

M.Sc. Nutrition and Dietetics (2018-19 Onwards)
Curriculum Framework

Semester	Course Code	Course Title	Hours/Week	Credit	University Examination			Exam Hours
					I	E	T	
I	Core 01	Nutrition Through Life Cycle	5	4	25	75	100	3
	Core 02	Human Nutrition I	4	4	25	75	100	3
	Core 03	Nutritional Biochemistry	5	4	25	75	100	3
	Core 04	Diet in Disease I	4	4	25	75	100	3
	Core 05	Nutrition Management Practical	4	2	40	60	100	4
	Core 06	Diet in Disease I Practical	4	2	40	60	100	4
	Elective 01	Food Science	4	4	25	75	100	4
	Total		30	24	205	495	700	
II	Core 07	Human Nutrition II	4	4	25	75	100	3
	Core 08	Physiological Aspects of Nutrition	4	4	25	75	100	3
	Core 09	Diet in Disease II	4	4	25	75	100	3
	Core 10	Diet in Disease II Practical	4	2	40	60	100	4
	Core 11	Nutritional Biochemistry Practical	4	2	40	60	100	4
	Core 12	Food Analysis Practical	4	2	40	60	100	4
	EDC	Nutritional Management (for other Department Students)	4	4	25	75	100	3
		Human Rights	2	2	25	75	100	3
	Total		30	24	245	565	800	
III	Core 13	Community and Public Health Nutrition	4	4	25	75	100	3
	Core 14	Nutrition in Exercise and Sports	4	4	25	75	100	3
	Core 15	Institutional Food Management	4	4	25	75	100	3
	Core 16	Research Methodology and Statistics	4	4	25	75	100	3
	Core 17	Assessment of Nutritional Status in the Community	5	2	40	60	100	6
	Core 18	Assessment of Food Management in the Organization	5	2	40	60	100	6
	Core 19	Hospital Internship	-	4	40	60	100	6
	Elective 02	Food Processing and Preservation	4	4	25	75	100	3
	Total		30	28	245	555	800	
IV	Core 20	Diet Counselling	4	4	25	75	100	3
	Core 21	Nutraceuticals and Functional Foods	4	4	25	75	100	3
	Core 22	Dissertation and Viva Voce	18	4	25	75	100	6
	Elective 03	Food Safety and Standards	4	4	25	75	100	3
	Total		30	16	115	285	400	

SEMESTER I

Core 01: Nutrition Through Life Cycle

Objectives

This paper will enable the students to

1. Understand the Computation of allowances.
2. Understand the importance of nutrition during life span.

UNIT-I

Nutrition during Pregnancy: Prenatal growth and development, Nutritional requirements, RDA, Weight gain during pregnancy, Relationship between maternal and foetal nutrition, Teenage pregnancy and diet, General gastro intestinal problems, complications of pregnancy.

UNIT-II

Nutrition during Lactation: Physiological process of lactation, Nutritional requirements, RDA, Breast feeding- Colostrum and mature milk. Advantages of breast feeding- Nutritional benefit, hormones and growth, immunological benefits, psychological and economic, environmental benefits, infant and child morbidity. Barriers to breast feeding, Low milk production.

UNIT-III

Nutrition during Infancy: Infant growth and Physiological development, Nutritional requirements for growth, RDA, Artificial feeding. Low birth weight and Preterm baby- Nutritional requirements, feeding the preterm baby, feeding problems. Weaning- Need for weaning, types of supplementary foods, problems in weaning. Nutrition in Preschool children: Growth and development, nutritional requirements, RDA, feeding dental problems and decay. Nutrition related problems of preschool children – Protein energy malnutrition- Types, symptoms, nutritional requirements and treatment.

Unit –IV

Nutrition in School children: Nutritional requirements, RDA, Feeding problems, Packed lunches, Supplementary foods. Nutrition in Adolescents; Growth and development, Nutritional requirements, RDA, Nutritional problems- Obesity, eating disorders, predisposition to osteoporosis, anaemia, under nutrition, pre-menstrual syndrome, mal nutrition due to early marriage.

Unit –V

Nutrition in Adults: Growth and development, Nutritional requirements, RDA. Nutrition in Old age: General physiological changes, Theories on the causes of aging, Nutritional requirements, Nutrition related problems of old age, Degenerative diseases. Alzheimer's disease- Cause, physical effects and nutrition consideration. Guidelines for promoting healthful eating in old age, Exercise in old age.

References:

1. Gordon. M. Wardlaw et.al; Contemporary Nutrition, 2nd edition, Publishing by Mosby, 2004.
2. Srilakshmi. B; Dietetics, 7th edition, New Age International (P) Limited Publishers, 2014.
3. William's; Nix; Basic Nutrition and Diet therapy, 14th edition, Publishing by Mosby, 2013.
4. Mahtab S. Bamji, Prasad Rao, N. Vinodini Reddy; Textbook of Human Nutrition, Second Edition Oxford and IBH Publishing Co. Pvt .Ltd, 2003.
5. Nutrient Requirement and Recommend Dietary Allowances for Indians by Indian council of Medical research, National Institute of nutrition, Hyderabad.
6. Judith E. Brown., Nutrition New, 2nd edition, West / Wadsworth west / Wadsworth, An International Thomson publishing company, 1998.

Core 02: Human Nutrition I

Objectives

1. To understand the structure and functions of macronutrients in human body.
2. To understand the effects of deficiency and excess of macronutrients in human body

UNIT I

Carbohydrates – Introduction, Classification - Basis of degree of polymerization, based on digestive fate of carbohydrates. Functions, Food sources, Requirements Digestion, absorption and metabolic utilization of carbohydrates, Regulation of blood glucose concentration. Glycemic index -Factors affecting GI of foods.

Dietary fibre -Introduction, Types, Properties, RDA and Components of dietary fibre. Role of fibre in human nutrition.

UNIT II

Lipid-Introduction, Classification, Function, Food sources, Requirements, RDA, digestion, absorption, transport and storage. Lipids and gene expression. Dietary fat and coronary heart disease. Fatty acid-Types, Functions, Requirements, food sources and deficiency.

Omega fatty acids – Classification, role in good health, daily values, food sources, fortification of omega fatty acids.

UNIT III

Proteins- Introduction, Classification, Functions, Requirements and RDA, Food sources, Digestion, absorption and metabolic utilization of protein, Quality of proteins.

Amino acid - Types, functions, food sources, requirements, deficiency. Therapeutic applications of specific amino acids. Peptides of physiological significance. Proteins, amino acids and gene expression.

UNIT IV

Energy – Introduction, Units, determination of energy value of food, physiological fuel value, Benedict's Oxy-calorimeter, relation between oxygen required and calorimeter value. Basal Metabolic rate – Introduction, measurement of basal metabolism determination of basal metabolic rate by calculation energy requirement, during work, Thermic effect of food, Total energy requirement – Meaning, Measuring total energy requirement. Factors affecting physical activity, basal metabolic rate and thermic effect of food, Dietary source, RDA.

UNIT IV

Water and electrolytes – Introduction, water, electrolytes and body composition, body water distribution, body electrolyte content: Distribution and exchangeable fractions, Intracellular water and the body cell mass concept, regulation of body water compartments, metabolic links: glucose, water and sodium. Body water compartments in chronic starvation, Impact to acute pathological conditions on the ICW, Body water in acute illness, water and electrolyte metabolism during refeeding, Implications of water and sodium metabolism in nutrition therapy for specific clinical condition.

References

1. Michael. J. Gibney et al; Clinical Nutrition, Blackwell Science, 2005.
2. Shubhangini. A. Joshi; Nutrition and Dietetics III edition, McGraw Hill Education (India) private limited
3. Srilakshmi.B; Nutrition Science, 15th edition, New Age International (P) Limited, Publishers, 2016.
4. Swaminathan. M; Advanced Text-Book on Food and Nutrition, Volume I 2nd edition. The Bangalore Printing and Publishing Co., LTD, Reprint 2015.
5. Sunetra Roday; Food Science and Nutrition, 2nd edition, Oxfore University Prerss, 2013
6. Carol Byrd – Bredbenner; Wardlaw's perspeccctives in Nutrition, 9th edition MCGraw – Hill International Edition 2013

Core 03: Nutritional Biochemistry

Objectives

1. To develop students' knowledge, understanding and skills in nutritional biochemistry and the role of metabolism in human.

UNIT 1

Water & electrolytes: Fluid compartments, distribution, water Intake & output, water balance, Composition of electrolytes in fluid compartments, buffer system, acid base balance-blood & kidney, imbalance disorders-dehydration & oedema. Enzymes – Classification and Role of Enzymes.

UNIT 2

Carbohydrate metabolism: Classification, Review of digestion and absorption. oxidation of glucose – glycolysis, oxidative decarboxylation, citric acid cycle. Pentose phosphate pathway. Glycogen-Glycogenesis, Glycogenolysis. Gluconeogenesis. Inborn errors of metabolism. Glycogen storage diseases.

UNIT 3

Protein metabolism: Classification of protein, Review of digestion and absorption. Deamination, transamination, trans-deamination, decarboxylation, deamidation, Urea cycle, inborn errors of amino acid metabolism.

UNIT 4

Nucleic acid metabolism: Classification, Biological oxidation, Electron transport chain, nucleic acid metabolism, structure of DNA & RNA, genetic code, DNA replication, bio synthesis of protein.

UNIT 5

Lipid metabolism: Classification, Oxidation of fatty acid- α , β , & ω . Bio synthesis of fatty acid & TGL, Cholesterol synthesis & synthesis of bile acids & bile pigments, ketosis, ketone bodies, acidosis & fatty liver.

References

1. Deb. A.C., Fundamental of Biochemistry, New Centruy Book Agency (P) Ltd, Reprint 2004.
2. Ambika Shanmugam, Fundamentals of biochemistry for Medical students, Karthik Pprinters, 7thedition, 1992.
3. U.Sathyanarayana and U.Chakrabani, Biochemistry, Third Edition, Uppala- Author Publishers, 2007.
4. Mahtab. S.Bamji, Kamala Krishnaswamy and G.N.V Brahmam, Text Book of Human Nutrition, Oxford and IBH Publishing Company, Third Edition.2009

Core 04: Diet in Disease I

Objectives

1. To understand the etiology, physiological, metabolic anomalies, nutritional management of acute and chronic disorders / diseases

UNIT-I

Principles of clinical nutrition – Introduction, the spectrum of nutritional problems and management pathways. Perspectives on the future. Drug and Diet Interaction, Diet therapy and types of therapeutic diets, Role of dietitian and Indian Dietetic Association. The influence of drugs on the nutritional status of patients. Special Feeding Method: Intravenous feeding, tube feeding, gastrostomy, jejunostomy – Meaning, objectives, Technique, Nutrients and Diet.

UNIT-II

Nutritional therapy during energy imbalance: Over nutrition and under nutrition - Introduction, etiology, clinical assessment, treatment approaches – general principles, lifestyle changes and nutritional management.

Eating disorders: Anorexia nervosa, bulimia nervosa, binge eating disorder – History, etiology, clinical features, epidemiology and nutritional management.

UNIT-III

Adverse reaction to foods; Introduction, food intolerance, food allergy, types of food allergy, patterns of food allergic responses, diagnostic criteria for food allergy, specific food allergies, multiple food allergy, scientific background: The basic mechanisms of immune response to dietary antigen.

Infection and fevers – defense mechanisms in the body, Role of Nutrition in Infections, effects of infection on body mechanisms, effects of infection on nutrition, definition of fever, nutritional modification in infection and fever.

Unit –IV

Metabolic disorder: Diabetes Mellitus – Introduction, types, pathophysiology of insulin resistance, symptoms, biochemical tests, complications, hypoglycemic drugs, dietary management, patient education, the diabetic association of India.

Unit –V

Gastro intestinal tract disorders: Dyspepsia, peptic ulcer, diarrhoea, constipation, inflammatory bowel disease – definition, epidemiology, pathogenesis, clinical features and diagnosis, dietary management.

Diseases of Liver - Hepatitis, (A, B, and C), Cirrhosis - Causes, symptoms, dietary management and Prevention.

References

1. Michael. J. Gibney et al; Clinical Nutrition Blackwell Science, 2005.
2. Shubhangini. A. Joshi; Nutrition and Dietetics, 3rd edition, McGraw Hill Education (India) Private Limited.
3. Srilakshmi . B; Nutrition Science, 15th edition, New Age International (p) Limited, publishers, 2016.
4. Swaminathan. M; Advanced Text-Book on Food and Nutrition, Volume I and 11 2nd Edition, The Bangalore printing and publishing co., LTD, Reprint 2015.
5. Sunetra Roday; Food Science and Nutrition, 2nd edition, Oxford University press, 2013.
6. Carol Byrd – Bredbenner; Wardlaw's perspectives in Nutrition, 9th edition McGraw – Hill International Edition, 2013.

Core 05: Nutrition Management Practical

Objectives

1. To impart learning on menu planning strategy, nutrient intake analysis and analysis on sufficiency of food intake.

Exercises

1. Weights and Measures
2. Food Exchange list
3. Menu plan for pregnancy
4. Menu plan for lactation
5. Menu plan for infants
6. Menu plan for preschool children
7. Menu plan for school children
8. Menu plan for adolescent boys and girls
9. Menu plan for an adult
10. Menu plan for Nutritional Deficiencies
 - a. Protein Calorie Malnutrition
 - b. Anaemia
 - c. Iodine Deficiency
 - d. Flourosis
 - e. Vitamin A Deficiency
 - f. Scurvy
 - g. Angular Stomatitis
 - h. Calcium Deficiency

The above mentioned exercises will provide learning on planning a menu, collection of basic information of a person, portion size, amount of nutrients required, food plan, meal distribution, menu plan, nutrient calculation and matching with requirement, preparation and display of a meal.

References

1. Amy E. Galena, Msh Rd. 2013. Eat to Your Good Health: Exchange Lists and Meal Planning for Eating Disorders. USA
2. Peggy S. Stanfield, Peggy Stanfield, Y. H. Hui. 2010. Nutrition and Diet Therapy: Self-Instructional Approaches. 5th edition. Jones and Bartlett publishers. Canada.
3. B Srilakshmi. 2014. Dietetics. New Age International publishers.

Core 06: Diet in Disease I Practical

Objectives

1. To impart learning on dietary management for various diseases.

Exercises

- I. Standardization of common food preparations.
- II. Planning, preparation and calculation of nutritive value for the following diets (SOAP Format)
 1. Normal diet.
 2. Liquid diet
 3. Soft diet
 4. Enteral formulas
 5. High fibre and low caloric diet
 6. Diet for Energy imbalance
 7. Diet for Diabetes Mellitus
 8. Diet for Gastrointestinal diseases
 9. Diet for Liver diseases
 10. Diet for Infections and fevers.

References

1. Amy E. Galena, Msh Rd. 2013. Eat to Your Good Health: Exchange Lists and Meal Planning for Eating Disorders. USA
2. Peggy S. Stanfield, Peggy Stanfield, Y. H. Hui. 2010. Nutrition and Diet Therapy: Self-Instructional Approaches. 5th edition. Jones and Bartlett publishers. Canada.
3. B Srilakshmi. 2014. Dietetics. New Age International publishers.

Elective 01: Food Science

Objectives

1. To understand the composition and nutritive value of cereals, pulses, milk and milk products, vegetables, fruits, fats, oils, nuts and spices.

UNIT –I

Definition of Food Science, Food, **Colloids** – Types and Properties; Sols – Properties; Gels – Properties and factors influencing gel formation; Emulsion – Types, formation, properties and stability of emulsions; Foams – formation, Stability and anti-foaming agents.

Cereals: General structure, composition, Nutritive value of rice, wheat, maize, oats and jowar. Cereal cookery: Cereal protein- Gluten formation and factors affecting; Cereal starch, effect of moist heat – Gelatinisation, factors affecting gelatinisation Changes in cooked starches- Gel formation, Retrogradation and syneresis; Effect of dry heat- Dextrinisation; Effect of cooking on nutritive value.

Millets: Composition, Nutritive value and uses of pearl millet, finger millet, proso millet.

UNIT-II

Pluses: Composition and nutritive value, Digestibility of pulses and factors affecting the digestibility of pulse proteins, Toxic constituents in pulses and their elimination; commonly used pulses. Pulse cookery: Effect of cooking, Factors affecting cooking quality.

Milk and Milk products: Composition of milk, Nutritive value of milk and milk products, Physical and chemical properties of milk, Types of milk available in the market.

UNIT-III

Meat: Classes of meat, structure, composition and nutritive value; post-mortem changes in meat, ageing, tenderising, curing; cuts and grades of meat. Meat cookery: Factors affecting cooking quality, changes in meat on cooking, tenderness and juiciness of meat.

Fish: Classification, composition and nutritive value, selection. Fish cookery: Principles and methods.

Poultry: Classification, composition and nutritive value, processing and cooking.

Egg: Structure, composition and nutritive value, quality of egg – factors determining and evaluation. Egg cookery: Effect of cooking on nutritive value, effect of heat on egg protein, factors affecting coagulation of egg proteins, effect of other ingredients on egg proteins.

UNIT-IV

Vegetables: Classification, composition and nutritive value, pigments, organic acids, enzymes, flavour compounds, bitter compounds, selection of vegetables. Vegetables cookery: Changes during cooking, loss of nutrients during cooking, effect of cooking on pigments.

Fruits: Classification, composition and nutritive value, pigments, cellulose and pectic substances, changes during cooking, flavour constituents, polyphenols, bitterness, post-harvest changes and ripening. Browning: Types and prevention.

UNIT-V

Nuts and Oilseeds: Classification, composition and nutritive value, toxins present in nuts, role in cookery. Fats and oils: Nutritional importance of fats and oils, functions of oils and fats in foods, flavour changes – Rancidity – types and prevention, reversion.

Sugar: Sources, properties, types, forms, liquid sweeteners, reactions of sugar Crystallisation: Factors affecting, role of sugar in cookery, stages of sugar cookery, crystalline and non-crystalline candies.

Spices: Classification, general functions, commonly used spices and herbs, role of spices in cookery.

Aromatics – Composition and uses.

Beverages: Classification and points to be considered while preparing beverages.

References:

1. Srilakshmi. B; Food Science, 6th edition New Age International (p) Limited Publishers 2015.
2. Shakunthala manay N; Shadakshara swamy. M; Foods Facts and Principles, Third edition, New Age International (p) Limited Publishers, 2014.
3. Lillian Hoagland meyer, Food chemistry, CBS Publishers and distributors, 2004.
4. Arindam Ramaswamy, Elements of Food Science, Oxford book company, 2010.
5. Norman N. Potter, Joseph H. Hotchkiss, and food science, fifth edition, CBS publishers and distributors, 1996.
6. B. Sivasankar, Food Processing and Preservation, PHI Learning Private Limited, 2011.