



SILVER OAK UNIVERSITY

Silver Oak College of Nursing

Bachelor of Science (Nursing)

Course Name: Applied Biochemistry and Applied Nutrition and Dietetics

Course Code: 1060323105

Semester: 2nd

Prerequisite:

Prerequisites for studying applied biochemistry typically include a strong foundation in basic sciences and chemistry, Understanding of basic chemical principles, atomic structure, bonding, chemical reactions, and students should have basic knowledge of nutrition principles, dietary guidelines, nutrient requirements, and the role of nutrition in health and disease prevention.

Course Objective:

1. To assist the students to acquire knowledge of the normal biochemical composition and functioning of human body
2. To acquire basic knowledge of Nutrition and Dietetics and to apply this knowledge in the practice of nursing.
3. To develop an understanding of the role of nutrition in public health and the prevention of chronic diseases.
4. To gain practical experience in conducting research, analyzing data, and communicating findings in a clear and effective manner

Teaching Scheme:

Teaching Scheme				
L	T	P	Contact Hours	Credit
5	0	0	5	5

Content:

SECTION- A APPLIED BIOCHEMISTRY

Unit No.	Contents	Teaching Hours	Weightage %
1	Carbohydrates Digestion, absorption and metabolism of carbohydrates and related disorders Regulation of blood glucose Diabetes Mellitus - type 1 & type 2, symptoms, complications & management in brief Investigations of Diabetes Mellitus GTT: Indications, Procedure, Interpretation and types of GTT curve Mini GTT, extended GTT, GCT, IV GTT HbA1c (Only definition) Hypoglycemia-definition & causes	8	20

2	<p>Lipids Fatty acids: Definition, classification & alterations Definition & Clinical significance of MUFA & PUFA, Essential fatty acids, Trans fatty acids Digestion, absorption & metabolism of lipids & related disorders Compounds formed from cholesterol Ketone bodies (name, types & significance only) Lipoproteins – types & functions (metabolism not required) Lipid profile Atherosclerosis (in brief)</p>	8	20
3	<p>Proteins Classification of amino acids based on nutrition, metabolic rate with examples Digestion, absorption & metabolism of protein & related disorders Biologically important compounds synthesized from various amino acids (only names) In born errors of amino acid metabolism – only aromatic amino acids (in brief) Plasma protein – types, function & normal values Causes of proteinuria, hypoproteinemia, hyper-gamma globinemia Principle of electrophoresis, normal & abnormal electrophoretic patterns (in brief)</p>	9	23
4	<p>Clinical Enzymology Isoenzymes – Definition & properties Enzymes of diagnostic importance in Liver Diseases-ALT, AST, ALP, GGT Myocardial infarction-CK, cardiac troponins, AST, LDH Muscle diseases-CK, Aldolase Bone diseases-ALP Prostate cancer-PSA, ACP</p>	4	10
5	<p>Acid base maintenance pH - definition, normal value Regulation of blood pH – blood buffer, respiratory & renal ABG – normal values Acid base disorders –types, definition & causes</p>	3	7
6	<p>Heme catabolism Heme degradation pathway Jaundice – type, causes, urine & blood investigations (van den berg test)</p>	2	5
7	<p>Organ function tests (biochemical parameters & normal values only) Renal Liver Thyroid</p>	3	7

8	Immunochemistry Structure & functions of immunoglobulin Investigations & interpretation-ELISA	3	8
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Course Outcome:

Sr. No.	CO statement	Unit No
CO - 1	Describe the metabolism of Carbohydrate, Lipids, Proteins and its alteration.	1,2,3
CO - 2	Explain clinical enzymology in various disease conditions.	4
CO - 3	Discuss regarding acid base balance, imbalance and metabolism of hemoglobin and its clinical significance	5,6
CO - 4	Understand the knowledge regarding different function test and interpret the findings	7
CO - 5	Illustrate immunochemistry	8

Teaching & Learning Methodology: -

1. Lecture cum discussion
2. Power point presentation
3. Supervise clinical practice
4. Demonstration of Laboratory test

CO-PO-PSO Matrix

Co. No.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO-1	2	2	1	-	-	2	1	2	2	-	1	2
CO-2	2	1	1	-	-	1	1	2	2	2	1	2
CO-3	2	1	1	-	-	2	2	2	1	2	2	2
CO-4	1	2	2	-	-	2	2	2	2	2	2	2
CO-5	1	2	2	-	-	2	2	3	2	1	2	1

SECTION- B APPLIED NUTRITION AND DIETETICS

Unit No.	Contents	Teaching Hours	Weightage %
1	Introduction to Nutrition Concepts: Definition of Nutrition & Health Malnutrition- Under Nutrition & Over Nutrition	2	4

	<p>Role of Nutrition in maintaining health Factors affecting food and nutrition Nutrients Classification: Macro & Micronutrients Organic & Inorganic Energy Yielding & Non-Energy Yielding Food Classification-Food groups Origin</p>		
2	<p>Carbohydrates Composition -starches, sugar and cellulose Recommended Daily Allowance (RDA) Dietary sources Functions(RDA) of carbohydrates Explain BMR and factors affecting BMR Energy Unit of energy-Kcal Basal Metabolic Rate (BMR) Factors affecting BMR</p>	3	7
3	<p>Proteins Composition Eight essential amino acids Functions Dietary sources Protein requirements-RDA</p>	3	7
4	<p>Fats Classification-saturated & unsaturated Calorie value Functions Dietary sources of fats and fatty acids Fat requirements-RDA</p>	2	4
5	<p>Vitamins Classification-fat soluble & water soluble Fat soluble-Vitamins A, D, E, and K Water soluble-Thiamine (vitamin B1), Riboflavin (vitamin B2), Nicotinic acid, Pyridoxine (vitamin B6), Pantothenic acid, Folic acid, Vitamin B12, Ascorbic acid (vitamin C) Functions, Dietary Sources & Requirements-RDA of every vitamin</p>	3	7
6	<p>Minerals Classification- Major minerals (Calcium, phosphorus, sodium, potassium, and magnesium) and Trace elements Functions Dietary Sources Requirements- RDA</p>	3	7
7	<p>Balanced diet Definition, principles, steps Food guides – Basic Four Food Groups</p>	7	15

	<p>RDA – Definition, limitations, uses</p> <p>Food Exchange System</p> <p>Calculation of nutritive value of foods</p> <p>Dietary fibre</p> <p>Nutrition across life cycle</p> <p>Meal planning/Menu planning – Definition, principles, steps</p> <p>Infant and Young Child Feeding (IYCF) guidelines- breast feeding, infant foods</p> <p>Diet plan for different age groups- Children, adolescents and elderly</p> <p>Diet in pregnancy- nutritional requirements and balanced diet plan</p> <p>Anemia in pregnancy-diagnosis, diet for anemic pregnant women, iron & folic acid supplementation and counseling</p> <p>Nutrition in lactation-nutritional requirements, diet for lactating mothers, complementary feeding/weaning</p>		
8	<p>Nutritional deficiency disorders</p> <p>Protein energy malnutrition- magnitude of the problem, causes, classification, signs & symptoms, Severe acute malnutrition (SAM), management & prevention, nurses' role</p> <p>Childhood obesity-Signs & symptoms, assessment, management & prevention and nurses' role</p> <p>Vitamin deficiency disorders- vitamin A, B, C & D deficiency disorders: causes, signs & symptoms, management & prevention and nurses' role</p> <p>Mineral deficiency diseases-iron, iodine and calcium deficiencies: causes, signs & symptoms, management & prevention and nurses' role</p>	6	13
9	<p>Therapeutic diets</p> <p>Definition, Objectives, Principles</p> <p>Modifications – Consistency, Nutrients, Feeding techniques.</p> <p>Diet in Diseases – Obesity, Diabetes Mellitus, CVD, Underweight, Renal diseases, Hepatic disorders Constipation, Diarrhea, Pre and Post operative period</p>	4	9
10	<p>Cookery rules and preservation of nutrients</p> <p>Cooking – Methods, Advantages and Disadvantages</p> <p>Preservation of nutrients</p> <p>Measures to prevent loss of nutrients during preparation</p> <p>Safe food handling and Storage of foods</p> <p>Food preservation</p> <p>Food additives and food adulteration</p> <p>Prevention of Food Adulteration Act (PFA)</p>	3	7
11	<p>Nutrition assessment and nutrition education</p> <p>Objectives of nutritional assessment</p> <p>Methods of assessment-clinical examination, anthropometry, laboratory & biochemical assessment, assessment of dietary intake including Food frequency questionnaire (FFQ) method</p>	4	9

	Nutrition education-purposes, principles and methods		
12	National Nutritional Programmes and role of nurse National nutritional policy National nutritional programmes: Vitamin A Supplementation, Anemia Mukd Bharat Programme, Integrated Child Development Services (ICDS), Mid-day Meal Scheme (MDMS), National Iodine Deficiency Disorders Control Programme (NIDDCP), Weekly Iron Folic Acid Supplementation (WIFS) and others as introduced Role of nurse in every programme	3	7
13	Food safety Definition, Food safety considerations &measures Food safety regulatory measures in India-Relevant Acts Five keys to safer food Food storage, food handling and cooking General principles of food storage of food items (ex. Milk ,meat) Role of food handlers in food borne diseases Essential steps in safe cooking practices	2	4

Course Outcome:

Sr. No.	CO statement	Unit No
CO - 1	Explain nutrition and its relationship to health.	1
CO - 2	Describe the classification, function, sources ,RDA of Carbohydrate, Energy Protein, Fat, Vitamins and Minerals	2,3,4,5,6
CO - 3	Describe the balance diet for different age groups, pregnancy and lactation	7
CO - 4	Describe nutritional deficiency disorders ,identify its nurses role in assessment, management and prevention and plan therapeutic diets in various diseases	8,9
CO - 5	Discuss the rules and preservation of nutrients and methods of nutritional assessment.	10,11
CO- 6	Describe the nutritional problems and nutritional programs in India and also importance of food hygiene and food safety	12,13

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CO-1	2	2	1	-	-	2	1	2	2	-	1	2
CO-2	2	1	1	-	-	1	1	2	2	2	1	2
CO-3	2	1	1	-	-	2	2	2	1	2	2	2
CO-4	1	2	2	-	-	2	2	2	2	2	2	2
CO-5	1	2	2	-	-	2	2	3	2	1	2	1
CO-6	2	2	2	-	-	3	3	2	2	3	2	3