

COURSE PLAN
APPLIED BIOCHEMISTRY
B.Sc. (H) NURSING 1ST YEAR- 2nd Semester

PLACEMENT: B.Sc. (H) Nursing 1st year -Second Semester

HOURS OF INSTRUCTIONS: 40 HOURS (2 Credits)

Course Description:

This course is designed to assist the students to acquire knowledge of the normal biochemical composition and functioning of human body, its alterations in disease conditions and to apply this knowledge in the practice of nursing.

General Objectives:

On the completion of the course, the students will be able to:

- Describe the metabolism of carbohydrates and its alterations.
- Explain the metabolism of lipids and its alterations.
- Explain the metabolism of proteins and amino acids and its alterations.
- Explain clinical enzymology in various disease conditions.
- Explain acid base balance, imbalance and its clinical significance.
- Describe the metabolism of hemoglobin and its clinical significance.
- Explain different function, tests and interpret the findings.
- Illustrate the immunochemistry.

Course Content

UNIT	LEARNING OBJECTIVES	CONTENT	TIME (HOURS)	TEACHING LEARNING ACTIVITIES	METHOD OF EVALUATION
I	Describe the metabolism of carbohydrates and its alterations	<p>Carbohydrates</p> <ul style="list-style-type: none"> ❖ Digestion and absorption of carbohydrates. ❖ Metabolism of carbohydrates and related disorders. ❖ Regulation of blood glucose ❖ Diabetes Mellitus – type 1 and 2, symptoms, complications and management in brief. ❖ Investigations of Diabetes Mellitus <ul style="list-style-type: none"> ○ OGTT – indications, procedure, interpretation and types of GTT curve ○ Mini GTT, extended GTT, GCT, IV GTT ○ HbA1c (only definition) ❖ Hypoglycemia- Definition and causes. 	8 Hour	Lecture cum discussion Explain using charts and slides Demonstration of laboratory tests	Essay Short answers Very Short answer

II	Explain the metabolism of lipids and its alterations	<p>Lipids</p> <ul style="list-style-type: none"> ❖ Fatty acids – Definition and classification ❖ Definition & Clinical significance of MUFA & PUFA, Essential fatty acids, Trans fatty acids ❖ Digestion, absorption and metabolism of lipids and related disorders. ❖ Compounds formed from Cholesterol ❖ Ketone bodies ❖ Lipoproteins – types and functions ❖ Lipid Profile ❖ Atherosclerosis 	8 Hour	<p>Lecture cum discussion</p> <p>Explain using Charts and slides</p> <p>Demonstration of Laboratory tests</p>	<p>Essay</p> <p>Short answers</p> <p>Very Short answer</p>
III	Explain the metabolism of proteins and amino acids and its alterations.	<p>Proteins</p> <ul style="list-style-type: none"> ❖ Classification of amino acids based on nutrition, metabolic rate with examples ❖ Digestion, absorption and metabolism of proteins and related disorders. ❖ Biologically important compounds synthesized from various amino acids 	9 Hour	<p>Lecture cum discussion</p> <p>Explain using Charts and slides</p>	<p>Short answers</p> <p>Very Short answer</p>

		<ul style="list-style-type: none"> ❖ In born errors of amino acid metabolism- only aromatic amino acids ❖ Plasma proteins – types, functions and normal values. ❖ Causes of Proteinuria, hypoproteinemia, hyper – gamma globinemia ❖ Principle of electrophoresis, normal & abnormal electrophoretic patterns 			
IV	Explain clinical enzymology in various disease conditions.	<p>Clinical Enzymology</p> <ul style="list-style-type: none"> ❖ Isoenzymes – definition & properties ❖ Enzymes of diagnostic importance in: <ul style="list-style-type: none"> ○ Liver Diseases- ALT, AST, ALP ○ Myocardial infarction- CK, Cardiac troponins, AST, LDH ○ Muscle diseases – CK, aldolase ○ Bone diseases- ALP ○ Prostate Cancer – PSA, ACP 	4 Hour	Lecture cum discussion Explain using Charts and slides	Essay Short answers Very Short answer

V	Explain acid base balance, imbalance and its clinical significance	Acid Base Maintenance <ul style="list-style-type: none"> ❖ PH – definition, normal value ❖ Regulation of blood PH- blood buffer, respiratory & renal ❖ ABG – normal values ❖ Acid base disorders- types, definition and causes 	3 Hour	Lecture cum discussion Explain using Charts and slides	Short answers Very Short answer
VI	Describe the metabolism of hemoglobin and its clinical significance	Heme Catabolism <ul style="list-style-type: none"> ❖ Heme degradation pathway ❖ Jaundice – type, causes, urine & blood investigations 	2 Hour	Lecture cum discussion	Short answers Very Short answer
VII	Explain different function, tests and interpret the findings	Organ function tests <ul style="list-style-type: none"> ❖ Renal ❖ Liver ❖ Thyroid 	3 Hour	Lecture cum discussion Explain using Charts and slides	Short answers Very Short answer
VIII	Illustrate the immunochemistry	Immunochemistry <ul style="list-style-type: none"> ❖ Structure & functions of immunoglobulin ❖ Investigations & interpretation - ELISA 	3 Hour	Lecture cum discussion Explain using Charts and slides	Short answers Very Short answer

