



Curriculum for the Bachelor Degree in Medicine and Surgery

First Year Syllabus



MEDICAL PHYSICS

Subject: Medical Physics

Code number: 0302100

Credit hours: 2 hours

Course designation: First year/ First semester

Department: Physics (College of Science)

Course syllabus:

- 1- Mechanical impulse, dynamic concepts Tension-elastic concepts
- 2- Mechanical energy
- 3- Biomechanics
- 4- Physical agents with electric absorption and magnetic: Electrostatic energy, basic circuits, different types of flow: Pulsated , sinoidal, progressive Electric radiation and different tissues, magnetic field induction and variation Biological involvement of biological structures under the magnetic field
- 5- Physical agent's absorption electro magnetic non ionizing: basic theory of magnetic radiation Medical instrumentation using this type of energy bands
- 6- Pulsated and short waves, radiotherapy, microwaves and their effects on biological system
- 7- Physical agent with ionizing absorption: X-ray, natural, generation, filters, absorption and effects on biological system Dosimetry, machines, Linear accelerators
- 8- Mechanics for fluids; physiological involvement, Bernoulli's law consequence and applications, impedance and frequency Caudal physiological equation, capillary net, pressure distribution Turbulence in medicine
- 9- Oscillation waves, types, characteristics Mechanics waves, ultrasound Doppler effect and medical application



GENERAL AND ORGANIC CHEMISTRY

Subject: General and Organic Chemistry

Code No: (0303108) and (0303003)

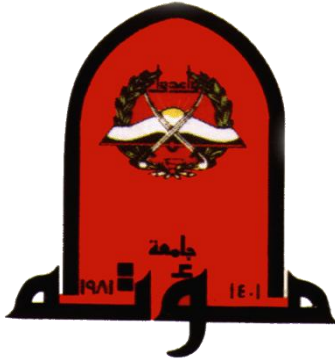
Credit hours: 4 hours (3 Theoretical and 1 Practical)

Course designation First year/ First semester

Department: Chemistry (College of science).

COURSE CONTENT:

- 1- Atomic structure and bonds
- 2- Acids, bases and buffers
- 2- Alkanes, Cycloalkanes and alkyl halides
- 3- Unsaturated hydrocarbon compounds, Alkenes and Alkynes
- 4- Unsaturated compounds Aromatic Compounds
- 5- Stereoisomerism
- 6- Alcohols, Phenols & Thiols
- 7- Ethers and Epoxides
- 8- Aldehydes and Ketones
- 9- Carboxylic Acids and Their Derivatives
- 10- Amines and Related Nitrogen Compounds
- 11- Bioorganic compounds, Carbohydrates and Heterocyclic Compounds



CELL BIOLOGY

Subject: Cell biology

Code number: 1501101

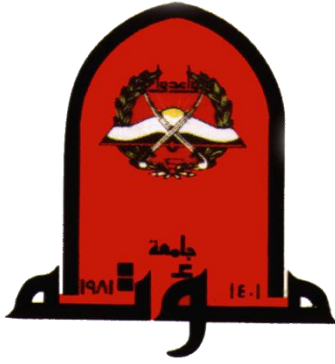
Credit hours: 1 hour

Course designation: First year/ first semester

Department: Anatomy

Course syllabus:

- 1- Introduction :
 Importance of studying the cell in medicine and biology
- 2- Basic structure of the cell
- 3- The concept of prokaryote and eukaryote
- 4- Methods and means of study of the cell
- 5- Chemical foundations
- 6- water
- 7- Carbohydrates
- 8- Lipids
- 9- Nucleic acids, Proteins, The enzymes
- 10- Membrane structure and function
- 11- The nucleus structure
- 12- DNA ,RNA , and protein synthesis
- 13- Chromatin, chromosomes and genes
- 14- Cytoplasm
- 15- Bioenergetics
- 16- Endocytosis, degradation of cellular components, and exocytosis
- 17- Reception, transduction and signaling pathways
- 18- Cytoskeleton
- 19- Cellular interactions and extra cellular matrix
- 20- Cell cycle, and cell death
- 21- Mitosis
- 22- Meiosis



GENERAL ANATOMY

Subject: General Anatomy

Code number: 1501102

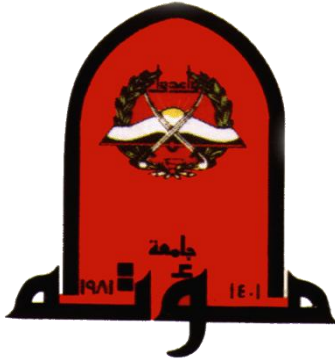
Credit hours: 4 hours

Course designation: First year/ Second semester

Department: Anatomy

Course syllabus:

- 1- Anatomical Terminology
- 2- Skeleton of upper limb and joints
- 3- Vessels of upper limb
- 4- Brachial plexus and its branches
- 5- Bones and joints of lower limb
- 6- Compartments Muscle of lower limb, action and nerve supply
- 7- Lumbosacral plexus
- 8- Vessels of lower limb (ANL)
- 9- Thoracic cage
- 10- Heart and pericardium
- 11- Mediastinum lung & pleura
- 12- Anterior and posterior abdominal wall, inguinal canal
- 13- Peritoneum, stomach and liver
- 14- Small and large intestine and pancreas
- 15- Suprarenal, kidney, Ureter and bladder
- 16- Abdominal aorta, inferior vena cava, portal vein
- 17- Pelvic wall & floor, and vessels
- 18- Male and female genital system
- 19- Skull, cervical vertebrae & TMJ
- 20- Scalp and face, triangles of the neck
- 21- Musculoskeletal unit of the neck
- 22- Visceral unit of the neck
- 23- Neurovascular unit
- 24- Brain and spinal cord



25- Cranial nerves

GENERAL HISTOLOGY

Subject: General Histology

Code number: 1501103

Credit hours: 3 hours

Course designation: First year/ Second semester

Department: Anatomy

Course syllabus:

Lectures

- 1- The Cell
- 2- Epithelium 1
- 3- Epithelium 2
- 4- Connective Tissue 1
- 5- Connective Tissue 2
- 6- Cartilage & Bone
- 7- Bone (cont.)
- 8- Blood 1
- 9- Blood 2
- 10- Muscular Tissue 1
- 11- Muscular Tissue 2
- 12- Nervous Tissue 1
- 13- Nervous Tissue 2
- 14- Nervous Tissue 3
- 15- Blood vessels
- 16- Lymphoid Tissue 1
- 17- Lymphoid Tissue 2
- 18- Integument
- 19- Respiratory system
- 20- Digestive system



Practical Laboratories

- 1- Microscopy & The cell
- 2- Epithelial Tissues
- 3- Connective Tissue
- 4- Cartilage & Bone
- 5- Blood
- 6- Muscular Tissues
- 7- Nervous Tissues 1
- 8- Nervous Tissues 2
- 9- Blood vessels
- 10- Lymphoid Tissues
- 11- Skin
- 12- Respiratory System
- 13- Digestive System 1
- 14- Digestive System 2



GENERAL EMBRYOLOGY

Course title: General Embryology

Code number: 1501104

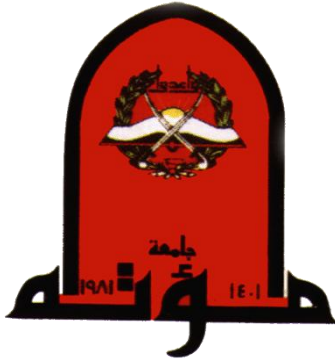
Credit hours: 1 hour

Course designation: first year / Second semester

Department: Anatomy

Course syllabus:

- 1- Introduction
- 2- Reproductive systems male and female
- 3- Gametogenesis 1: oogenesis, ovulation, uterine , corpus luteum and ovarian/ cycles
- 4- Gametogenesis 2: spermatogenesis
- 5- Fertilization, cleavage and blast cyst formation
- 6- Implantation and second week of development
- 7- Second week of development :bilaminar embryonic disc
- 8- Third week of development :gastrulation and trilaminar embryonic disc
- 9- Neuralation and ectoderm germ layer derivatives
- 10- Mesoderm germ layer and its derivative
- 11- Folding and gut formation
- 12- Embryonic period and fetal period
- 13- The placenta and fetal membranes
- 14- Prenatal diagnosis
- 15- Congenital malformation (birth defect) : chromosomal and genetic causes
- 16- Congenital malformation - environmental causes



GENERAL PHYSIOLOGY

Course title: General Physiology

Code number: 1502101

Credit hours: 3 hour

Course designation: first year / Second semester

Department: Pharmacology and Physiology

Course syllabus:

1 Introduction to physiology

- The internal environment and homeostasis
- Body fluid
- Diffusion
- Osmosis
- Transport of ions & molecules through the cell membrane

2 Overview of

Respiratory and renal system and their role in acid – base balance

3 Excitable Membrane Physiology

Muscle and nerves

4 Overview of

- Autonomic nervous system
- Sensory function of nervous system
- Motor function of nervous system

5 Overview of

Cardiovascular System



Lectures:

8 Lectures to cover for:

Subjects

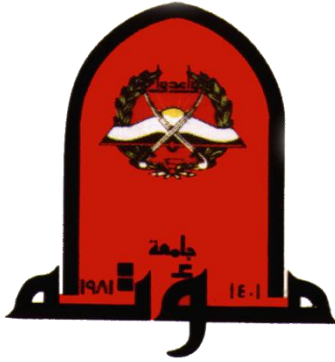
- Introduction to physiology
- Homeostatic mechanisms
- The internal environment (extracellular fluid)
- The control systems of the body
 - a- negative feedback
 - b- positive feedback
- Transport of ions and molecules through the cell membrane
 - a- Diffusion (passive transport)
 - b- Active transport, co-transport, and counter-transport
- Body fluid
 - a- total
 - b- compartments
 - c- measurement of body fluid volumes
- Basic principles of osmosis and osmotic pressure
- Equilibrium when a change occurs in the volumes and osmolalities and how to calculate fluid shifts
- Edema
 - a- intracellular
 - b- extracellular

9 Lectures to cover the excitable membrane

(Muscle and Nerve):

Subjects

- Origin of bioelectric potentials (The Donnan effect and Gibbs-Donnan equation)
- Ionic bases of the resting membrane potential (RMP)
 - a- nerve
 - b- muscles

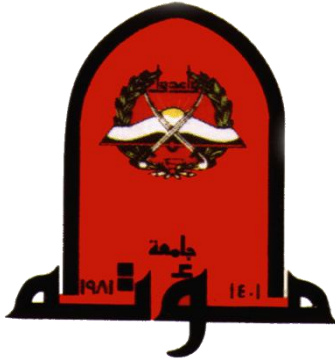


- Calculation of the RMP using Nernst equation and Goldman-Hodgkin-Katz (GHK) equation
- Ionic bases of action potential (Na, K, and Ca gates) and its properties
 - a- nerve action potential
 - b- sk muscle action potential
 - c- smooth muscle action potential
 - d- cardiac muscle action potential (five phases)
 1. non-pacemaker action potential
 2. pacemaker action potential
- Propagation of action potential (nerve and muscle)
- The refractory period (nerve, skeletal muscle, cardiac muscle, and smooth muscle)
- Rhythmicity of some excitable tissues
- Excitation of excitable tissues
- Chemical synaptic transmission and synaptic potentials
- Neuromuscular junction and neuromuscular transmission
- The end plate potential and its ionic bases
- The all or none law for excitation and contraction
- The excitation contraction coupling and molecular bases of sk muscle contraction (role of Ca^{++} , troponin, and tropomyosin)
- Mechanics of muscle contraction (isometric, isotonic, and auxotonic contraction)
- Force-velocity relationship and length-tension relationship
- Summation of contraction (clonus and tetanization)
- Smooth muscle contraction; neural and hormonal control)
- The motor unit and recruitment technique
- Resting tension (tone) in the three types of muscles

3 Lectures for overview of the autonomic nervous system:

Subjects

- Introduction and general organization
- Chemical transmission of autonomic junctions (cholinergic and adrenergic transmission)



- Types of cholinergic and adrenergic receptors
- Effect of sympathetic and parasympathetic stimulation on specific visceral organs
- Autonomic reflexes and their role in the regulation of visceral functions

3 Lectures to cover:

- Overview sensory functions of nervous system
- Overview motor functions of nervous system

8 Lectures to cover for Cardio vascular system:

Subjects

- Overview of the CVS
 - The myocardium versus the skeletal muscle
 - The concept of the preload, afterload, and the myocardial contractility
 - The Frank-Starling law of the heart
 - The contractility and Ca^{++} kinetics
 - The cardiac cycle and cardiac output
 - The heart sound and murmurs
 - The electrical activity of the heart
 - The electrocardiography
 - The control of heart rate and cardiac arrhythmias
 - Hemodynamics
- a- Blood pressure and blood flow
b- Microcirculation and lymphatics

5 Lectures to cover for respiratory system and its role in acid-base balance:

Subjects

- Overview of the respiratory system
- Mechanical aspects of breathing
- The respiratory cycle and lung volumes and capacities
- Pulmonary ventilation versus alveolar ventilation
- Pulmonary circulation



- Gas diffusion and gas transport (O_2 and CO_2)
- Hypoxia and asphyxia and artificial respiration
- Regulation of respiration (chemical versus non-chemical control)
- Blood pH and the buffer systems of the body
- Role of the lung in metabolic acidosis and alkalosis



GENERAL BIOCHEMISTRY

Course title: General biochemistry

Course code: 1503101

Credit hours: 3 credit hours (2 hrs lectures + 1 hr laboratory)

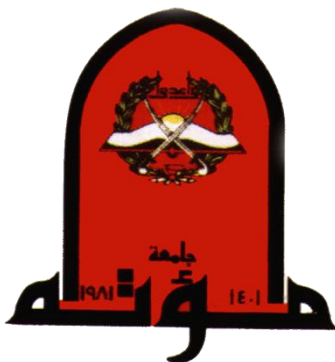
Course designation: first year / Second semester

Department: Pharmacology and Physiology

Course syllabus:

Lectures

- 1- Introduction into biochemistry
- 2- Chemical composition of biomolecules
 - Functional groups
 - Chemical reactions
- 3- Classes of macromolecules
- 4- pH and buffers
- 5- Amino acids
 - Classes
 - Properties
- 6- Polypeptides
 - Peptide formation
 - Structure (examples of fibrous and globular proteins)
 - Ionic properties
 - Folding
 - Physiological significance
- 7- Proteins
 - Structure
 - Denaturation
 - Classification
 - General functions
- 8- Enzymes-General description
 - Nomenclature



- Classification
- Specificity
- Isozymes
- 9- Enzyme-Kinetics
 - Michaelis-Menten equation
 - Lineweaver-Burke plot
 - Competitive versus non-competitive inhibition
 - Other influencing factors (pH, temperature)
- 10- Enzyme-Regulation
- 11- Enzymes-Cofactors and vitamins
 - Types and physiological roles
- 12- Clinical enzymology
- 13- Bioenergetics
 - Free energy
 - Endergonic and exergonic reactions
 - High energy compounds
- 14- Chemistry of carbohydrates
 - Classification
 - Isomerization
- 15- Chemistry of lipids
- 16- Introduction of metabolism
 - Glycolysis
 - β -oxidation of fatty acids
 - Degradation of amino acids
- 17- Energy metabolism
 - Krebs cycle
 - Respiratory chain reaction
 - Oxidative phosphorylation

Practical laboratories

- 1- Laboratory safety and data collection
- 2- Liquid handling and pipetting
- 3- Preparation of solutions



- 4- Preparation of buffers and determination of pH
- 5- Determination of enzyme activity
- 6- Quantification of proteins by spectrophotometry
- 7- Isolation of proteins by size-exclusion chromatography
- 8- Detection of carbohydrate



MOLECULAR BIOLOGY

Course title: Molecular biology

Course code: 1503102

Credit hours: 2 hours

Course designation: first year / Second semester

Department: Pharmacology and Physiology

Course syllabus:

Lectures

1- Introduction

Significance of molecular biology and genetics in biology and medicine

Living systems and experimental models

History of molecular biology and genetics; genes are heritable entities

2- DNA and RNA structures

General characteristics of DNA and RNA structures

Chemical nature of DNA

DNA electrophoresis and Southern blotting

3- Structure of chromosomes

Chromosomal structure and chromatin in prokaryotes (chromosomes and plasmids) and eukaryotes

Chromosomal karyotyping

4- DNA replication

DNA replication in prokaryotes and eukaryotes

5- Concept of genes and genomes

Relationship between DNA and proteins

The role of RNA

Major types of RNA molecules

What is a gene?



Prokaryotic vs eukaryotic genes

- 6- RNA and gene transcription
 - Types of RNA in prokaryote and eukaryotes
 - Transcription in prokaryote and eukaryotes
 - Post-transcriptional regulation
- 7- Translation
 - Translation in prokaryote and eukaryotes
 - Post-translational regulation
- 8- DNA mutations and chromosomal anomalies
 - Types of chromosomal anomalies
 - Examples of genetic diseases
 - Types of DNA mutation
 - Examples of genetic mutations in human cancer
- 9- Mechanisms of DNA repair
- 10- Signal transduction
 - General principles
 - Examples of signaling pathways
- 11- Genomics, proteomics, and bioinformatics

Practical laboratories

- 1- Liquid handling and pipetting
- 2- Spectrophotometry and determination of DNA concentration
- 3- Concept of restriction endonucleases, RFLP, and DNA cloning
- 4- DNA fingerprinting
- 5- Concept of DNA electrophoresis
- 6- Extraction and measurement of plasmid DNA
- 7- Concept of polymerase chain reaction (PCR)
- 8- Performance of PCR
- 9- Performance of DNA electrophoresis
- 10- Bioinformatics



BIOSTATISTICS

Subject: Biostatistics

Code number: 1506102

Credit hours: 3 hours

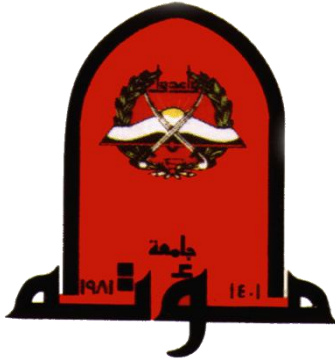
Course designation: First year/ summer semester

Department: Public Health and Community Medicine

Course syllabus:

Lectures

- 1- Introduction to biostatistics
- 2- Sources of data
- 3- Types of data: Quantitative variables (continuous, discrete)
- 4- Types of variables: Qualitative Variables (Nominal, ordinal)
- 5- Research methods: Descriptive methods (cross section study, correlation study)
- 6- Research Methods: Analytical Methods (cohort, case control study)
- 7- Presentation of data: Tabular presentation (Simple frequency, Contingency, Two way classification and complex tables)
- 8- Presentation of data: Graphical presentation (Line graph, Bar chart, Histogram, Frequency polygon, Pie chart)
- 9- Presentation of data: Mathematical presentation (Measures of central tendency, and measures of dispersion)
- 10- Inferential statistics: Normal curve and standard scores
- 11- Inferential statistics: Percentiles
- 12- Inferential statistics: Probability distribution
- 13- Inferential statistics: Central limit theory
- 14- Inferential statistics: Abnormalities of data distribution
- 15- Inferential statistics: Sampling methods (simple random sample, systematic random sample, stratified sample, cluster sample, and non-probability samples)
- 16- Test of significance for quantitative data (eg t-test, analysis of variance)



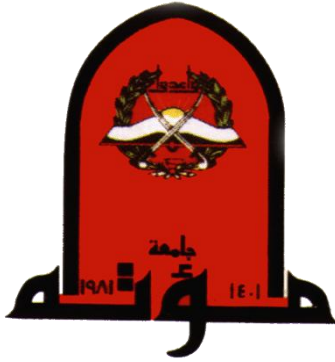
- 17- Test of significance for qualitative data (Chi square)
- 18- Correlation and regression analysis

Seminars

- 1- Areas under the normal curves
- 2- Types of errors in statistical analysis
- 3- Confidence interval
- 4- Types of variables in experimental study
- 5- Problem solving: on different statistical issues

Clinical Training (computer Lab)

- 1- Training on the use of SPSS in statistical analysis
- 2- Preparation and formatting variables and its typing in an SPSS data file
- 3- Computation and transformation of data (eg coding)
- 4- Use of SUBROUTINES Frequency and CROSSTAB for presentation and tabulation of data
- 5- Use of SUBROUTINE GRAPH to establish BAR, LINE, HISTOGRAM, FREQUENCY POLYGON, and PIE graphs
- 6- Performance of t-Test
- 7- Performance of Chi Square
- 8- Performance of ANOVA
- 9- Performance of correlation and Regression analysis



Basic Medical Terminology
(A Body Systems Approach)

Course Title: Medical Terminology

Course Number: 1500101

Credit Hours: 3

Course Time: First semester/16 weeks

Instructors: Dr. Samir Mahgoub and Dr. Nedal Al-Nawaseh

Course Description: This medical terminology course covers the basic knowledge and understanding of medical language and terminology used by health care professionals everywhere. This knowledge will enable medical students to become successful communicators (especially in the health care setting).

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Use prefixes, suffixes, word roots, and combining vowels to built and define medical terms.
2. Recognize and define common medical symbols, abbreviations, diagnostic tests and procedures.
3. Acquire a basic speaking vocabulary.
4. Use basic medical language in written communication.
5. Interpret the meaning of medical terms used in written and verbal communication.

Course Objectives:

1. Describe how medical terms are created.
2. Learn and understand medical terms by breaking them down into their component parts and learning the meaning of those parts.
3. Know how and where to use basic medical suffixes and prefixes accurately.
4. Construct singular and plural forms of terms.
5. Defines directional terms and anatomic planes of the body.
6. Identify selected body systems structures and their related word parts.
7. Use system word parts, prefixes, and suffixes to build and define words.
8. Define medical terms related to selected diseases.
9. Define selected diagnostic and surgical procedural terms for each body system.
10. Identify and understand various instruments utilized in a physical examination as they relate to specific body parts.
11. Recognize different medical specialties and medical specialists.
12. Describe commonly used treatment modalities for each body system.
13. Recognize selected abbreviations related to each body system.



14. Spell, pronounce, and use specific medical terms.

Course outline:

I. Introduction to Medical Terminology

- i. Acronym (Short form, as AIDS for: acquired immune deficiency syndrome)
- ii. Eponym (e.g. Alzheimer's disease)
- iii. word parts
- iv. modern language

B. Word Parts

- i. word roots
- ii. suffixes
- iii. prefixes
- iv. combining vowel

C. Learning medical terms

- i. connecting word parts
- ii. defining terms using the meaning of the word parts
- iii. spelling
- iv. pronunciation
- v. forming plurals
- vi. using medical terms in written and verbal communication

D. Body Structure

E. Body organization

F. Anatomic planes

G. Directional terms

II. Selected Terminology by Body Systems

- A. Structures and word parts
- B. Functions and word parts
- C. Diseases and disorder terms
- D. Diagnostic test and equipment
- E. Surgical procedural terms
- F. Area of study and specialists
- G. Signs, symptoms and related terms
- H. Abbreviations

Assessment Type:



First Exam	30%
Second Exam	30%
Final Exam	40%

Recommended Books (Available in our library)

1. Medical terminology made incredibly easy.

Author: Springhouse Corporation.
Publisher: Springhouse Corp.,
Publication Date: c2001.
Publication Place: Springhouse, Pa. :
ISBN: 1582550417

2. Current medical terminology

Author: Pyle, Vera.
Publisher: Health Professions Institute,
Publication Date: 2000.
Publication Place: Modesto, Calif. :
ISBN: 0934385335 (pbk.)

3. Using medical terminology : a practical approach

Author: Nath, Judi L.
Publisher: Lippincott Williams & Wilkins,
Publication Date: c2006.
Publication Place: Philadelphia :
ISBN: 0781748682

4. Solving the puzzles in medical terminology : an interactive study guide to accompany the telecourse Medical terminology

Author: Wetle, Victoria L. , Longshore, Glen.
Publisher: Jones and Bartlett Publishers,
Publication Date: c1997.
Publication Place: Boston :
ISBN: 0763702145
9780763702144

5. Introduction to medical terminology

Author: Besser, Pam., Fisher, J. Patrick.
Publisher: McGraw-Hill Higher Education ; McGraw-Hill [distributor],
Publication Date: 2005.



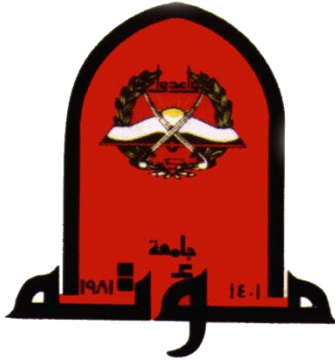
Publication Place: New York : London :
ISBN: 0073013102 (pbk.)
9780073013107 (pbk.)

Other Books:

1. Basic Medical Language by Myrna LaFleur
2. Ann Ehrlich and Carol L. Schroeder. Medical Terminology for Health Professions, 6th Edition. Delmar Publishers, Inc., Albany, New York. ISBN: 9781418072520
3. Medical Terminology An Illustrated Guide, Sixth Edition; Barbara Janson Cohen; Lippincott Williams & Wilkins; ISBN: 1605476048
4. Brooks, M.L. Exploring Medical Language: A Student-Directed Approach, 7th ed. St. Louis, Missouri: Mosby Elsevier

16 Week Course Schedule

- **Introduction to the medical terminology**
 - Rational for studying medical terminology
 - Spelling and pronunciation of medical terms
- **Forming medical terms**
 - Word root
 - Combining forms
 - Prefix
 - Suffix
- **Anatomical Body Structure**
 - Directional Terms
 - Planes of The Body
 - Region of The Body
- **Integumentary System and colors**
 - Medical Terms & Abbreviations
 - Diagnostic & Procedural Terms
 - Pathological & Surgical terms
- **Respiratory System**



- Medical Terms & Abbreviations
- Diagnostic & Procedural Terms
- Pathological & Surgical terms

- **Digestive System**
- Medical Terms & Abbreviations
- Diagnostic & Procedural Terms
- Pathological & Surgical Terms

- **Cardiovascular, Blood, Lymph, and Immune System**
- Medical Terms & Abbreviations
- Diagnostic & Procedural Terms
- Pathological & Surgical terms

- **Special Senses and the Nervous System**
- Medical Terms & Abbreviations
- Diagnostic & Procedural Terms
- Pathological & Surgical terms

- **Musculoskeletal System**
- Medical Terms & Abbreviations
- Diagnostic & Procedural Terms
- Pathological & Surgical terms

- **Endocrine System**
- Medical Terms & Abbreviations
- Diagnostic & Procedural Terms
- Pathological & Surgical terms

- **Urinary System**
- Medical Terms & Abbreviations
- Diagnostic & Procedural Terms
- Pathological & Surgical terms

- **Reproductive System**
- Medical Terms & Abbreviations
- Diagnostic & Procedural Terms
- Pathological & Surgical terms



- **Diagnostic Procedures and Pharmacology**