COURSES OF STUDY FOR B.Sc.:

Preparatory Year

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<th>First Semester</th>
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<th>Course</th>
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<td>Lect.</td>
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<td>Organic chemistry</td>
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<td>Physics</td>
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<td>Fundamentals of Human Anatomy, and Histology</td>
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<td>Pharmacy orientation and History of Pharmacy</td>
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<td>Computer Science</td>
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PREPARATORY YEAR

First term:
1. Botany:
Taxonomical characteristics of the important plant families. Plant cell differentiation and cell content. General macroscopical and microscopical characteristics of morphological groups (leaf, flower, seed fruit, ...etc.).
Plant physiology: Ultrastructure and functions of plant cell organelles; enzymes as catalyst in metabolism with specific reference to synthetic pathways.

2. Zoology:
Invertebrates including Animal Taxonomy; biological and life cycle of the following Phyta: Protozoa, Coelenterata, Platyhelminthes, Annelida, Arthropoda. Functional anatomy of the cell, membranous organelles of the cytoplasm, nonmembranous organelles of the cytoplasm, the cytoplasmic inclusions, the nucleus.

3. Physical and General Chemistry:
States of matter, thermochemistry, chemical equilibria, thermo-dynamics, chemical kinetics and electrochemistry. Structure of the atom, chemical bonding and radioactivity. Identification of acid and basic radicals of simple inorganic salts.

4. Essentials of Mathematics and Statistics:
Algebra; linear equations and curve fitting, Analytical geometry; Probability and statistics. Calculus including differentiation, integration and differential equations.

5. English Language and Terminology:
Paragraph writing and punctuation; translation (seen and unseen); Conversational and idiomatic English; Scientific passages for eating; Linguistic exercises.
6. Accounting and Pharmacy Administration:
Accounting principles (include nature and purposes of account and accounting records and recording financial transactions, preparing results of operation and financial position statements). Accounting information and it's role in planning, organizing, directing and controlling.
Second term:
1. Organic Chemistry
Carbon compounds and chemical bonds, Introduction, the development of organic chemistry, the structural theory of organic chemistry. Isomerism, constitutional isomers, chemical bonds: the octet rule, writing Lewis structures, formal charge, molecular orbitals, the structure of methane: sp3 hybridization, orbital hybridization and the structure of alkenes, orbital hybridization and the structure of alkynes, reagent types, reaction types, representative carbon compounds, functional groups, alkyl halides or Haloalkanes, ethers, amines, aldehydes and Ketones, carboxylic acids, amides and esters, physical properties and molecular structure, structure and physical properties, polar covalent bonds, acids and bases, tautomerism, alkanes and Cycloalkanes, introduction to alkanes and Cycloalkanes, IUPAC nomenclature of alkanes, nomenclature of unbranched alkyl groups, nomenclature of branched-chain alkanes, nomenclature of cycloalkanes, monocyclic compounds, nomenclature of branched Alkyl groups, classification of hydrogen atoms, physical properties of Alkanes and Cycloalkanes, synthesis of Alkanes and Cycloalkanes, hydrogenation of Alkanes, reduction of Alkyl halides, lithium dialkylcuprates: The Corey-Posner, While-Sideshous synthesis, halogenation of higher alkanes regioselectivity, alkenes, nomenclature of alkenes and Cycloalkenes, structure and bonding in Alkenes, isomerism in Alkenes, naming stereoisomeric alkenes by the E-Z notational system, physical properties of Ikenes, relative stabilities of alkenes, synthesis of Alkenes via elimination reactions, dehydro-halogenation of alkyl halides, E2 reactions: Zaitsev's rule, dehydration of alcohols, mechanism of alcohol dehydration, carbocation stability and the occurrence of molecular rearrangement, alkenes by debromination of vicinal dibromides, addition to alkenes, addition of hydrogen halides to Alkenes: Markovnikov's rule, theoretical explanation of Markovnikov's rule, modern statement of
Markkobnikov's rule, addition of sulfuric acid to alkenes, addition of water to Alkenes: Acid catalyzed hydration, addition of bromine and chlorine to alkenes, mechanism of halogen addition, stereochemistry of the addition of halogens to alkenes, halohydrine formation, Epoxides and Anti hydroxylation of alkenes, alcohols from Alkenes through, oxymercuration demmercuration, alcohols from Alkenes through hydroboration-oxidation, the stereochemistry of the Oxidation of Organoboranes, radical addition to alkenes: Anti-Markovnikov's rule, (addition of hydrogen bromide), oxidation of alkenes: syn hydroxylation of alkenes, oxidative cleavage of alkenes, alkynes, source of alkynes, structure and bonding in Alkynes: Sp hybridization, physisical properties, acidity of acetylene and terminal alkynes, preparation of alkynes by alkylation of acetylene and terminal alkynes, dehalogination of dihalides, hydrogination if alkynes, metal-amonia reduction of alkynes, addition of hydrogen halides to alkynes, hydration of alkynes, addition of halogens to alkynes, factors influencing electron-availability, inductive and field effect, mesomeric effect, time-variable effect, hyperconjugation, steric effect, the strengths of acidity in organic compounds, the influence of solvent, simple aliphatic acids, substituted aliphatic acids, phenols, aromatic carboxylic acids, dicarboxylic acids, pka and temperature, aliphatic bases, heterocyclic bases, acid/base catalysis, specific and general base catalysis.

2. Physics:
A- Bio-Electricity:

Chapter II: Physics of Membranes
Nernst Equation, Cell membrane, Membrane Dielectric Constant, Transport of Charged Particles Through Membrane.
Chapter III: Physics of The Nerve

Chapter IV: Alternating Current

Chapter V: Basic Electronics
The Electronic Structure of Solids, The Semiconductors Rectifier, The Transistors, The Cathode-Ray Oscilloscope,

Chapter VI: Stimulating Currents & Electro-Biological Sensors.

B- Physics of Therapeutic Heat and Cold
Chapter I:

Chapter II:
Heat and Cold in Therapy, Shortwave Diathermy, Heating by Microwave, Ultrasonic Waves.
General Problems & Solved Examples
Light:
1- Nature of light and the wave Theory:
Introduction and general properties, wave motion, huygens principle, rectilinear propagation of light, reflection of a plane wave from a plane surface, refraction of a plane wave from a plane surface, spherical waves. diverging and converging waves, reflection of spherical wave from spherical surface, refraction of spherical wave from spherical surface, the power and the focal length of a refracting surface, magnification.
2- Thin Films:
   Introduction, formula of a thin lenses, lenses in contact, the system of thin lenses and the thick lenses, surface focal lenses and surface power, equivalent power and principal planes.

3- Astigmatic Lenses:
   Plano-cylindrical lenses, spherocylindrical lenses, toric lenses, images formed by Astigmatic lenses.

4- The Human Eye:
   The physical structure of the Human Eye, resolving power of the Eye or visual Acuity, optical charts.

5- Optical Instruments:
   The Microscope (simple-compound)

6- Dispersion of Light Spectra
   The optical Spectrum, the complete electromagnetic spectrum, achromatic prism combination, direct vision spectroscope, spectra: types of spectra.

7- Ultraviolet and Infrared Radiations:
   A- Ultraviolet Radiations:
      Nature and General Properties, effects of U.V. radiations, sources of Ultra Violet Radiations, the Ultraviolet Spectrometer.
   B- Infrared Radiations:
      Nature and general properties, sources of Infrared Radiations, detection of Infrared Radiations, the Infrared Spectrometer.

8- X-Rays:
   The properties of X-rays, the production of X-rays, interactions of electrons with the target, absorption of x-rays, diffraction of x-rays, Bragg's Law, Gragg's x-rays spectrometer, Measurement of a wave length of x-rays, Spectra of x-rays, (Continuous spectrum-line spectrum), characteristic of x-ray spectrum.
3. Essentials of Human Anatomy and Histology

3.1. Anatomy:

3.2. Histology:

4. Pharmacy orientation and History of Pharmacy

Introduction to Pharmacy

1- Introduction
2- Recent Pharmaceutical Education and Organizations
3- Terminology and Important Definition
4- Drug Information Services and Community Pharmacy
5- Ethics in Pharmacy and Oath of the Pharmacist
6- Scope and Career of Pharmacy, and Duties of the Pharmacist
7- Self Care
8- Rational Drug Use
9- Essential Drug List National
10- Evolution of Pharmacy, Practice of Pharmacy, Pharmacist in the governments.
11- Routes of administration.

- مفهوم مهنة الصيدلة ونبذة تاريخية عامة عن الصيدلة بمصر
- مصادر ومراجع تاريخ الصيدلة وفوائد دراستها
- منشأ مهنة الصيدلة
- الصيدلة في مصر القديمة
- المدارس الطبية والخاصة في المهن الطبية عند الفراعنة
- الدراسات الطبية والدوائية المصرية القديمة كدسائل ومراجع دوائية
- الصيدلة في العصور الوسطى
- الصيدلة في العصر الإسلامي
- الصيدلة في مصر في العصر الإسلامي العربي (الدولة الطولونية - الدولة الأخشادية - الدولة الفاطمية)
- المشاهير العرب في الصيدلة
5. Computer Science:
Introduction to computers; Development of computers; DOS system, DOS commands, DOS functions; Files and directories, word processing. Basic, command system, Input and output operations, variables and data processing.

6. Psychology:
The units of study and analysis range from the individual to formal groups and organizations. Selected social and behavioral science concepts are presented explaining their relationship to health and disease.