**I Year I Semester**

**PHR16111 – ENGLISH (50Hrs)**

**DETAILED TEXT-I : Recommended Topics :**

1. **THE KNOWLEDGE SOCIETY- APJ KALAM (RAVINDRA PUBLISHERS) 07**

**OBJECTIVE**: To make the learners rediscover India as a land of Knowledge.

**OUTCOME:** The learners will achieve a higher quality of life, strength and sovereignty of a developed nation.

1. **MAN’S PERIL (RAVINDRA PUBLISHERS) 06**

**OBJECTIVE**: To inform the learner that all men are in peril.

**OUTCOME:** The learner will understand that all men can come together and avert the peril.

1. **IN LONDON: M.K.GANDHI (RAVINDRA PUBLISHERS) 06**

**OBJECTIVE:** To apprise the learner how Gandhi spent a period of three years in London as a student.

**OUTCOME**: The learner will understand how Gandhi grew in introspection and maturity.

1. **PRINCIPLES OF GOOD WRITING: L.A.HILL (RAVINDRA PUBLISHERS) 06**

**OBJECTIVE**: To inform the learners how to write clearly and logically.

**OUTCOME**: The learner will be able to think clearly and logically and write clearly and logically.

**Text Book** : ‘Sure Outcomes’ by Orient Blak Swan Pvt. Ltd Publishers

**NON-DETAILED TEXT: (From Modern Trailblazers of Orient Blackswan)**

**(Common single Text book for two semesters)**

**(Semester I (1 to 4 lessons)/ Semester II (5 to 8 lessons)**

1. **G.D.Naidu 07**

**OBJECTIVE:** To inspire the learners by G.D.Naidu’s example of inventions and contributions.

**OUTCOME:** The learner will be in a position to emulate G.D.Naidu and take to practical applications.

1. **G.R.Gopinath 06**

**OBJECTIVE:** To inspire the learners by his example of inventions.

**OUTCOME:** Like G.R.Gopinath, the learners will be able to achieve much at a low cost and help the common man.

1. **Sudhamurthy 06**

**OBJECTIVE:** To inspire the learners by the unique interests and contributions of Sudha Murthy.

**OUTCOME:** The learner will take interest in multiple fields of knowledge and make life worthwhile through social service.

1. **Vijay Bhatkar 06**

**OBJECTIVE:** To inspire the learner by his work and studies in different fields of engineering and science.

**OUTCOME:** The learner will emulate him and produce memorable things.

**Text Book :**  ‘Trail Blazers’ by Orient Black Swan Pvt. Ltd. Publishers

**I Year I Semester**

## PHR16112 - Remedial Mathematics –I (50Hrs)

**(For Biology stream students)**

**UNIT – I 10**

**Algebra:**

**Arithmetic Progression‑Geometric Progression**‑ Permutations &combinations‑Binomial theorem partial fractions‑Matrices‑Determinants‑Application of determinants to solve simultaneous equations (Cramer's Rule).

**UNIT II 10**

**Trigonometry**: Trigonometric ratios and the relations between them Sin (A+B), Cos (A+B), Tan (A+B) formulae only. Trigonometric ratios of multiple angles‑Heights and distances (simple 000 problems there on).

**UNIT III 10**

**Co‑ordinate Geometry:** Distances between points‑Area of a triangle, Co‑ordinates of a point dividing a given segment in a given ratio‑locus‑equation to a straight line in different forms‑Angle between straight lines‑point of intersection.

**UNIT IV 05**

**Differential Calculus:** Continuity and limit: Differentiation, derivability and derivative, R.H. derivatives and L.H. derivatives, Differentiation, General theorems of derivation.

**UNIT V 10**

**Integral Calculus**: Integration as on inverse process of differentiation, definite integrals, integration by substitution, integration by parts, integration of algebraic function of Ex evolution of area in simple cases.

**UNIT VI 05**

**Differential equations:** Formation of a differential equation, order and degree, solution of first order differential equations, Laplace transformation.

# TEXT BOOKS

1. Intermediate first Year mathematics
2. Intermediate Second year mathematics, printed and published by Telugu Academy, Himayatnagar, Hyderabad
3. Pharmaceutical Arithmetic’s by Mohd. Ali CBS publishers and distributor, New Delhi.
4. Higher Engineering Mathematics by Grewal.
5. A text book of remedial mathematics, 2nd Ed. by P. Seshagiri Rao.
6. Pharmaceutical Statistics by Gopala Krishna Murthy, Srinivasa Babu and Seshagiri Rao

**I Year I Semester**

## PHR16112 - REMEDIAL BIOLOGY – I (50Hrs)

**(For Maths stream students)**

**Unit –I:** **Cell biology, histology and anatomy. 10**

Prokaryotic and eukaryotic cells.

Ultra structure of plant cell and its organelles, differences between plant and animal cells.

Detailed study of ergastic substances, chromosomes, nucleic acids. Introduction to cell cycle, mitosis and meiosis. Different types of plant tissues and their functions. Plant tissue systems. Histology and anatomy of root, stem, bark, wood, leaf, flower, fruit and seed

**Unit –II:** **Morphology 10**

General characteristics, types, functions and modification of root, stem and leaf, venation.  
Morphology of bark and wood. Inflorescence, structure and general description of flower, insertion of floral parts on the thalamus, Placentation. Morphology and classification of fruits, Morphology of seed.

**Unit –III: Plant Taxonomy 09**

Functions and principles of Taxonomy, methods of classification of plants. Binomial nomenclature. Technical description of a flowering plant. Eichler’s system of classification. Bentham and Hooker’s system of classification. Description of selected families - Malvaeceae, Solanaceae and Liliaceae.

**Unit –IV: General survey of Animal kingdom 10**

Basics of Classification (levels of organization, symmetry, Diploblastic, Triplobalstic organization, Coelom, Segmentation, Notochord), concept of species and taxonomic hierarchy.

Classification of animal kingdom.

General characters of Non-chordates (Protozoa, Porifera, Cnidaria, Platyhelminthes, Nemathelminthes, Annelida, Arthropoda, Mollusca and Echinodermata).

General characters of Hemichordata and Chordata.(Pisces, Amphibians, Reptiles, Aves and Mammals).

**Unit –V: 07**

Parasitism and Parasitic adaptations.

Structure and life history of Protozoans: Amoeba, Entamoeba, Trypanosoma and Plasmodium.

Structure and life history of Helminthic parasites: Taenia solium, Wuchereia bancrofti and Ascaris lumbricoides.

**Unit- VI: 04**

General characters of phylum Arthropoda.

General structure and life history of insects: Cockroach, Mosquito and Silk worm.

TEXT BOOKS

1. Intermediate First Year and Second Year Botany / Zoology Text Books printed and published by Telugu Academy, Himayatnagar, Hyderabad.
2. A.C. Dutta, Text Book of Botany
3. Botany for Degree students Vol. - I & II by B.P. Pandey

**I Year I Semester**

**PHR16113 - HUMAN ANATOMY & PHYSIOLOGY - I (50 Hrs)**

**UNIT-I**

**Scope of Anatomy and physiology:** 05

Structure of cell , its components and their functions.

**Elementary Tissues of the human body**: Epithelial, connective, muscular and nervous tissues, their sub‑ types and properties.

**Skeletal muscles:** 04

Gross anatomy, physiology of muscle contraction, physiological properties of skeletal muscles and their disorders.

**Skeletal system:** 04

Structure, composition and functions of skeleton. Classification of joints, types of movements at joints, disorders of joints.

*LO:* To understand different tissues are involved in the formation of organs and perform different functions. For example skeletal muscle produce by way of its contraction and relaxation produce movement of the skeletal, nerves are involved in the transmission of electrical impulses, bones form body frame, muscles produce contraction and help in movement, circulation, digestion and excretion. Epithelial tissues protect and secretes juices.

**UNIT-II** 08

**Haemopoietic system:**

Composition and functions of blood, Genesis and regulation of red blood cells production, blood groups, transfusion of blood. Leukocytes, properties of white blood cells, reticulo endothelial system, blood coagulation and its mechanism, formation and circulation of lymph. Disorders of blood.

**Formed elements of blood:** WBC, RBC and Platelets,

Heamopoiesis and blood hormones, Blood groups and their significance, Coagulating factors, Pathways of coagulation and Mechanism of coagulation, Disorders of blood.

*LO:* Blood is involved in oxygen and carbon dioxide transport, maintenance of B.P, defense immunity and excretion.

**UNIT III**

**Cardiovascular system**: 08

Basic anatomy, structure and functions of the heart and blood vessels, action potential. Excitatory and conductive system of the heart, cardiac cycle, nervous regulation of heart. Systemic coronary and hepatic blood circulation, cardiac output, blood pressure in different blood vessels, blood pressure regulations and measurements. ECG of heart. Brief outline of cardiovascular disorders like hypertension, hypotension, atherosclerosis, angina, myocardial infarction, congestive heart failure and cardiac arrhythmias.

**Lymph and Lymphatic System**: 03

Composition, formation and circulation of lymph; disorders of lymph and lymphatic system. Basic physiology and functions of spleen.

*LO:* Heart and blood vessels maintain BP, transport gases, nutrients and waste products. Their function is essential to sustain circulation.

**UNIT IV** 07

**Respiratory System:** Anatomy of respiratory organs. Functions of respiration, mechanism and regulation of respiration, respiratory volumes and vital capacity.

*LO:* To know above external and internal respiration exchanging of gases, need of oxygen for metabolism of nutrients and generation of energy and is essential for life process.

**UNIT V** 06

**Digestive System:** Anatomy, structure and functions of different parts of gastrointestinal tract, motility of alimentary canal and its regulation. Gastrointestinal secretions, their compositions, function and regulations. Digestion of food in mouth, stomach and small intestine and its absorption.

*LO:* To understand digestion in various parts of GIT, role of enzymes and secretions involved in the process of digestion and their function.

**UNIT VI** 05

**Urinary System**: Structure and functions of Nephron, formation of urine, renal mechanism for concentrating and diluting the urine, regulation of acid-base balance, knowledge on release of renin from kidney and its fuctions. Regulations of blood volume and extra cellular fluid volume. Disease related to kidney.

*LO:* To understand how urine is formed and various mechanisms involved in formation of urine and diseases related to the kidney.

**TEXT BOOKS**

1. Tortora, G.J and Anagnodokas, Principles of Anatomy and Physiology, N.P Harper & Row Publishers N.Y
2. C.C.Chatterjee, Human Physiology.
3. Ross & Wilson, Anatomy-Physiology in health and illness.
4. Donald.C Rizzo, Fundamental of Anatomy and Physiology.
5. Dr. Jayaveera K.N., Vrushabendra Swamy B.M., Human Anatomy Physiology and Health Education, S.Chand publ.

**REFERENCES**

1. A.C.Guyton, Text Book of Medical Physiology
2. Best & Taylor, The Living Body-A Text Book on Human Physiology

**I Year I Semester**

**PHR16114 – GENERAL & DISPENSING PHARMACY (50Hrs)**

**UNIT-I 6**

Historical back ground and development of profession of Pharmacy & pharmaceutical industry in brief. Development of Indian Pharmacopoeia & other pharmacopoeias such as BP,USP, European Pharmacopoeia, Extra Pharmacopoeia & Indian national formulary.

*LO:* To understand the development of pharmacy profession & various pharmacopoeias.

**UNIT-II 10**

**Dispensing Pharmacy** : Principles of dispensing, form of prescription, handling of prescription, source of errors for prescription, care required in dispensing procedures including labeling of dispensed products. Weights and Measures, introduction to Latin terms, Percentage calculations, allegation method, proof spirit calculations, displacement value and calculations of iso tonicity adjustment. General dispensing procedure- posology calculations of doses.

*LO:* To understand dispensing principles, procedures, calculations involved , doses.

**UNIT-III 10**

**Principles involved and procedures adopted in dispensing of the following classes of preparations.**

1. Mixtures
2. Solutions – A study of the following solutions – Cresol with soap solution IP, Aqueous Iodine solution IP, Strong solution of Iodine IP, weak iodine solution IP, strong solution of Ammonium acetate.
3. Emulsions
4. Powders
5. lotions & liniments
6. ointments

*LO:* To understand principles and procedures involved in the dispensing of various categories of

products.

**Unit-IV 08**

**Dosage forms –** Purpose, classification, definitions and general characteristics of the following dosage forms

*Solids:* Tablets and capsules.

*Liquid orals:* Elixirs, Syrups, Lectures, Suspensions and Emulsions.

*Liquids for external use:* Lotions & liniments applications.

*Semi solids:* Ointments, Creams, Gels, Suppositories and Pessaries.

*LO:* To understand dosage forms and their general characteristics.

**UNIT-V 08**

**Incompatibilities:** Physical, chemical and therapeutic incompatibilities – methods of overcoming and handling of incompatible prescriptions.

*LO:* To understand incompatibility and methods of overcoming incompatibility.

**UNIT-VI 08**

**Extraction and Galenical products:** Principle and methods of extraction - preparation of infusions, tinctures, dry, soft and liquid extracts.

*LO:* To understand extraction and Galenical products – Principles and procedures.

**TEXT BOOKS**

1. Cooper & Gunns Dispensing Pharmacy, CBS, Publ. and Distributors New Delhi.
2. R.M Metha, Dispensing Pharmacy.
3. NK Jain and GD Guptha, Modern Dispensing Pharmacy, Pharma Med Press.
4. Sanmathi BS and Anshu Guptha, Dispensing Pharmacy – A Practical Manual, Pharma Med Press.
5. General Pharmacy by M.L.Schroff.
6. General Pharmacy by Cooper & Gunn.

**REFERENCES**

1. Lippincott Williams and Wilkins, Remington Pharmaceutical Sciences.
2. E.A. Rawlkins, Bentley’s Text Book of Pharmaceutics, Elbs publ.
3. Hoover, Dispensing of Medication.

**I Year I Semester**

**PHR16115 - PHARMACEUTICAL ORGANIC CHEMISTRY-I (50Hrs)**

**UNIT-I 08**

**Structure and reactivity of organic molecules:** Types of chemical bond and hybridization,Polarity of bonds, electronic effects: Electromeric effect, Inductive effect, Mesomeric effect and Hyperconjugation and their influence on the properties of organic molecules; charged species: carbocations and carbanions, their generation, stabilities, rearrangement in the case of carbocations; Free radicals: formation and stability

*LO:*Understanding the basic concepts influencing the reactivity of organic molecules, understanding the mechanisms wherever applicable, applications of the above in the interpretation of various properties of organic molecules.

**UNIT-II 10**

**Alkanes and cycloalkanes:** Nomenclature, general methods of preparation, free radical substitution, chain and conformational isomerism in the case of alkenes and their relative stabilities, Bayer’s strain theory and Sachse-Mohr theory in the case of cycloalkanes and their limitations.

**Alkenes:** Nomenclature, general methods of preparation, characteristic electrophilic and free radical addition reactions, orientation of product formation as interpreted by Markonikov’s ruleand peroxide effect (Anti-Markonikov’s rule), ozonolysis and allylic substitution.

**Alkadienes:** Nomenclature, stability of conjugated dienes, 1,2- and 1,4- reactions and their relative stabilities.

**Alkynes:** Nomenclature, general methods of preparation, characteristic reactions with emphasis on acidity of one alkynes, formation of metal acetylides, stereospecific reduction of alkynes and addition of water involving keto-enol tautomerism

*LO:* Structures, equations involved in the preparations, mechanism of formation or the reaction, rearrangements if any, discussion on stabilities and applications of the characteristic reactions in synthesis.

**UNIT-III 08**

**Alkylhalides:** Nomenclature, general methods of preparation, significance of nucleophilic subsititution of alkylhalides in organic synthesis, mechanisms and salient features of SN1 and SN2 reactions with examples including the proof in favor of these reactions, a comparison of SN1 and SN2, elimination reactions (E1 and E2): mechanisms, salient features and orientation of product formation in terms of Saytzeff’s rule and Hoffmann orientation.

*LO:*Structures, equations involving the methods of preparations and reactions, stabilities and applications of the reactions.

**UNIT-IV 08**

**Alcohols:** Nomenclature, classification, methods of preparation, industrial synthesis of ethanol and methanol, reactions of alcohols involving the replacement of hydroxyl or replacement of the hydrogen of the hydroxyl, iodoform reaction and Lucas test.

**Ethers:** Nomenclature, William sons synthesis, action of hydroiodic acid on ethers.

*LO:* Structures, general properties, equations involving the methods of preparation and reactions, mechanisms, reactivities.

**UNIT-V 10**

**Stereochemistry:** Isomerism and its comparison to stereoisomerism, stereoisomers, optical isomers (enantiomers), characteristics of enantiomers (chirality), racemic mixtures, methods of separation of racemic mixtures, optical activity, optical rotation, specific rotation, plane of symmetry and centre of symmetry, diastereomers, their properties and required characteristics with examples as given by Fischer projection formulae; mesoform and its characteristics; Configuration: relative configuration (D and L), absolute configuration (R and S); Geometric isomerism: cis-trans isomerism and E and Z nomenclature.

*LO:* Stereochemical structures, importance of stereochemistry with respect to drugs as interpreted in terms of reactivity and the properties of chiral drugs.

**UNIT-VI 06**

**Grignard reagent:** Preparation, characteristic nucleophilic addition and substitution reactions, applications in organic synthesis and limitations.

**LO:** Structure, mechanism and usefulness in synthesis.

**TEXT BOOKS**

1. T.R. Morrison and R.N. Boyd, Organic chemistry, pentice hall of India private limited, New Delhi.
2. Arun Bahl & Bahl, Advanced Pharmaceutical Organic Chemistry.
3. C. N. Pillai, Text book of Organic Chemistry.
4. Bhupinder Mehta, Manju Mehta, Organic Chemistry.

**REFERENCES**

1. R.L Madan, *Organic Chemistry.*
2. Lloyd N. Ferguson, Text book of Organic Chemistry, 2nd edition,.
3. Raj K Bansal, A textbook of Organic Chemistry, 5th edition.

**I Year I Semester**

**PHR16116 – ENGLISH COMMUNICATION SKILLS LAB**

**Suggested Lab Manual:**

**OBJECTIVE:** To impart to the learner the skills of grammar as well as communication through listening, speaking, reading and writing including soft, i.e., life skills.

**I:** **Listening and Speaking Skills:**

To impart verbal and non-verbal communication skills through the following:

(a). dialogues and body language

(b). interviews and group discussions

(c). Debate and Elocution

(d). Phonetics.

**II:** **Reading and Writing Skills:**

To impart reading and writing skills through the following:

1. Summarizing and abstracting.
2. Case writing
3. Office and business drafting like circular, Notice, Memo, enquiry letter, order letter, complaint letter and leave letter.
4. Career skills like applying for a job, resume preparation, covering letter and e-mail writing etiquette.

**TEXTBOOKS:-**

1. Strengthen your communication skills, Part B by Maruthi Publications.
2. Spoken English in 3 volumes with 6 cassettes, OUP (CIEFL).
3. T. Balasubramanian, A textbook of English Phonetics for Indian students (Macmillan).

**Reference books:-**

1. M.Ashraf Rizvi Effective Technical Communication (Tata McGraw Hill Companies)
2. Bhaskaran & Horsburgh Strengthen your English (Oxford University Press).
3. Andrea J Rutherfoord Basic Communication Skills for Technology (Pearson Education Asia).
4. Orient Longman English Skills for Technical students, WBSCTE with British Council.
5. P. Eliah A handbook of English for professionals. (Pharma book syndicate).
6. Judy Garton- Sprenger BBC, English stage 1 (B.B.C. English).
7. KK Ramchandran, Business communication (Macmillan).
8. SR Inthira and V Saraswathi, “ Enrich your English – a)Communication skills, b)Academic Skills”, (CIEFL and OUP).
9. Mohan Krishna & Banerji Meera. Developing communication skills (Macmillan).

**I Year I Semester**

**PHR16117 – REMEDIAL BIOLOGY LAB**

1. Study of Simple and compound microscopes used in biology.
2. Section cutting, staining and mounting of sections.
3. Histological studies of the Leaf , Stem and Root with description of their stained sections.
4. Description and study of floral characters of the plants representing the families in theory.
5. Observation of permanent slides.

**I Year I Semester**

**PHR16118 - GENERAL & DISPENSING PHARMACY LAB**

1. Dispensing of prescriptions falling under the categories; Mixtures, solutions, emulsions, creams, ointments, powders, pastes, lotions, liniments, inhalations, paints. etc.
2. Identification of various types of incompatibilities in a prescription, correlation thereof and dispensing of such prescriptions.
3. Dispensing procedures involving pharmaceutical calculations, pricing of prescriptions and dosage calculations for pediatric and geriatric patients.
4. Dispensing of prescriptions involving adjustment of tonicity.

*A total 50 prescriptions are to be dispensed.*

**I Year I Semester**

**PHR16119 - PHARMACEUTICAL ORGANIC CHEMISTRY - I LAB**

Introduction to Equipment & Glassware

Re crystallization method, determinations of Melting point, Boiling Point and distillation

**I. Preparation of organic compounds (each involving a specific organic reaction covered in theory)**   
1. N.Acetylation: Preparation of Acetanilide from Aniline   
2. 0-Acetylation: Preparation of Aspirin from salicylic acid  
3. Nuclear Nitration: Preparation of m-Dinitrobenzene from nitrobenzene  
4. Oxidation: Preparation of Benzoic acid from Benzyl chloride  
5. Esterification: Preparation of n-Butyl acetate from n-Butyl alcohol  
6. Etherification: Preparation of α-Naphthyl metl ether from α–Naphthol

7. Halogenation: Preparation of Iodoform from Iodation of acetone

8. Extensive Nuclear Substitution: Preparation of Tribromophenol

9. Bromination of Tribromo aniline from Phenol or Aniline

**II. Systematic qualitative Analysis (Identification) of Mono functional Organic**

**Compounds:**Avoid water-soluble compounds, and compounds containing more than one functional group;

at least six individual compounds to be analyzed.

**REFERENCES**

1. Vogel’s Text Book of Practical Organic Chemistry, 5” Edition.
2. R.K. Bansal, Laboratory Manual of Organic Chemistry.
3. O.P. Agarwal, Advanced Practical Organic Chemistry.
4. F.G.Mann & B.C. Saunders, Practical Organic Chemistry.