

Subject No. 4
NUTRITION AND BIOCHEMISTRY

Total Hours: 90

Theory Hours: 70

Practical Hours: 20

SECTION 'A' - NUTRITION

Total Hours: 60

Theory: 40 hrs.

Lab. hours: 20

AIM:

- The Course is designed to assist the students to understand the normal requirement of nutrition and also help the students to understand variations required during various physiological and pathological conditions, and to learn various methods of food preparation, perseverations and maintenance of food hygiene.

OBJECTIVES:

At the end of the course the students will be able to:

- Understand the concept of nutrition & health.
- Understand different types of nutrients, their importance, sources, functions and problems due to deficiency.
- Plan balanced diet for individuals and groups and menu efficiently.
- Explain methods of effective cooking and food preservation.
- Apply the principles of food preparation in the practical field effectively.

COURSE CONTENT:

Unit I – Introduction:

- Term Nutrition. History. Concepts. Role of nutrition in maintaining health. Nutritional Problems in India. National nutritional policy. **Factors affecting food and nutrition: socio-economic, cultural, tradition, production, system of distribution life style and food habits etc.** Role of food and its medicinal value. Classification of foods, food standards. Elements of nutrition: macro and micro calorie, BMR. Macro nutrients- Protein, fats and carbohydrates.

Unit II – Carbohydrates:

- Classification. Caloric value. Recommended daily allowances of food. Dietary sources & Functions. Digestion, absorption and storage, metabolism of carbohydrates. Malnutrition: Deficiencies and Over consumption. **Macro nutrients- carbohydrates. Kerb cycle**

Unit III – Fats:

- Classification & Caloric value. Recommended daily allowances of food. Dietary sources & Functions. Digestion, absorption and storage, metabolism. Malnutrition: Deficiencies and Over consumption. **Macro nutrients-, fats**

Unit IV – Proteins:

- Classification & Caloric value. Recommended daily allowances of food. Dietary sources & Functions. Digestion, absorption and storage, metabolism. Malnutrition: Deficiencies and Over consumption. **Macro nutrients- Protein**

Unit V – Energy:

- Unit of Energy- Kcal. Energy requirements of different categories of people. Measurements of energy. Body Mass Index (BMI) and basic metabolism. Basal Metabolic Rate (BMR) – determination and factors affecting. **Calorific value of CHO, Fats and Proteins**

Unit VI – Vitamins:

- Classification. Recommended daily allowances of food. Dietary sources & Function. Digestion, **absorption and storage and excretion. Deficiencies. Hypervitaminosis.**

Unit VII – Minerals:

- Classification. Recommended daily allowances of food. Dietary sources& Function. **Absorption, synthesis, metabolism storage and excretion. Deficiencies. Over consumption and toxicity.**

Unit VIII - Water & electrolytes:

- **Water:** Daily requirement, **regulation of water metabolism, distribution of body water.**
- **Electrolytes:** Types, sources, composition of body fluids.
- Maintenance of fluid & electrolyte balance. **Over hydration, dehydration and water intoxication. Electrolyte imbalances.**

Unit IX - Cookery rules and preservation of nutrients:

- Principles, methods of cooking and serving. Preservation of nutrients. Safe Food handling-toxicity. Storage of food. Food preservation, food additives and its principles. Prevention of food adulteration Act (PFA). Food standards. Preparation of simple beverages and different types of food. **Food adulteration and Fortification of food**

Unit X - Balanced diet:

- Elements. Food groups. Recommended Daily Allowance of food. Nutritive value of foods. Calculation of balanced diet of different categories of people. Planning menu. Budgeting of food. Introduction to therapeutic diet: Naturopathy – Diet. **Food additives, Hospital diet Development of professional skills in preparation of therapeutic diet**

Unit XI - Role of nurse in nutritional programmes:

- National programmes related to nutrition. Vitamin A deficiency programme. National iodine deficiency disorders (IDD) programme. Mid – day meal programme. Integrated child development scheme (ICDS) **National and International agencies working towards food / nutrition.** NIPCCD, CARE, FAO, MIN, CETRI (Central food technology and research institute) etc .Assessment of nutritional status. Nutrition education and role of nurse.

SECTION 'A' -NUTRITION

Unit No. & total hours	Objectives	Contents with distributed hours					
		Must know		Desirable to know		Nice to know	
I Introduction (4 hours)	At the end of unit students are able to Knowledge: Understand and describe classification of foods, food standards, and elements of nutrition, calories and BMR. Explain factors affecting food and nutrition and nutritional problems in India. Attitude: Appreciates the impact of socio economic cultural and traditional values on a food and nutrition.	<ul style="list-style-type: none"> • Role of nutrition in maintaining health. • Nutritional Problems in India. • Classification of foods & Food standards. • Elements of nutrition: macro and micro* Calorie, BMR. (2 hours) 		Factors affecting food and nutrition: socio-economic, cultural, Tradition, production, system of distribution, life style and food habits etc. (1 hrs)		History, Concepts Role of food and its medicinal value. National nutritional policy (1 hrs)	
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1- Explain role of nutrition in maintaining health.	3	3	2	1	3	2	1
C2- Describe the nutritional problems in India.	3	3	2	2	3	2	3
C3- Define food, classify foods and explain food standards.	2	2	2	1	2	2	1
C4- Explain elements of nutrition.	2	2	1	1	2	2	1
C5- Explain Basal Metabolic Rate.	3	3	2	1	3	2	3
C6- Explain the factors affecting food and nutrition	3	3	3	2	2	2	3
C7- Describe the role of food and its medicinal value.	3	3	2	3	2	2	2
C8- Explain National nutritional policy.	2	3	2	1	3	3	3
II Carbohydrate (02 hours)	At the end of unit students are able to Knowledge Understand and describe classification, functions and digestion of carbohydrates. Enlist the effects of deficiencies and over consumption.	<ul style="list-style-type: none"> • Classification & Caloric value. • Recommended daily allowances of food. • Dietary sources. & Function. • Malnutrition: Deficiencies and Over consumption. (1 hrs) 		<ul style="list-style-type: none"> • Digestion, absorption and storage, Metabolism of carbohydrates. . Macro nutrients- carbohydrates • Kerb cycle (1 hrs) 			
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1-Define and classify caloric value	3	3	2	1	2	3	2

C2-Explain recommended daily allowances of food	3	3	2	1	3	2	1
C3-Enlist the dietary sources and function	3	3	2	1	2	1	2
C4-Explain malnutrition: Deficiencies and Over consumption.	3	3	2	2	3	3	3
C5-Describe the digestion, absorption and storage of carbohydrate	3	3	2	1	2	2	2
C6- Explain the metabolism of carbohydrates	3	3	2	1	2	2	2
C7-Explain Kerb cycle.	2	2	2	1	2	2	2
III Fats (02 hours)	At the end of unit students are able to Knowledge: Understand and describe classification and requirements of fats. Understand and explain dilatory sources, functions and digestion of fats. Attitude: Use this knowledge in nursing practice.		<ul style="list-style-type: none"> • Classification & Caloric value • Recommended daily allowances of food. • Dietary sources & Function. • Malnutrition: Deficiencies and Over consumption.(1 hrs) 		<ul style="list-style-type: none"> • Digestion, absorption and storage, metabolism. • Macro nutrients- fats (1 hrs) 		
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1-Define and classify caloric value	3	3	2	1	2	3	2
C2-Explain recommended daily allowances of food	3	3	2	1	3	2	1
C3-Enlist the dietary sources and function	3	3	2	1	2	1	2
C4-Explain malnutrition: Deficiencies and Over consumption.	3	3	2	2	3	3	3
C5-Describe the digestion, absorption and storage of fats	3	3	2	1	2	2	2
C6- Explain the metabolism of fats	3	3	2	1	2	2	2
IV Proteins (02 hours)	At the end of unit students are able to Knowledge: Understand and describe classification and requirements of proteins. Attitude: Use this knowledge in nursing practice.		<ul style="list-style-type: none"> • Classification& Caloric value. • Recommended daily allowances of food. • Dietary sources& Function • Malnutrition: Deficiencies and Over consumption.(1 hrs) 		<ul style="list-style-type: none"> • Digestion, absorption and storage, metabolism • Macro nutrients- Protein (1 hrs) 		
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1-Define and classify caloric value	3	3	2	1	2	3	2
C2-Explain recommended daily allowances of	3	3	2	1	3	2	1

food							
C3-Enlist the dietary sources and function	3	3	2	1	2	1	2
C4-Explain malnutrition: Deficiencies and Over consumption.	3	3	2	2	3	3	3
C5-Describe the digestion, absorption and storage of proteins	3	3	2	1	2	2	2
C6- Explain the metabolism of proteins	3	3	2	1	2	2	2
V Energy (03 hours)	At the end of unit students are able to Knowledge: understand and explain the caloric requirement of various age groups. Skill : Able to calculate calories of food		<ul style="list-style-type: none"> • Unit of Energy- Kcal • Energy requirements of different categories of people. (1 hour) 		Measurements of energy. Body Mass Index (BMI) and basic metabolism Basal Metabolic Rate (BMR) – determination and factors affecting.(1hours)		Calorific value of CHO, Fats and Proteins. (1hours)
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1- Define unit of energy	3	3	2	1	2	2	1
C2-Explain the energy requirement of different categories of people.	3	2	3	1	2	2	3
C3- Explain the measurements of energy	2	2	2	1	2	2	1
C4- Explain body mass index	3	3	2	1	3	2	3
C5-Describe Basal Metabolic Rate	3	3	2	1	3	2	3
C6-Determine the factors affecting Basal Metabolic Rate	2	2	2	1	2	2	2
C7- Explain calorific value of CHO, Fats and Proteins.	3	3	2	1	2	3	2
VI Vitamins (04 hours)	At the end of unit students are able to Knowledge: Classify the vitamins. Enlist the importance of vitamins. Skill: Identify the vitamins deficiency.		<ul style="list-style-type: none"> • Classification. • Recommended daily allowances of food. • Dietary sources & Function. • Digestion (3 hours) 		<ul style="list-style-type: none"> • Absorption and storage and excretion. Deficiencies. • Hypervitaminosis (1hours) 		
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1-Define and classify caloric value	3	3	2	1	2	3	2

C2-Explain recommended daily allowances of food	3	3	2	1	3	2	1
C3-Enlist the dietary sources and function	3	3	2	1	2	1	2
C4-Explain malnutrition: Deficiencies and Over consumption.	3	3	2	2	3	3	3
C5-Describe the digestion, absorption and storage of vitamins	3	3	2	1	2	2	2
C6- Explain the metabolism of vitamins	3	3	2	1	2	2	2
C7- Explain hypervitaminosis	2	2	2	1	2	2	2
VII Minerals (04 hours)	At the end of unit students are able to Knowledge: Understand and describe the importance of minerals. Skill : Identify the mineral deficiency		<ul style="list-style-type: none"> • Classification • Recommended daily allowances of food. • Dietary sources& Function (3 hours) 		<ul style="list-style-type: none"> • Absorption, synthesis, metabolism storage and excretion. • Deficiencies • Over consumption and toxicity. (1 hr) 		
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1-Define and classify caloric value	3	3	2	1	2	3	2
C2-Explain recommended daily allowances of food	3	3	2	1	3	2	1
C3-Enlist the dietary sources and function	3	3	2	1	2	1	2
C4-Explain malnutrition: Deficiencies and Over consumption.	3	3	2	2	3	3	3
C5-Describe the digestion, absorption and storage of minerals	3	3	2	1	2	2	2
C6- Explain the metabolism of minerals	3	3	2	1	2	2	2
VIII Water (03 hours)	At the end of unit students are able to Knowledge: Understand and explain importance of water and electrolytes. Attitude: Use this knowledge in nursing practice.		<ul style="list-style-type: none"> • Water: Daily requirement, regulation of water. • Electrolytes Types, sources, composition of body fluids. Maintenance of fluid & electrolyte balance (2 hours) 		<ul style="list-style-type: none"> • Metabolism, distribution of body water • Over hydration, dehydration and water intoxication, Electrolyte imbalances (1 hour) 		
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1-Explain the daily requirement and	3	3	2	1	2	2	3

regulation of water.							
C2- Define, explain, classify, and describe the types, sources, composition of body fluids.	3	3	2	1	2	2	3
C3- Explain maintenance of fluid & electrolyte balance	3	3	1	2	1	1	2
C4-Explain metabolism of water	3	3	2	1	2	2	2
C5- Explain the distribution of water in the body	3	3	2	1	2	2	2
C6-Explain Over hydration, dehydration and water intoxication	3	3	2	1	2	2	2
C7- Describe electrolyte imbalances	3	3	1	2	1	1	2
IX (05 hours)	At the end of unit students are able to Knowledge: Understand and describe rules of food keeping and preservation of nutrients. Skill: Cook foods stuffs following rules. Attitude: Appreciate the importance of rules to be followed while cooking.		<ul style="list-style-type: none"> Principles, methods of cooking and serving. Preservation of nutrients Safe Food handling-toxicity Storage of food Food standards Preparation of simple beverages and different types of food (3 hours) 		<ul style="list-style-type: none"> Food preservation, food additives and its principles Food fortification (1 hours) 		<ul style="list-style-type: none"> Prevention of food adulteration Act (PFA) Food adulteration (1 hours)
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1-Define cooking, explain the principles, methods of cooking	3	3	3	2	3	3	3
C2-Explain the methods of preservation of nutrients	3	3	3	2	3	3	3
C3- Explain safe food handling	3	3	3	2	3	3	3
C4-Explain the storage of food	3	3	3	2	3	3	3
C5-Describe food standards	3	3	3	2	3	3	3
C6-Illustrate the preparation of simple beverages and different types of food	3	3	3	2	3	3	3
C7-Explain the Food preservation, food additives and its principles	3	3	3	2	3	3	3
C8- Explain food fortification	3	3	3	2	3	3	3
C9- Explain food adulteration act	3	3	3	2	3	3	3

X (07 hours)	At the end of unit students are able to Knowledge: Understand and describe importance of balance diet. Skill : Prepare balance diet Attitude: Educate client.	<ul style="list-style-type: none"> • Elements,& Food groups • Recommended Daily Allowance of food & Nutritive value of foods (2 hrs) • Calculation of balanced diet of different categories of people (2 hr) • Planning menu (1 hour) • Budgeting of food (1hour) 				<ul style="list-style-type: none"> • Introduction to therapeutic diet : Naturopathy • Hospital diet • Development of professional skills in preparation of therapeutic diet (1 hour) 			
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7		
C1- Explain elements and food group	3	3	2	1	2	2	1		
C2-Explain the Recommended Daily Allowance of food & Nutritive value of foods	3	3	2	1	3	2	1		
C3- Describe the Calculation of balanced diet of different categories of people	3	3	2	1	2	3	3		
C4- Explain Planning menu	3	3	2	1	2	2	1		
C5-Explain Budgeting of food	3	3	2	1	2	2	1		
C6- Explain naturopathy	2	2	2	1	2	2	2		
C7- Describe hospital diet	2	2	2	1	2	2	2		
C8- Development of professional skills in preparation of therapeutic diet	3	3	2	2	3	2	3		
XI (04 hours)	At the end of unit students are able to Knowledge: Enlist National Nutritional Programmes in India and describe nurse's role. Attitude: Contribute in implementation of national nutritional programs.	<ul style="list-style-type: none"> • Assessment of nutritional status Nutrition education and role of nurse. (1 hour) 				<ul style="list-style-type: none"> • National programmes related to nutrition • Vitamin A deficiency programme. • National iodine deficiency disorders programme(IDD) • Mid – day meal programme • Integrated child development scheme (ICDS). (2 hours)		<ul style="list-style-type: none"> • National and International agencies working towards food nutrition. (1hour) NIPC CD, CARE, MIN, FAO, CETRI (Central food technology and research 	

							institute) etc.
Course outcome	Clinician/ Nurse educator	Professional	Communicator	Leader and member of the health care team an system	Lifelong learner	Critical thinker	Researcher
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
C1- Explain Assessment of nutritional status Nutrition education and role of nurse	3	3	2	1	3	2	1
C2- Explain National programmes related to nutrition	3	3	2	2	3	2	3
C3-Describe the National and International agencies working towards food / nutrition	3	3	2	1	3	2	3

LAB HOURS: TOTAL - 20 HOURS

Sr. No	Name of Topic	Recipe		Hours
I	Liquid Diet	Egg Flip	Barley Water	Total 20 Hours Practical Experience
		Whey Water	Orange Juice	
		Mango Juice	Sweet Line Juice	
		Soup		
II	Soft Diet	Custard	Carmel custard	
		Kanji	Jelly	
		Porridge		
III	Semi Solid Diet	Khichadi	Smashed Potatoes	
		Kheer		
IV	Balanced Diet	Planning of Menu	Budgeting of Food	
		Calculation of Nutritive Values	Identification of various food groups	

TEACHING STRATEGY:

Total Teaching Hours: 60

Lectures: 40

Lab Hours: 20

TEACHING METHODS:

- Lecture. Simulated Kitchen. Group Discussion and **Modified Tutorial**

A.V. AIDS:

- Over head Projector, L.C.D, Computer assisted learning, Flip charts, Posters, Black Board.

ASSIGNMENTS: Theory:

Theory:

Sr. No	Assignments	No./Quantity	Marks Per Assignment	Total Marks
1	Assignment Book	One- Preparation of various types of diet	20	40
2	Home assignment	One	20	

- While calculating Internal Assessment –Marks obtained in the assignments of Nutrition and Biochemistry shall be amalgamated as one subject, ‘Nutrition and Biochemistry.

LIST OF RECOMMENDED BOOKS:

- Anderson, Nutrition in nursing
- Anita E.P Clinical dietetics and nutrition
- Corrine H Robinson- Normal and therapeutic nutrition
- Patwardhan V.N., Nutrition in India
- Leena F Cooper., Nutrition in health and disease