of the pharmaceutical compounds studied in theory.

## Course Outcome

- The students will get hands on experience and knowledge about the methods of preparation and assay of the compounds.

### List of Experiments

1. Systematic qualitative analysis for cations /anions (for any two inorganic mixtures)
2. Pharmacopoeial limit test for Chlorides
3. Pharmacopoeial limit test for Sulphates.
4. Pharmacopoeial limit test for iron.
5. Preparation of Boric acid.
6. Preparation of Sodium citrate.
7. Preparation of Potash alum.
8. Preparation of Ferrous sulphate.
9. Preparation of Ammonium chloride.



### Reference Books

1. A.H Beckett and J.B Stenlake, **Practical Pharmaceutical Chemistry**, 4th Edition, CBS Publications, New Delhi, 2004.
2. G Svehla, **Vogel's Qualitative Inorganic Analysis**, 7th Edition, Pearson Education, New Delhi, 2003.
3. B. Subba Rao and V. Alagarsamy, **Practical Pharmaceutical Inorganic Chemistry,** Pharma med Press, 2009, Hyderabad.
4. G. Devala Rao, **Practical Pharmaceutical Inorganic Chemistry**, Birla Publications, New Delhi, 2006.
5. K. R. Mahadik and S.H Bhosale, **Hand book of Practical Chemistry (Inorganic & Organic)**, Nirali Prakashan, Pune, 2007.
6. **Indian Pharmacopoeia-2014**, Controller of Publications, Delhi.

# BASIC COMPUTER APPLICATIONS -I PRACTICAL

**Scheme of Instruction**

| | |
|---|---|
| Total Duration | : 48 Hrs |
| Periods / Week | : 4 |
| Credits | : 2 |
| Instruction Mode | : Practical |
| Subject Code | **:** PY.05.881.1.7.P |

**Scheme of Examination**

| | |
|---|---|
| Maximum Marks | : 100 |
| Internal Exam | : 30 |
| End Semester | : 70 |
| Exam Duration | : 4 Hrs |

**Course Objectives**

- To provide hands on practice on working on the computer system for various kinds applications studied in theory

## Course Outcomes

- The students will gain hands on experience on the computer system for various kinds applications studied in theory
- The students will gain hands on experience on the computer system for writing simple programs.
-

## List of Experiments

A minimum of 25 exercises are to be conducted, as per the list given below.

1. Exercised Based on DOS commands (6)
2. Exercises based MS Word (3)
3. Exercises based on MS Excel (3)
4. Exercises based on MS Access (2)
5. Exercises based on Power Point. (2)
6. Exercises based on Information search engines,
7. Exercises based on HTML

**Reference Books**

1. Sanjay Saxena, **A First Course Computers**, Vikas Publishing House Pvt Ltd, New Delhi, 2003.
2. Sanjay Saxena, **MS Office 2000 for Everyone**, Vikas Publishing House Pvt Ltd, New Delhi, 2003.

# HUMAN ANATOMY AND PHYSIOLOGY-I PRACTICAL

**Scheme of Instruction**

| | |
|---|---|
| Total Duration | : 48 Hrs |
| Periods / Week | : 4 |
| Credits | : 2 |
| Instruction Mode | : Practical |
| Subject Code | **:** PY.05.881.1.8.P |

**Scheme of Examination**

| | |
|---|---|
| Maximum Marks | : 100 |
| Internal Exam | : 30 |
| End Semester | : 70 |
| Exam Duration | : 4 Hrs |

## Course Objectives

- To train the students to study various physiology / anatomy related measurements studied in theory.
- To get a personalized exposure and knowledge on those measurements.

## Course Outcome

- The students will acquire certain skills to handle and use some basic equipment.
- The students will get practical and personal experience on various kinds of experiments.

1. Study of compound microscope.
2. Study of histological slides of different tissues/organs
3. Study of various models, specimens of bones/organs
4. Determination of blood groups.
5. Determination of Hemoglobin content of blood.
6. Estimation of Bleeding Time
7. Estimation of Clotting Time
8. Determination of Total RBC count of blood.
9. Determination of Total WBC count of blood.
10. Determination of differential WBC count
11. Measurement of Blood Pressure
12. Measurement of vital Capacity
13. Estimation of Erythrocyte Sedimentation Rate (ESR).
14. Recording of human Heart Rate and Pulse Rate.
15. Study of different Family Planning methods.

## Note: Discuss the disorders of various systems.

## Reference Books

1. S.R. Kale and R.R. Kale, **Practical Human Anatomy & Physiology**, Nirali Prakashan.
2. CL Ghai, **Text book of Practical Physiology**, Jay Pee, New Delhi.