Courses of Master in Biochemistry

1- Biochemistry - 1st semester

2- Special Topics – 2nd semester

3- Clinical Biochemistry 2nd semester

4- Hormones 2nd semester

5- Biostatics 2nd semester

6- Molecular Biology 2nd semester

1- Biochemistry

Amino acids(general properties, metabolism of amino acids) - Peptides and proteins(general properties) – myoglobin – hemoglobin – Enzymes(general properties -kinetics- mechanism of action- regulation) - Bioenergetics and biologic oxidation - carbohydrate metabolism - lipid metabolism - Integration of metabolism - Nucleic acid structure and function - nucleotides- metabolism of purine and pyrimidine nucleotides.

2- Special Topics

Vitamins and Minerals- Nutrition – Digestion – Absorption - Feed/Fast Cycle - Diabetes Mellitus- Obesity – Glycoproteins- The Extracellular Matrix - Muscle and the Cytoskeleton - Hemostasis and Thrombosis - Metabolism of Xenobiotics – cancer- cancer genes and growth factors.

3- Clinical Biochemistry

Water- sodium - potassium - hydrogen ion homeostasis - calcium-phosphate - magnesium- kidneys - liver - gastrointestinal tract - disorders of carbohydrate metabolism - plasma proteins and enzymes - lipids - lipoproteins and cardiovascular disease - bone inherited metabolic disease - metabolic aspects of malignant disease - endocrine control – Dynamic function tests .

4- Hormones

Mechanisms of hormone action - Hormone receptors - Feedback mechanisms - Endocrine and neurotransmission - Disorders of endocrine system - Thyroid gland - Calcium and bone metabolism - Adrenal glands (medulla and cortex) - The endocrine brain and pituitary gland - Pancreatic hormones - Endocrinology of the female - Endocrinology of the male – Puberty - Thymus gland - Geriatric endocrinology - Gastrointestinal hormones - Prostaglandin - Endocrine hypertension - Hormones and cancer.

5- Biostatics

Tests of hypotheses (Testing the difference between two population means and two population proportions) - Analysis of variance (One and Two ways) – Chi- Square tests and applications – Non–Parametric statistics (Wilcoxon and Kruskal – Wallis tests - Multiple linear regression.

6- Molecular Biology

DNA (structure - DNA fingerprinting - Telomerase and cancer - Human genome project) – RNA (Structure – Types - Transcription - Heat shock genes - Modification - Protein synthesis (Translation - Modification - Molecular chaperones) - Regulation of gene expression in : Gene amplification - Aberrant gene rearrangements – Transcriptional - Post- transcriptional and translational regulation - SLE disease and RNA processing - Molecular analysis of some inherited disorders: Thalassaemias - Sickle cell anaemia - antitrypsin deficiency - Haemophilias A and B - Gene probes - Restriction fragment length polymorphisms (RFLP’s) and diagnosis of human disease -Genetic screening: Neonatal (PKU, CHT , galactosaemia and biotinidase deficiency) - Prenatal screening - Aminoacidopathies and mental retardation - Gene therapy.