

**B.SC. CARDIO PERFUSION TECHNOLOGY**

**R 2017**

**CURRICULUM**

## **UAH17CPT101 - APPLIED ANATOMY AND PHYSIOLOGY**

### 1. ANATOMY OF CARDIOVASCULAR SYSTEM

- o Gross anatomy and structural features of heart
- o GREAT VESSELS: Structure of blood vessels and its organization.

### 2. ANATOMY OF RESPIRATORY SYSTEM

- o Organization of the respiratory system
- o Gross structure and features of trachea and bronchial tree
- o Gross structure and histology of lungs

Pulmonary circulation – pulmonary arteries, pulmonary veins and bronchial arteries.

### 3. ANATOMY OF NERVOUS SYSTEM

- o Brain – location, gross features, parts, functional areas,  
Cerebral blood circulation.
- o Spinal cord – gross features, extent, blood supply and coverings.

### 4. ANATOMY OF RENAL SYSTEM

- o Organization of renal system
- o Kidneys: location, gross features, structure, blood supply and nerve supply
- o Ureters and urinary bladder – location, gross features and structure.

## APPLIED PHYSIOLOGY

### 1 Physiology of cardiovascular system

- o INTRODUCTION – Functions of CVS and blood circulation. Tissue perfusion and microcirculation
- o CARDIAC CYCLE – Various phases
  - Cardiac output – definition, measurements, regulation and control
  - Stroke volume, Arterial pressure and its regulation

Peripheral resistance, Venous return, Heart rate

### o LOCAL

- Vasodilation, Auto regulation (myogenic

theory) Vasodilator metabolites, kinins and vasoconstriction

#### o SYSTEMIC

- Circulatory vasoconstrictors
- Neural and hormonal regulatory mechanism
- Cardio inhibitory center
- Baro and chemo receptors
- Movement of fluids and dissolved solutes in the body
- Basics of electro cardio gram – Definition, electrical condition, atrial activation, atrial complex, ventricular activation, ventricular complex and normal values

## 2 PHYSIOLOGY OF RESPIRATORY SYSTEM

- Upper airway – nose, pharynx, larynx
- Lower airway – trachea bronchial tree
- The mucus blanket – mucus and cilia
- Lung parenchyma – alveoli, gaseous exchange, alveolar macrophages and surfactant.
- Physics of ventilation – principles of elasticity compliance and airway resistance.
- Mechanism and regulation of respiration
- Principles of gaseous exchange
- Concept of physiological shunt and its effect Brief concept of artificial ventilation

## 3 HAEMATOLOGY

- Components of blood – their normal values and functions
- Blood groups and briefly procedures involved in blood transfusion
- Briefly coagulation factors and coagulation cascade (Hemostasis)

## 4 PHYSIOLOGY OF RENAL SYSTEM

- Organization and functions of renal system
- Renal circulation and glomerular filtration rate
- Mechanism of urine formation and excretion
- Renal function tests

## UAH17CPT102 – BASIC BIOCHEMISTRY AND PHARMACOLOGY

### APPLIED BIOCHEMISTRY

- Proteins I: Composition and Structure
- Proteins II: Structure-Function Relationships in Protein Families
- Enzymes: Classification, Kinetics, and Control
- The Cytochromes P450 and Nitric Oxide Synthases
- Biological Membranes: Structure, Receptors, and Solute Transport
- Fundamentals of Signal Transduction
- Bioenergetics, Mitochondria, and Oxidative Metabolism
- Carbohydrate Metabolism I: Major Metabolic Pathways and Their Control
- Carbohydrate Metabolism II: Special Pathways and Glycoconjugates
- Lipid Metabolism I: Synthesis, Storage, and Utilization of Fatty Acids and Triacylglycerols
- Lipid Metabolism II: Pathways of Metabolism of Special Lipids
- Amino Acid and Heme Metabolism
- Purine and Pyrimidine Nucleotide Metabolism
- Metabolic Interrelationships
- Biochemistry of Hormones

### APPLIED BIOPHYSICS

- The Biochemical Structure and Function of the cell membrane
- Transport across cell membrane
- Active Transport Sodium and potassium channels
- Osmotic Pressure of Cells
- *Oncotic pressure and fluid mechanics*
- Solvent Accessible Surface Area
- Ion Channels and Ion Pumps
- Cytochrome Oxidase Enzymes
- A Simplified Model Calculation

- Principal of Fluid mechanics
- Gas liquid interphase
- Unit conversion to SI system.

## APPLIED PHARMACOLOGY

### 1. Cardiovascular drugs

- Antihypertensives
- Beta Adrenergic antagonists
- Alpha Adrenergic antagonists
- Peripheral Vasodilators
- Calcium channel blockers
- Antiarrhythmic drugs
- Cardiac glycosides
- Sympathetic and non sympathetic inotropic agents.
- Coronary vasodilators.
- Antianginal and anti failure agents
- Lipid lowering & anti atherosclerotic drugs.
- Drugs used in Homeostasis – anticoagulants

Thrombolytics and antithrombolytics, Fibrinolysis inhibitor

- Cardioplegic drugs- History, Principles and types of Cardioplegia.
- Priming solutions – History, principles & types.
- Drugs used in the treatment of shock.

### 2. Pharmacological protection of organs during CPB

### 3. Inhalational gases and emergency drugs.

### 4. Corticosteroids – Classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration.

### 5. Diuretics

### 6. Detailed review of drugs and fluids commonly added to the pump by the perfusionist and/or anaesthetist

- Mannitol
- Sodium bicarbonate
- Cardioplegic solutions

- Potassium, magnesium, and calcium ions
- \* Heparin
- \* Blood and blood products
- \* Crystalloid and colloid solutions
- \* Vasoactive drugs
- Anaesthetic vapour agents

## UAH17CPT103 – PHYSICS FOR PROFESSIONALISTS

An introduction to the properties of liquids and gases and the medical application of pressures in fluids and the cardiovascular system, mass and heat transfer as they apply to equipment used in extra- corporeal perfusion.

1. Introduction to thermal sciences, review of calculus
2. Pressure, hydrostatics, and intro concepts in thermodynamics
3. Conservation of mass
4. The first law of thermodynamics and mechanical energy balance
5. Applications of conservation of energy
6. Integral conservation of linear momentum
7. Concepts in cardiovascular fluid mechanics  
Flow through tubes
8. Intro to differential analysis and the continuity equation
9. The Navier-Stokes equations
10. Transport applications in cardiopulmonary bypass: oxygenation and ultrafiltration
11. Mass transfer and the differential component mass balance
12. Gas laws, solubility of gases
13. Volume, pressure, flow
14. Mass, density, viscosity
15. Heat units, temperature scales, heat transfer
16. Diffusion/osmosis
17. Molarity, concentrations
  - Sterilization and Disinfection
  - Cardiac operation Theatre Etiquette

**Reference Books:**

1. B.D.Chaurasia Human Anatomy
2. Khurana: Human Physiology
3. A. K. Jain Textbook of Physiology
4. U. Satyanarayna : Medical Biochemistry
5. K D Tripathi Pharmacology
6. Gravlee Cardiopulmonary Bypass: Principles and Practice

## **UAH17CPT104 – APPLIED PATHOLOGY AND HEAMATOLOGY**

### 1 CARDIOVASCULAR SYSTEM

- Atherosclerosis
- Ischemic heart disease
- Valvular heart disease
- Cardiac hypertrophy and hypertensive heart disease
- Cor pulmonale and pulmonary hypertension
- Myocarditis
- Cardiomyopathies
- Pericardial disease
- Endocrines and the heart
- Heart tumors
- Arrhythmias and conduction disorders
- Diseases of the aorta: Aneurysms and dissections

### 2 HAEMATOLOGY

- Anaemia – definition, morphological types and diagnosis of anemiabrief concept about haemolytic anaemia and polycythemia.
- Leukocyte disorders – briefly leukaemia, leukocytosis, agranulocytosis etc.,
- Bleeding disorders – definition, classification, causes and effects of important types of bleeding disorders. Briefly various laboratory tests used to diagnose bleeding disorders.
- . Blood Transfusion Techniques
- Blood grouping
- Minor and Major cross matching
- Venous Sample Collection
- Storing Techniques of Blood Products
- Blood collection from Donor

- Separation of the Blood products

### 3. RESPIRATORY SYSTEM

- Chronic obstructive airway diseases – definition and types
- Briefly concept about obstructive versus restrictive pulmonary diseases
- Pulmonary congestion and edema
- Pleural effusion – causes, effects and diagnosis

### 4. RENAL SYSTEM

- Clinical manifestation of renal diseases
  - Briefly causes, mechanism, effects of acute renal failure and chronic renal failure.
- Briefly glomerulonephritis and pyelonephritis  
Brief concept about obstructive uropathy

## **UAH17CPT105 – CLINICAL DIAGNOSTICS**

### **1. BASICS OF DIAGNOSTIC TECHNIQUES-**

- A. Laboratory investigations in relation to perfusion technology
- B. Chest of X-ray,
- C. ECG,
- D. ABG
- E. Angiography,
- F. 2 D Echo
- G. TEE

### **2. MONITORING AND INSTRUMENTATION-**

- A. Instrumentation technology of ECG machine, pressure transducers, syringe and
- B. peristaltic pumps, monitors, ventilators, pulse oximeters, temperature probes
- C. and thermo regulatory monitoring,defibrillators.
- D. Hemodynamic monitoring, Haemostatic monitoring.
- E. Maintenance of oxygen, carbon dioxide and acid base status andtheir monitoring
- F. Coagulation Monitoring
- G.  Coronary artery and graft flow measurement
- H.  Resuscitation and support
- I.  Catheterisation
- J.  Angiography
- K.  Angioplasty
- L.  EPS Studies
- M.  Valvuloplasty
- N.  Intra-aortic balloon

## **UAH17CPT106 - PRINCIPLES OF PERFUSION TECHNOLOGY**

### 1. PHYSIOLOGY OF EXTRA-CORPOREAL CIRCULATION

1. Assessment of patients before bypass; going on & coming off bypass.
2. Hemodilution and priming solutions
4. Principles of extracorporeal gas exchange
5. Analyzing & correction of ABG, VBG and other blood investigations

### 2. PERFUSION EQUIPMENT - HARDWARE:

1. Heart-lung machines/centrifugal pumps
2. Pressure and low level alarm devices
3. Heart-lung heater/coolers
4. Mechanical/electronic flow meters, blenders
5. Perfusion data's recording, store keeping
6. In-line oxygen saturation devices
7. In-line blood gas devices
8. Oxygen analyzers
9. Cell savers
10. Intra-aortic balloon pump

### 3. PATHOPHYSIOLOGY OF CPB

1. Blood cells trauma & Anticoagulation in bypass: its monitoring and complications

#### Blood conservation & Auto transfusion

- Risks of blood transfusion
- Blood conservation techniques

#### 2. Myocardial Protection & Cardioplegia

- History
- Various methods of myocardial protection
- Reperfusion injury, oxygen free radicals, myocardial edema
- myocardial protection for specific clinical problems
- problems during Cardioplegia delivery
- Hot shot

#### 3 Effects of CPB

- Immune and inflammatory response
- Fluid balance and interstitial fluid accumulation
- Nervous system
- Renal function
- The lungs
- The liver

#### 4 Hypothermia

- Physiology
- Deep Hypothermic Circulatory Arrest
- Alterations with temperature change
- Acid-base
- Organ function

#### **Reference Books:**

1. Pathology and Genetics for nurses K. Swaminathan
2. Text Book of pathology Harsh mohan
3. P J Mehta: Practical Medicine
4. Gravlee Cardiopulmonary Bypass:

## **UAH17CPT107 - CLINICAL APPLICATION OF CPB TECHNIQUES**

### 1. Conduct, Monitoring & Termination of CPB

#### Check lists

- \* Flow/pressure
- \* Hemodilution
- \* Acid/base balance
- \* Oxygen and carbon dioxide exchange
- \* Patient core temperature
- \* Anticoagulation
- \* Hypothermia
- \* Pressure, flow, resistance
- \* Adequacy of perfusion
- \* Myocardial preservation

#### **General bypass : Management of Adult cardiac cases**

#### **Coronary Artery Bypass Graft Surgery**

#### **Valvular Replacement**

#### **Surgery Fem-Fem bypass**

#### Emergency

### 2. Accidents and safeguards

## **UAH17CPT108 – PERFUSION FOR SPECIAL PROCEDURES**

1. Aortic Surgery
2. Management of Unusual Problems & Special Consideration in Perfusion
  - I. Sickle cell
    - A. Pathophysiology
    - B. Considerations for CPB
    - C. Other blood disorders
  - II. Methemoglobinemia
    - A. Pathophysiology
    - B. Considerations for CPB
  - III. Thalassemia
  - IV. Spherocytosis & elliptocytosis
  - V. Hemosiderosis & hemochromatosis
  - VI. Erythroblastosis fetalis
  - VII. Hereditary coagulation disorders
    - A. Von Willebrand's disease
      - a) Type I
      - b) Type II
      - c) Type III
    - B. Hemophilia A
    - C. Hemophilia B
  - VIII. Acquired coagulation disorders
    - A. Disseminated intravascular coagulation (DIC)
    - B. Primary fibrinolysis
    - C. Vitamin K dependent deficiency
  - IX. Platelet disorders
    1. Thrombocytopenia
    2. Cold Agglutinin
  - X. Perfusion techniques for Pregnant Patients.
  - XI. Malignant Hyperthermia.
  - XII Re-Operations

## **UAH17CPT109 – ADVANCED PERFUSION TECHNIQUES**

1. ECMO
2. Counter pulsation and VENTRICULAR ASSIST DEVICES(VAD)
3. Minimally Invasive Cardiac Surgery(MICS)
4. Perfusion for Non cardiac Procedures
  - Liver transplant
  - Isolated Limb Perfusion
6. Recent advances in Perfusion Techniques

### **PEDIATRIC PERFUSION**

#### **1. Preparation for CPB:**

**Equipment Preparation of the  
Patient for CPB**

#### **2. Blood Flow, ECC component and circuit**

**selection Cannulation**

#### **3. Priming**

Conduct of

Bypass

CO<sub>2</sub> management & Choice of Acid Base management Fluid Management and Drug  
management during CPB Myocardial Protection

#### **4. ECMO for Neonates, Infants and Children –**

Components Circulatory assist devices for Infants and  
children

## Blood Conservation Techniques

### 1. Preparation for CPB:

Equipment Preparation of the Patient for CPB

2. Blood Flow, ECC component and circuitselection Cannulation

3. Priming

Conduct of

Bypass

CO2 management & Choice of Acid Base management

FluidManagement and Drug management during CPB

MyocardialProtection

ECMO for Neonates, Infants and Children – Recent Advances in Cardiac Perfusion

Technology IABP and ECMO Medico legal Considerations and Record Keeping

### **Reference Books:**

1. Gravlee Cardiopulmonary Bypass: Principles and Practice
2. Robert Bojar Manual of Perioperative Care in Adult Cardiac Surgery
3. Hensley martin A Practical Approach to Cardiac Anesthesia
4. Principles and PracticeCardiac Surgery In Adults – by LawrenceCohn
5. Pediatric Cardiac Surgery – by Constantine Mauroudi - 4thedition.

<b>UAH17CE1020</b>	<b>FUNDAMENTALS OF BIOSTATISTICS</b>
	TotalContactPeriods–4
	Total credits -2
	Course Designed by–Department of Community Medicine
<b>OBJECTIVES</b>	The course will offer basic knowledge about Biostatistics and to correctly apply a variety of statistical procedures and tests according to objective of study

### **UNIT I: Introducing the Basics**

Introduction, Graphical representation of data, Data collection, Diagrammatic and Graphical Presentation of data, Types of data, limitations.

### **UNIT II: Measures of Central Tendency & Dispersion**

Measures of Central Tendency; Mean, Median, Mode, Geometric mean, Harmonic mean for raw data. Measures of dispersion; Quartile deviation, Mean Deviation - Standard Deviation - Coefficient of variation- Range

### **UNIT III: Probability**

Introduction to Probability, Theorems of probability; Bayer's Theorem, Probability Distributions; Discrete & Continuous distributions, Binomial Distribution, Poisson Distribution, Normal Distribution.

### **UNIT IV: Correlation & Regression Analysis**

Correlation Analysis, Types of correlation; Rank Correlation Coefficient. Regression analysis, Types of Regression, Assumptions; Comparison to Correlation.

### **UNIT V: Hypothesis Testing**

Introduction; Types of sampling, Hypothesis testing; Type of errors, Parametric & Non-parametric tests; Mann Whitney's U test, Chi-square, t-tests, ANOVA.

## REFERENCES

1. Don. Mc Neil - Epidemiological Research Methods - Oxford University Press, London.
2. Biostatistics –Principle & Practice – McGraw Hill Education.
3. <http://www.ats.ucla.edu/stat/>
4. <http://www.statsoft.com/textbook/basic-statistics/>

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to understand and apply the Biostatistics.					
CO2	The student will be able to use the software independently for the data analysis.					
CO3	The student will be able determine the correct procedures to use in a given situation					
CO4	The student will be able to interpret the results of hypothesis tests					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
COs\Pos	A	b	c	d	e	f
1	S		M		s	
2				s		M
3	M		S			
4	S			S		M
Category	Management					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

<b>UAH17CE1021</b>	<b>COMMUNICATION SKILLS FOR HEALTH CARE PROFESSIONALS</b>
	TotalContactPeriods-5
	Total credits -2
	Course Designed by-Department of Community Medicine
<b>OBJECTIVES</b>	This course deals with essential functional English aspects of the of communication skills essential for the health care professionals.

### **UNIT: I APPLIED GRAMMAR**

Identifying common errors in sentences, Transformation of sentences, Usage of either ...or..., Neither... nor..., So... that..., Such... that..., Not only... but also..., unless...

### **UNIT: II VOCABULARY**

Abbreviations used in healthcare, Medical idioms & Phrases

### **UNIT: III WRITING**

Letter writing, Curriculum Vitae writing, covering letter, Creative writing – invite, posters, Essay writing, summary writing, note taking, report writing.

### **UNIT: IV SPOKEN COMMUNICATION**

Telephone etiquette, Importance of Stress, Intonation and rhythm, speaking; describing simple process, Filling a form etc., - Asking and answering questions; Debate/Oral Reporting

### **UNIT: V LISTENING AND READING SKILLS:**

Listening and reading comprehension exercises.

#### **Textbook Recommended:**

1. Effective English Communication by Krishna Mohan and Meenakshi Raman, Tata McGraw – Hill Publishing Company Limited, New Delhi.
2. English for Colleges and Competitive Exams by Dr. R. Dyvadatham, Emerald Publishers.

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to express better.					
CO2	The student will be able to get knowledge about MOA, adverse effects					
CO3	The student will Grow personally and professionally					
CO4	The student will Develop confidence in every field					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>
<b>1</b>	S		M		s	
<b>2</b>				s		M
<b>3</b>	M		S		S	
<b>4</b>	S			S		M
Category	Basic Medical Science					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

	<b>BIOMEDICAL ETHICS</b>
<b>UAH17CE1022</b>	TotalContactPeriods-3
	Total credits -2
	Course Designed by-Department of Community Medicine
<b>OBJECTIVES</b>	To provide basic skills in: A) Approaching ethical issues. B) Analysis and statement of issues. C) Understanding the relevant ethical principles invoked..

### **Introduction to Bioethics**

Bioethical issues related to Healthcare & Medicine 5

2Anatomy - Cadaver ethics, Human dignity, PNDT, Disposal of cadaver, Genetic Counseling 7

Physiology - Animal ethics, Health policy privacy 7

Biochemistry & Pathology - Prudence of investigation confidentiality, Patients bill of rights,

Disposal of investigative material, Integrity, Blood transfusion 5

Pharmacology - Rational drug prescribing, Clinical trials, Risk minimization, Animal ethics

Microbiology - Hand wash, Drug resistance minimization, Prudence of investigation confidentiality, Sterilization procedure, Bio safety and bio hazard 5

### **Medicolegal aspects of medical records**

#### **Introduction to Intellectual Property:**

Concept of Intellectual Property Kinds of Intellectual Property

Patents, Copyrights Designs, Trademarks, Geographical Indication, Infringement of IPR, Its protection and

Remedies Licensing and its types

**REFERENCE BOOKS**

1. Contemporary issues in bioethics – Beauchamp & Walters (B&W ) 4th edition.
2. Classic philosophical questions by Glouck (8th Edition)
3. Case book series and booklets by UNESCO Bioethics Core curriculum 2008
4. Encyclopedia of Bioethics 5 vol set, (2003) ISBN-10: 0028657748
5. Intellectual property rights- Ganguli-Tat McGrawhill. (2001) ISBN-10: 0074638602,
6. Intellectual Property Right- Wattal- Oxford Publications House.(1997) ISBN:0195905024.

<b>COURSEOUTCOMES</b>						
CO1	The students will be able to: Recognize what constitutes an ethical concern in health care					
CO2	The student will be able to understand the clinical evaluations of Disease Condition					
CO3	The student will be able to Understand better the complexity and multi-dimensionality of medical ethical concerns and uniqueness of each problem.					
CO4	The student will get the knowledge of plagiarism in their innovations which can be questioned legally					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>d</b>	<b>E</b>	<b>f</b>
<b>1</b>	S		M		S	S
<b>2</b>				s		
<b>3</b>			S			
<b>4</b>	S		M			M
Category	Basic Medical Science					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

<b>UAH17CE1023</b>	<b>FUNDAMENTALS OF HUMAN GENETICS</b>
	Total Contact Periods– 4
	Total credits -2
	Course Designed by–Department of Genetics
<b>OBJECTIVES</b>	To Comprehend the Chromosomal basis of inheritance

### **I -Introduction to cellular components**

Structure and morphology of various types of cells - Biochemical composition - Cellular organelles -Composition and components of nucleus - Chromosomes - Cell division and Mechanics of cell division and regulation.

### **II - Structure and functions of nucleic acids**

Functions, Structure and characteristics of nucleic acids - Types of mutations -Genetic variations and polymorphisms

### **III - Chromosomal basis of inheritance**

Chromosome behavior and inheritance pattern in man - Single gene Mendelian disorders: autosomal dominant, recessive, sex linked dominant and recessive - Polygenic and mitochondrial inheritance.

### **III - Origin and detection of genetic disorders**

Mutation - Non-disjunction - Chromosomal abnormalities and clinical phenotypes of common genetic syndromes (Down's syndrome, Patua's syndrome, Edward syndrome, Turner syndrome and Klinefelter's syndrome, Cri-du-caht syndrome)- Karyotyping, Neural tube defects, Carcinogenesis.

### **IV–Biochemical basis for the inborn errors of metabolism**

General characteristics of inborn errors of metabolism – Incidence - etiology - Folic acid metabolism - triple markers - New born screening, prevention and management. False positive and false negative -Ethical principles of Genetic counseling for prenatal diagnosis - Fetal rights – Regulation and prevention of misuse act 1994.

## Reference books

1. A guide to genetic counseling, 2nd edition, D.L. Baker, J.L. Schuette and W.R. Uhlmann, Wiley –Leiss Publications 2002.
2. Emery Elements of Medical Genetics, 9th edition, Robert F. Mueller & Ian D. young, Churchill Livingstone, 1995.
3. Medical Genetics, 3rd edition, Lynn B. Jorde, John C. Carey, Michael J. Bamshad, & Raymond L. White, Mosby, 2003.

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to Be able to describe the chromosomal basis of inheritance and how alterations in chromosome number or structure.					
CO2	The student will be able to understand of the differences and similarities between diagnostic, predictive and carrier genetic testing.					
CO3	The student will be able to know detailed information of Chromosome behavior and inheritance pattern in man					
CO4	The student will be to understand the phenotype and genotype .					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>d</b>	<b>E</b>	<b>f</b>
<b>1</b>	S		M		S	
<b>2</b>				s		M
<b>3</b>			M			
<b>4</b>	S			S		S
Category	Basic Medical Science					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

<b>UAH17CE2024</b>	<b>PRINCIPLES AND APPLICATION OF CLINICAL GENETICS</b>
	Total Contact Periods– 6
	Total credits -2
	Course Designed by–Department of Nephrology
<b>OBJECTIVES</b>	To develop awareness about Genetic testing, Genetic counseling, Philosophy and Ethos of Genetic services

**I -Principle and components of genetic testing Lay out of genetic laboratories -** Genetic testing, Genetic counseling, Philosophy and Ethos of Genetic services, Types of testing- Cytogenetic testing- Molecular cytogenetic testing- DNA testing.

**II - Cytogenetic testing Indications,** Type of sample, Sampling and transport conditions, Karyotyping - chromosome identification, merits and demerits of conventional cytogenetic testing

**III - Molecular Cytogenetic testing**

Indications, Type of sample, Sampling and transport conditions - Fluorescence in-situ hybridization, fluorescence signal enumeration, merits and demerits of FISH.

**IV - DNA testing**

Organization of human genome, Structure and function of genetic material, Polymerases chainreaction - Types, principles and testing, Sequencing.

**V - Practical:**

Case studies

**Reference books**

1. Practical Genetic counseling, Peter S. Harper, 6th edition, Holder Headline Group 2004.
2. Medical Genetics, 3rd edition, Lynn B. Jorde, John C. Carey, Michael J. Bamshad, & Raymond L. White, Mosby, 2006.
3. Genetics in Medicine, Thompson & Thompson, 6th edition, Elsevier 2004.
4. Practical Genetic counseling, Peter S. Harper, 6th edition, Holder Headline Group 2004.

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to become familiar with and practice genetic tests.					
CO2	The student will be able to provide better patient care					
CO3	The student will be able to know detailed information about Genetic Counselling					
CO4	The student will be to know about Genetic testing.					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>
<b>1</b>	S		M		s	
<b>2</b>				s		M
<b>3</b>			M			
<b>4</b>	S				S	M
Category	Basic Medical Science					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

<b>UAH17CE2025</b>	<b>CLINICAL EXAMINATION OF THE HUMAN VISUAL SYSTEM</b>
	Total Contact Periods-5
	Total credits -2
	Course Designed by-Department of Ophthalmology
<b>OBJECTIVES</b>	The core objective of this course is to gain in depth knowledge on the structural and physiological functions of the various parts of the eye and the different examination procedures for the ocular structures.

### **: I - History Taking**

Importance of history taking, Demographic data and its importance, Chief presenting symptoms, History of present illness, History of past illness, Family History, Common ocular symptoms and their causes – defective vision, watering eyes, discharge, redness, pain, asthenopia and other symptoms

### **II - Visual Acuity measurement**

Distance visual acuity-charts, methods and measurements; Near visual acuity –charts, methods and measurements; contrast sensitivity testing; colour vision testing

### **III - External Examination**

Examination of head posture, examination of forehead, examination of eye brows, examination of eyelids, examination of Lacrimal apparatus, examination of eyeball on the whole, examination of the cornea, conjunctiva sclera and anterior chamber, eye movements, muscle balance and squint evaluation

### **IV - Anterior segment Evaluation**

Slit lamp examination of the eyelids, cornea, conjunctiva, anterior chamber depth, iris, and lens  
Intraocular pressure measurements using non contact tonometer

### **V - Posterior segment Evaluation**

Introduction and importance of posterior segment evaluation- direct and indirect ophthalmoscopy

**REFERENCE BOOKS:**

1. Comprehensive Ophthalmology – A K Khurana, 5th edition, New Age International Publishers,

2012.

2. Clinical Ophthalmology – Jack J Kanski, 7th edition, Butterworths, 2012

1. Borish's Clinical Refraction - William J. Benjamin, Irvin M. Borish, Butterworth-Heinemann, 2006

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to have the skill to perform basic ophthalmic examination					
CO2	The student will be able to understand concept of theory and clinical evaluation of disease conditions gain an in- depth knowledge on disease outline and clinical evaluation of patients					
CO3	The student will be able to depth knowledge on the functions of the visual system					
CO4	The student will have the skill to perform basic ophthalmic examination					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>D</b>	<b>e</b>	<b>f</b>
<b>1</b>	S		M		s	
<b>2</b>				S		M
<b>3</b>	M		S			
<b>4</b>	M			C		M
Category	Basic Medical Science					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

<b>UAH17CE2026</b>	<b>PERSONALITY DEVELOPMENT AND STRESS MANAGEMENT</b>
	Total Contact Periods– 4
	Total credits -2
	Course Designed by–Department of HR
<b>OBJECTIVES</b>	<ul style="list-style-type: none"> <li>To Explain the effect of personality, attitudes, perceptions and attributions on Health stress, coping and relaxation.</li> </ul>

### **Unit 1**

Introduction to Personality Development, Different Stages of Development, Types of personalities, personality perspectives and theories

### **Unit 2**

How needs impact personality, Maslow’s hierarchy of need, Basic Personality Traits; Values, Beliefs, Interactions, Experiences, Environmental influences, the big five dimensions.

### **Unit 3**

Stress; causes, effect and types, Stress resistant personalities, Relaxation; training aspects importance and Body works.

### **Unit 4**

Health stress and coping, Understanding and communicating our health needs, Behavioral and psychological correlates of illness.

### **Unit 5**

Soft skill; need and importance, Personality development and soft skills. Effective communication, listening, speaking, writing, interpretation part of soft skills and personality

### **Learning Outcome:**

By successfully completing this course, students will be able to Describe how a personality develops.

- Define the stages of personality development.
- Define personality types.
- Describe basic personality traits.
- Personality and stress.
- Health stress, coping and relaxation.
- Soft skills and personality.

**Text Books:**

1. Hurlock (1976). Personality development. Tata McGraw Hill.
2. Baron R A, Psychology 5th edition, Pearsons publication.
3. Abraham A, General Psychology, Tata McGraw hill Education private limited.

**Reference Books:**

1. Lazarus J Stress Relief and Relaxation Techniques, Viva Book Private limited.
2. Shelly E. Taylor, Health psychology, 7th edition, TATA McGrawHil, New Delhi.

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to Define the stages of personality development.					
CO2	<ul style="list-style-type: none"> <li>• The student will be able to Describe basic personality traits.</li> </ul>					
CO3	The student will be able to Describe how a personality develops-Personality and stress.					
CO4	The student will be able to Develop the Soft skills and personality.					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>D</b>	<b>e</b>	<b>f</b>
<b>1</b>	S		M		s	
<b>2</b>				S		M
<b>3</b>	M		S			
<b>4</b>	S			S		M
Category	Management					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

<b>UAH17CE2027</b>	<b>FIRST AID MANAGEMENT &amp; SPLINTING TECHNIQUES</b>
	TotalContactPeriods-6
	Total credits -2
	Course Designed by-Department of Medicine
<b>OBJECTIVES</b>	Students will gain additional skills in interventional procedures and Differentiate between emergency situation and other use.

### **Unit-I BACKGROUND INFORMATION**

- The importance of first Aid
- First aid supplies
- First aid and the law
- Prevention practices

### **Unit-II ACTION AT AN EMERGENCY**

- Recognizing Emergencies
- Deciding to act
- Seeking medical care
- Disease transmission
- Rescuer reactions

### **Unit -III BLEEDING AND WOUNDS**

- External bleeding
- Wound infection
- Amputations
- Impaled objects
- Wound that require medical care
- Internal Bleeding
- Dressing and Bandages

### **Unit-IV BONE, JOINT AND MUSCLE INJURIES**

- Bone injuries
- Splinting
- Joint injuries
- RICE injuries
- Muscle injuries
- Splints – Introduction, Types, Uses, Splinting guidelines, Slings, Procedure,Complications

### **UNIT-V RESCUING AND MOVING INJURIES**

- Water rescue
- Ice rescue
- Electrical Emergency Rescue Hazardous materials incidents

- Motor Vehicle crashes
- Fires
- Confined spaces
- Triage – what to do with multiple victims
- Moving victims

**Text books:**

1. First Aid CPR and AED standard (sixth edition)
2. First aid book-St Johns Ambulance services
3. Text book of Orthopaedics – Natarajan
4. Text book of Orthopaedics – John Ebenezer Reference books: First Aid and Management of Minor Injuries by Jon Dallimore First Aid and Beyond by Dan Wolfe - Smashwords , 2014 International Trauma Life Support Provider Manual Essentials Orthopaedics Mark D Mille

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to Differentiate between emergency situation and other use.					
CO2	The student will be able to know about the basics of concepts of disease & outlines of clinical evaluation.					
CO3	The student will be able to List management, assessment, and care steps for upper extremity and lower extremity fractures.					
CO4	The student will be to know Splinting techniques of lower extremities – Thomas splint, sam splint, etc					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>D</b>	<b>e</b>	<b>f</b>
<b>1</b>	S		M		s	
<b>2</b>				S		M
<b>3</b>	M		S			
<b>4</b>	S			S		M
Category	Basic Medical Science					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

	<b>ESSENTIALS OF MEDICAL TRANSCRIPTION</b>
<b>UAH17CE3028</b>	Total Contact Periods– 7
	Total credits -2
	Course Designed by–Department of MRD
<b>OBJECTIVES</b>	Provide Hands on training on English Language and listening comprehension and provide foundation to learn medical terminology & learn laboratory report

### Unit 1

The Medical Transcriptionist's career including Ethical & Legal Responsibilities Introduction to Medical transcription, Job Opportunities, Transcription Skills, Medical records, Certification for Medical Transcriptionists, Ethical and Legal responsibilities

### Unit 2

Equipments in Transcription Equipment, Computer Systems, Ergonomics, Dictation Equipments, Hand and Foot control Dictation, Transcription Preparation

### Unit 3

Transcription Guidelines Punctuations, Proof reading notations, Formats and styles, SOAP for Chart notes; Discharge Summary

### Unit 4 PRACTICAL:

1. Equipments for Medical Transcription, 2. Typing for the beginners, 3. Vocabulary, 4. Proof reading Notations, 5. Formats and styles in document preparation, 6. Preparation of chart notes, 7. Listening Comprehension, 8. Transcription check off sheet **References Book 1. Medical Key boarding, Typing, and Transcribing Techniques and procedures 4th Edition, March**

**Otis Diehl, Marilyn Takahashi Fordney, W.B. Saunders Company**

2. The AAMT Book of Style for Medical Transcription, Claudia J. Tessier

3. CD's available for:

a. Stedman's Electronic Medical Dictionary 4.0

b. American Drug Index 2003

**Text Books:**

1. Medical Key boarding, Typing, and Transcribing Techniques and procedures 4th Edition, March

Otis Diehl, Marilyn Takahashi Fordney, W.B. Saunders Company

2. The AAMT Book of Style for Medical Transcription, Claudia J. Tessie

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to Demonstrate their basic skills in the knowledge of Vocabulary, Medical terminology					
CO2	The student will be able to Demonstrate their basic skills in the preparation of chart notes.					
CO3	The student will be able to Demonstrate skills in listening comprehension					
CO4	<ul style="list-style-type: none"> <li>The student will be be able to identify accurate format for medical document preparation</li> </ul>					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>d</b>	<b>E</b>	<b>f</b>
<b>1</b>	S		M		S	
<b>2</b>				s		M
<b>3</b>	M		S			
<b>4</b>	S			S		M
Category	Medical Records					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

<b>UAH17CE3029</b>	<b>COMMUNICATION AND SOFT SKILL</b>
	Total Contact Periods– 7
	Total credits -2
	Course Designed by–Department of Human Resources
<b>OBJECTIVES</b>	This course is designed to equip the students with essential soft skills needed for workplace and improve personality.

### **LEARNING OUTCOME:**

This course is designed to help the students to

- Foster healthy attitude.
- Develop effective inter and intra personal skills to be an effective team worker.
- Communicate effectively in both academic and professional setup

### **UNIT: I ASPECTS OF COMMUNICATION**

Importance of communication, Process, Barriers, Non verbal Communication

### **UNIT: II SPEAKING**

How to Open and Close conversations, Introductions and Address System, Expressing Courtesy, Giving Compliments and replying to Compliments, Presentation Skills, Telephonic conversation and telephone etiquette

### **UNIT – III PRESCRIBED READING**

Tom Sawyer by Mark Twain, Bacon’s Essays: - Of Goodness and goodness of nature

### **UNIT – IV WRITING**

Letter writing - Letter of Complaints, Inviting and Declining an invitation, Writing Memos and Emails, Grammar, Spelling & Punctuation, Use of Dictionary & Thesaurus.

### **UNIT – V SOFT SKILLS**

Active Listening Skills, Assertive Skills, Negotiation and Persuasive Skills, Interview Skills

**Text Book:**

Developing Communication Skills by Krishna Mohan and Meera Banerji, II edition, Macmillan.

**Reference Books:**

1. Communication Skills for Engineers and Scientists by Sangeeta Sharma and Binod Mishra, PHI Learning Private Limited, New Delhi.
2. English and soft skills by S.P. Dhanavel, Orient Black Swan
3. Effective English Communication by Krishna Mohan and Meenakshi Raman, Tata McGraw – Hill Publishing Company Limited.
4. Technical Communication – Principles and Practice, by Meenakshi Raman and Sangeetha Sharma, II edition, Oxford University Press.
5. Developing Communication Skills by Krishna Mohan and Meera Banerji, II edition, Macmillan.
6. The Complete Guide to Functional Writing in English by M. Sarada, Sterling Publishers (P) Ltd., New Delhi.
7. Speaking Naturally: Communication Skills in American English by Bruce Tillitt and Mary Newton Bruder, Cambridge University

<b>COURSE OUTCOMES</b>	
CO1	The student will be able to Foster healthy attitude
CO2	The student will be able to develop effective inter and intra personal skills to be an effective team worker
CO3	The student will be able to Develop effective inter and intra personal skills to be an effective team worker
CO4	The student will be able to Communicate effectively in both academic and professional setup

**MAPPINGBETWEENCOURSEOUTCOMES&PROGRAMMEOUTCOMES**

<b>COs\Pos</b>	<b>a</b>	<b>B</b>	<b>C</b>	<b>d</b>	<b>e</b>	<b>F</b>
<b>1</b>	S		M		s	
<b>2</b>				s		M
<b>3</b>	M		S			
<b>4</b>	s			S		M
Category	Basic Medical Science					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					

<b>UAH17CE3030</b>	<b>PROFESSIONAL SKILLS DEVELOPMENT</b>
	Total Contact Periods– 6
	Total credits -2
	Course Designed by–Department of Human Resources
<b>OBJECTIVES</b>	To Advance the students' intellectual curiosity, competency and skills in preparation for employment

### **1. Communication Skills**

Importance of Communication skills in Public health; Communication process; Methods of communication; Types of communication: Verbal and Non-verbal; Impediments to effective communication; Feedback

### **2. Oral Presentation Skills:**

Preparation and planning; Structure; Audio-visual aids; Creating interest and establishing a relationship with the audience; Body language; Voice and pronunciation; Review

### **3. Writing skills:**

Writing a scientific paper; Writing a proposal; Structure of an article; References and literature review; Peer-review process-Publication bias; International guidelines for publication in journals; Professional Ethics

### **4. Leadership in Public health:**

Leadership styles and trait; Motivation skills; Interpersonal communication skills; Problem solving skills; Decision making skills; Management skills; Communication Skills

### **5. Manuscript writing**

Writing introduction, objectives, methodologies, major finding, discussion, conclusion and recommendation  
**6. Seminar presentations** Use of computers present data and information on recent topics

### **Text Books:**

1. Professional Writing Skills, A self paced training programme by Janis Fisher Chan and Diane Lutovich. Advanced Communication Designs Inc, 2003. San Anselmo, CA. ISBN 0963745549

2. Speaking Your Mind: Oral Presentation and Seminar Skills By Rebecca Stott, Tory Young, Cordelia Bryan Contributor Rebecca Stott, Tory Young, Cordelia Bryan Published by Longman, 2001 ISBN 0582382432, 9780582382435

3. Public Health Leadership: Putting Principles into Practice Louis Rowitz, PhD. Jones and Bartlett Publishers, 2003. ISBN-13: 9780763725013 ISBN-10: 07637250

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to Develop good written and oral communication abilities					
CO2	The student will be able to Develop an understanding of team building and leadership skills.					
CO3	The student will be able to Develop knowledge regarding capacities needed to work independently within diverse work environments					
CO4	The student will be able to know how to maintain Records and Reports and demonstrate the procedure.					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>D</b>	<b>e</b>	<b>f</b>
<b>1</b>	S		M		s	
<b>2</b>				S		M
<b>3</b>	M		S			
<b>4</b>	S			S		M
Category	Basic Medical Science					
Approval	46 <sup>th</sup> Meeting Of Academic Council held in Aug, 2017					

	<b>LIBRARY SCIENCE AND E-RESOURCES</b>
<b>UAH17CE3031</b>	Total Contact Periods– 6
	Total credits -2
	Course Designed by–Department of Library science
<b>OBJECTIVES</b>	To gain knowledge about Documentary Sources of Information and Library Automation

### **Unit 1 BASIC CONCEPTS AND INFORMATION SERVICES**

Meaning of Library – Types of Library — Library layout - Functions of Library – need for Library – Meaning of ISBN and ISSN – Collection management - Library Classification system - Five laws of Library Science – Inter Library Loan (ILL), Communication theories and models. Barriers to communication. Levels of communications – Intrapersonal, interpersonal and mass communication. Information services – literature search Methods of Dissemination of information Current Awareness Service (CAS), Selective Dissemination of Information (SDI), Document delivery service, Alert services, and Internet services.

### **Unit 2 INFORMATION SOURCES**

Documentary Sources of Information, Print, and Non-print including Electronic, Human and Institutional sources: Nature, types, characteristics and utility. Internet as a source of Information. Primary sources of information – Journal, conference volume, patents, research reports, thesis and their electronic format – Secondary sources of information - Bibliography, Encyclopedia Dictionary, Yearbook , Directory, Geographical Source, Textbook, Index and Abstracts.

### **Unit 3 LIBRARY AUTOMATION**

Definition need, Purpose, advantages. Planning for Library automation. Automation of Library operations - Acquisitions, Cataloguing, OPAC, Circulation and Serials control. Evaluation of Library automation systems - Application of Barcode and RFID Technology for Library Functions. Basic concepts: Bibliography, bibliographic coupling, Impact factor.

### **Unit 4 ELECTRONIC INFORMATION SOURCES**

Electronic Information resources: Meaning and definition, Growth and development, Types. Journals, e-Books, e-Theses, e-newspapers, Blogs, Wikis. Free databases and fee based bibliographical and full text databases, subject related websites, Institutional repositories, Open Archives and digital Libraries. - Resource Sharing and Networks: Consortia- Importance and objectives. Study of Information networks and Digital Library Consortia. Types of computer networks: Local Area Networks – Concept, Topologies - Bus, Star, Mesh, Tree, and Ring). Wide Area Networks and Metropolitan Area Networks- Concepts, Circuit switching and Packet switching. Difference between LAN and WAN. Wireless Networks –Mobile telephones.

### **Unit 5 DIGITAL LIBRARIES**

Digital Libraries: Concepts and issues. Understanding digital Libraries Content creation – Electronic documents, files and file formats. Study of different file formats. Studying PDF in detail- features of PDF. Digitization- scanning, Digital Preservation, Conservation and Archival Management – Problems and prospects. Open Access Movement and Institutional repositories.

### **TEXTBOOKS**

1. Ranganathan, S.R The five Laws of Library Science UBS Publishers, 1988.
2. Ranganathan, S.R. Library Manual SaradaRanganathan endowment for Library Science, 1989.
3. Ranganathan, S.R. Cataloguing Practice SaradaRanganathan endowment for Library Science 1990

<b>COURSEOUTCOMES</b>						
CO1	The student will be able to analyze and understand the query					
CO2	The student will be able to Identify the sources of information					
CO3	The student will be able to Find out the information					
CO4	The student will be able to know how to maintain Records and Reports and demonstrate the procedure.					
<b>MAPPINGBETWEENCOURSEOUTCOMES&amp;PROGRAMMEOUTCOMES</b>						
<b>COs\Pos</b>	<b>A</b>	<b>B</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>F</b>
<b>1</b>	S		M		s	
<b>2</b>				s		M
<b>3</b>	M		S			
<b>4</b>	S			S		M
Category	Library Science					
Approval	46 <sup>th</sup> Meeting of Academic Council held in Aug, 2017					