

NEPBASED

Syllabus

**B.Sc.(Honours)inNutrition
w.e.f.AcademicSession2023-24**



**KaziNazrulUniversity
Asansol,PaschimBardhaman
WestBengal713340**

Introduction:

The Department of Nutrition Science offers Bachelor of Science (B.Sc.) Honours in Nutrition Science. The aim is to train a cadre of professionals who would work as dietitians, nutrition consultants and public health nutritionists. The program follows the new educational policies.

Programme Specific Objectives:

1. Understand the role of food and nutrition for the welfare of the community.
2. Foundation for career opportunities in areas of personal and Public Health Nutrition.
3. Enable to pursue higher education and research in academic and research institutions.
4. Promote entrepreneurs in the field of food and nutrition.
5. Inculcate the skill based knowledge on food industry.

Semester: I

Course Name: FUNDAMENTALS OF NUTRITION SCIENCE I

Course Code: BSCNUTMJ101

Course Type: Major (Theoretical)	Course Details: MJC-1		L-T-P: 4-1-0		
Credit: 5	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		...	30	70

Course Learning Outcomes:

After the completion of course, the students will have ability to

1. To help students recognize that food is a basic requirement of life.
2. Describe basic food preparation techniques.
3. Identify the physical, chemical, and/or microbiological changes in food caused by heat, enzymes, changes in pH, freezing, incorporation of air, and mechanical manipulation.
4. Understand food quality.
5. Learn fundamentals of modifying recipes to meet current nutrition recommendations for fat, cholesterol, fiber, etc. without sacrificing flavor or appearance.
6. Learn to find credible sources of information re. food science and nutrition.

Course Content:**Theory****UNIT 1: Food and Nutrition: Basic Concepts**

- Food, Nutrition, Health, Primary Health Care and Nutritional Status (Definition, Interrelationship in maintaining good health and well-being)
- Food (Functions and Constituents of food – Nutrient and Food Groups: Basic concepts)
- Nutrients (macro & micro, nutraceutical): Functions, Sources, Digestion, Absorption, Utilization and Requirements
- Recommended Dietary allowances and RDA for Indians (ICMR 2010 & 2020) and their uses in planning diets.

- Concept of BMR & SDA.

UNIT 2: Digestive system: A major system of nutrition:

- Basic concept of digestive system, digestive juices and their functions.
- Digestion and absorption of macronutrients.
- Absorption of micronutrients; vitamins, calcium, iron, magnesium, sodium, potassium.
- Common disorders in digestive system; ulcer, diarrhoea, lactose intolerance, constipation; causes, symptoms, and brief dietary management.

UNIT 3: Nutrition through the Life Cycle

- Nutrition during Infancy (0-1 years) and Preschool years (1-6 years): Infancy, preschool period (critical from Growth, development view point, nutrient requirements- Infant and Young \Child Feeding practices, planning balanced diet for infants, preschoolers and special considerations for feeding young children.
- Nutrition during Childhood and Adolescent: Growth, Development, Nutrient needs, meeting nutrient needs through planning balanced diets, packed lunches factors influencing food and nutrient needs during adolescence (peer pressure, body image, media, stress, fasting)
- Nutrition during Adulthood and Old Age: Factors influencing nutritional requirements (age, gender, activity level-sedentary, moderate, heavy) Nutrient needs (RDA) and meeting requirement by planning balanced diets.
- Nutrition during pregnancy and lactation.

UNIT 4: Nutrition awareness & Public Health: Basic Concept:

- Definition of awareness, awareness generation process, knowledge-attitude- practice.
- Public health concept, determinants of public health.
- Nutritional awareness impact on public health.
- Strategies adopted for nutritional awareness generation on public health at rural sectors; child to child strategy, child to parent strategy, women to women strategy.

UNIT 5: Undernutrition management from intrauterine life to adulthood:

- Types of undernutrition, causes of undernutrition at different phases of human life cycle.
- Major Deficiency Disorders: (PEM in the context of underweight, stunting, wasting, SAM; Nutritional Anaemia with special reference to Iron Deficiency Anaemia; Vitamin A deficiency (Xerophthalmia); Iodine Deficiency Disorders; Zinc deficiency: Prevalence, Causes, Consequences and its control.
- Other Nutritional Problems: Vitamin B complex deficiencies, vitamin C deficiency, Vitamin D deficiencies.

References/Suggested Readings

1. Jelliffe DB. Assessment of the Nutritional Status of the Community; World Health Organisation.
2. Sahn DE, Lockwood R, Scrimshaw NS (1988): Methods for the Evaluation of the Impact of Food and Nutrition Programmes, 2nd Printing, United Nations University.
3. Ritchie, JAS (1979): Learning Better Nutrition, Nutritional Studies number 20, FAO, Rome.
4. Gopal Das T and Seshadri S (1988): Nutrition Monitoring and Assessment, Oxford University Press.
5. Mason JB, Habicht, JP, Tabatabai H and Valverde V (1984): Nutritional Surveillance, World Health Organisation.
6. Park K (2017): Textbook of Preventive and Social Medicine, 24th Ed. Banarsidas Bhanot Publishers.
7. King MH, King PMA, Morley D and AP Burgess (2015): Nutrition for Developing Countries, ELBS Oxford University Press.
8. Passmore R and Eastwood MA (1986): Davidson and Passmore's Human Nutrition & Dietetics, 8th Revised Ed. Churchill Livingstone.
9. Seshubabu VVR (2011): Review in Community Medicine, 2nd Ed, Paras Medical Books Pvt Ltd.

10. MahajanBK,RoyRN,SahaI,Gupta,MC(2013):TextbookofPreventiveandSocialMedicine, 4thEd. JapeeBrothers.
11. VirSC(2011):PublicHealthNutritioninDevelopingCountries,WoodheadPublishingIndia.
12. BamjiMS,KrishnaswamyKandBrahmamGNV(2017):TextbookofHumanNutrition,4th Ed.Oxford&IBHPublishingCo.Pvt.Ltd.
13. SuryatapaDas(2018)TextbookofCommunityNutrition2ndEd.AcademicPublishers.

Semester:I

CourseName:FUNDAMENTALS OF NUTRITION SCIENCE I

CourseCode:BSCNUTMN101

CourseType:Minor (Theoretical)	CourseDetails:MNC-1		L-T-P:4-1-0		
Credit:5	FullMarks:1 00	CAMarks		ESEMarks	
		Practical	Theoretical	Practical	Theoretical
		...	30	70

CourseLearningOutcomes:

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1. *To help students recognize that food is a basic requirement of life.*
2. *Describe basic food preparation techniques.*
3. *Identify the physical, chemical, and/or microbiological changes in food caused by heat, enzymes, changes in pH, freezing, incorporation of air, and mechanical manipulation.*
4. *Understand food quality.*
5. *Learn fundamentals of modifying recipes to meet current nutrition recommendations for fat, cholesterol, fiber, etc. without sacrificing flavor or appearance.*
6. *Learn to find credible sources of information re. food science and nutrition.*

CourseContent:

Theory

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3. Ritchie, JAS (1979): Learning Better Nutrition, Nutritional Studies number 20, FAO, Rome.
4. Gopaldas T and Seshadri S (1988): Nutrition Monitoring and Assessment, Oxford University Press.
5. Mason JB, Habicht JP, Tabatabai H and Valverde V (1984): Nutritional Surveillance, World Health Organisation.
6. Park K (2017): Textbook of Preventive and Social Medicine, 24th Ed. Banarsidas Bhanot Publishers.
7. King MH, King PMA, Morley D and AP Burgess (2015): Nutrition for Developing Countries, ELBS Oxford University Press.
8. Passmore R and Eastwood MA (1986): Davidson and Passmore's Human Nutrition & Dietetics, 8th Revised Ed. Churchill Livingstone.
9. Seshubabu VVR (2011): Review in Community Medicine, 2nd Ed, Paras Medical Books Pvt Ltd.
10. Mahajan BK, Roy RN, Saha I, Gupta, MC (2013): Textbook of Preventive and Social Medicine, 4th Ed. Japee Brothers.
11. Vir SC (2011): Public Health Nutrition in Developing Countries, Woodhead Publishing India.
12. Bamji MS, Krishnaswamy K and Brahmam GNV (2017): Textbook of Human Nutrition, 4th Ed. Oxford & IBH Publishing Co. Pvt. Ltd.
13. Suryatapa Das (2018) Textbook of Community Nutrition 2nd Ed. Academic Publishers.

Semester:I

CourseName:CommunityNutrition&Epidemiology

CourseCode:BSCNUTSE101

CourseType:SEC (Theoretical)	CourseDetails:SEC-1		L-T-P:3-0-0		
Credit:3	FullMarks: 50	CAMarks		ESEMarks	
		Practical	Theoretical	Practical	Theoretical
		...	15	35

CourseLearningOutcomes:

Afterthecompletionofcourse,thestudentswillhaveabilityto

1. *Acquireknowledgeinepidemiologicalaspects*
2. *BecomeprofessionalsinPublichealthNutrition*
3. *Excelinassessmentofnutritionalstatusonthecommunity*
4. *Developcomprehensiveskillsinpublichealthnutrition*
5. *OpportunitiesingovernmentandNGOsaspublichealthnutritionist*

CourseContent:

Theory

CommunityNutrition

1. ConceptofCommunityanditstype,factorsaffectinghealthofCommunity-environmental,social,culturalandeconomic.
2. Communityhealthdata-spanandvitalstatisticsofinfants,childandmaternalmortalitystatisticaldataanalysis(mean, median,mode,students'ttest)
3. Nutritional assessment –different anthropometricmeasurement and interpretation,clinicalsigns,BMI,bodyfatpercentage,useofgrowthcharts
4. Diet survey-importance methods, concept of consumption units, distribution of food-individualinfamily.
5. Concept of nutritional surveillance system and international, national and regionalagencies organizations, Nutritional intervention programmes-ICDS, Mid day mealprogramme,Nationalprophylaxis.
6. Malnutrition-introduction,causesandprevention

Epidemiology

1. Epidemiologyofnutritionrelateddisease,studyofepidemiologicalapproaches,determinant of diseases, preventive and social means incidence & prevalence rate of disease, epidemiological triad.
2. Different methods of epidemiological studies; case study, case control study, cohort study.
3. Communityoffoodprotection,epidemiologyoffoodbornedisease-modeoftransmission,controland prevention.
4. Community water and waste management: water borne infections agent, safe drinkingwater, potable water, waste and waste disposed. Sewage treatment, solid &

liquid waste disposal.

References/Suggested Readings

1. Jelliffe DB. Assessment of the Nutritional Status of the Community; World Health Organisation.
2. Sahn DE, Lockwood R, Scrimshaw NS (1988): Methods for the Evaluation of the Impact of Food and Nutrition Programmes, 2nd Printing, United Nations University.
3. Ritchie, JAS (1979): Learning Better Nutrition, Nutritional Studies number 20, FAO, Rome.
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11. Vir SC (2011): Public Health Nutrition in Developing Countries, Woodhead Publishing India.
12. Bamji MS, Krishnaswamy K and Brahmam GNV (2017): Textbook of Human Nutrition, 4th Ed. Oxford & IBH Publishing Co. Pvt. Ltd.
13. Suryatapa Das (2018) Textbook of Community Nutrition 2nd Ed. Academic Publishers.

Semester:II

CourseName:FUNDAMENTALS OF NUTRITION SCIENCE II

CourseCode:BSCNUTMJ102

CourseType:Major (Theoretical)	CourseDetails:MJC-2		L-T-P:4-1-0		
Credit:5	FullMarks:1 00	CAMarks		ESEMarks	
		Practical	Theoretical	Practical	Theoretical
		...	30	70

CourseLearningOutcomes:

Afterthecompletionofcourse,thestudentswillhaveabilityto

1. To help students recognize that food is a basic requirement of life.
2. Describe basic food preparation techniques.
3. Identify the physical, chemical, and/or microbiological changes in food caused by heat,enzymes, changes in pH, freezing, incorporation of air, and mechanical manipulation.
4. Understand food quality.
5. Learn fundamentals of modifying recipes to meet current nutrition recommendations for fat,cholesterol, fiber, etc. without sacrificing flavor or appearance.
6. Learn to find credible sources of information re. food science and nutrition.

CourseContent:

Theory

UNIT 1: Mother child health care:

- Definition of health care, and types.
- Teenager pregnancy as double burden pregnancy, undernutrition teenager pregnancy as triple burden pregnancy.
- Mother and child as a single unit
- Antenatal care, intra natal care, postnatal care.
- Child care and child immunization.
- Care in breast feeding, weaning; definition, process of weaning, hygiene and sanitation of weaning.
- Supplementary feeding of preschool children: brief description.

UNIT 2: Diet in Health and Disease:

Causes, physiological conditions, clinical symptoms and dietary management of:

- Fever (typhoid, tuberculosis)
- Eating disorders (anorexia nervosa, bulimia, binge eating)
- Overweight/obesity
- Brief concept of dietary management of hypertension and diabetes.

UNIT 3: Food Safety and Quality Control:

- Food Hazards (physical, chemical, biological) Food borne Diseases: Cholera, Typhoid, Salmonellosis) Concept, Causes and preventive measures

- Personal Hygiene
- Food Hygiene and Sanitation and Environmental Sanitation and Safety (Water supply, Waste Disposal) at home level.
- Food Adulteration: Concept/Definition as given by FSSAI, Common adulterants present in foods (cereals, pulses, milk and milk products, fats and oils, sugar, honey, spices and condiments), Ill effect of adulterants (metanil yellow, argemone, kesari dal) on human health common methods for detecting adulteration at home)
- FSSAI Act 2006
- Reading and Understanding Food labels with reference to food products.

UNIT 4: Nutrition Education, Communication and Behaviour Change:

- Information, Education and Communication (IEC) for Behaviour Change: Definition, Nutrition Education: Need, Scope and Importance
- Process of nutrition education communication
- Nutrition Communication: Media and Multi-Media combinations: Types (Interpersonal communication: Individual and group approach; Mass Media, Traditional Media)

UNIT 5: Health Care System:

- Ecological concept of health care system
- Primary, secondary, tertiary health care system.
- Prevention of diseases; primordial, primary, secondary, and tertiary prevention
- Village level health care system; role of anganwadi workers, ASHA workers, multipurpose health workers, role of subcenters, ICDS centers.

References/Suggested Readings

1. Jelliffe DB. Assessment of the Nutritional Status of the Community; World Health Organisation.
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13. Suryatapa Das (2018) Textbook of Community Nutrition 2nd Ed. Academic Publishers.

CourseName:FUNDAMENTALS OF NUTRITION SCIENCE II

CourseCode:BSCNUTMN102

CourseType:Minor (Theoretical)	CourseDetails:MNC-2		L-T-P:4-1-0		
Credit:5	FullMarks:1 00	CAMarks		ESEMarks	
		Practical	Theoretical	Practical	Theoretical
		...	30	70

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CourseContent:

Theory

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5. Mason JB, Habicht, JP, Tabatabai H and Valverde V (1984): Nutritional Surveillance, World Health Organisation.
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12. Bamji MS, Krishnaswamy K and Brahmam GNV (2017): Textbook of Human Nutrition, 4th Ed. Oxford & IBH Publishing Co. Pvt. Ltd.
13. Suryatapa Das (2018) Textbook of Community Nutrition 2nd Ed. Academic Publishers

Semester - II

Course Name: Fundamentals of Food science

Course Code: BSCHNUTSE201

Course Type: SEC (Theoretical)	Course Details: SEC-2		L-T-P: 3-0-0		
Credit: 3	Full Marks:	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical

	50	15	35
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Course Learning Outcomes:

After the completion of course, the students will have ability to

1. Gain knowledge on food groups, food pyramid and understand cooking methods with the application in balanced menu planning.
2. Apply the knowledge of nutritional classification, understand the changes in pigments and acquire skills in preserving nutrients and pigments in the processing and storage of vegetables and fruits.
3. Collect knowledge on nutritive value, understand the cooking quality factors and develop skills in the preparation and storage of milk and egg products.
4. Gather knowledge on the structure and nutritive value, understand the processing factors and acquire skills in processing and storage of flesh foods.
5. Gain skills to process and store cereals, pulses, nuts and oilseeds.

Course Content:

Food Science

Theory

Basic concept of Food & Nutrition, Classification of Food & Nutrition, food group.

1. Carbohydrate: Definition, properties, classification with structure, sources, daily requirement & function, effect of too high & too low carbohydrate on health, blood glucose, glycemic index.
2. Lipids: properties, sources, daily requirement & function, PUFA, MUFA, SFA, omega fatty acid-composition, properties, type & nutritionalsignification.
3. Proteins: Definition, sources, daily requirement & functions, effect of too high & too low proteins on health, Assessment, Factors effecting protein bio-availability including anti-nutritional factors, amino acid classification, type, structure & function.
4. Special food type & components: GM food, super food, Organic food, fast food, junk food, convenience food, prebiotics, probiotics, antioxidants.
5. Food standards: ISI, Agmark, FPO, MPO, PFA, FASSI.
6. Sensory characteristics of food: -types, importance.
7. Cereals and pulses: cereals products, breakfast cereals, processing and storage, varieties, storage, processing, and use in different preparations, nutritional aspect.
8. Milk and milk products: - composition, classification, selection quality, processing storage and use in different preparations, nutritional aspect.
9. Fish, Meat and poultry (meat, egg)): types, selection, storage, uses, spoilage and its detection, nutritional aspect.
10. Vegetables and fruits: types, selection, storage, availability, nutritional aspect of raw and processes products and use in different preparations.
11. Fats and oils, Sugar, bakery, beverages: general concepts about their nutritional aspects.

References/ Suggested Readings:

1. SrilakshmiB (2017): Nutrition Science,6th Multicolour Ed. New Age International (P) Ltd.
2. RodayS(2012): Food Science and Nutrition, 2nd Ed. Oxford University Press.
3. Mann J and Truswells(2017) : Essentials of Human Nutrition, 5th Ed. Oxford University Press.
4. Wilson K and Walker J(2000): Principles and Techniques of Practical Biochemistry, 5th Ed.

Oxford University Press.

5. Sadasivan S and ManikamK(2007): Biochemical Methods, 3rd Ed. New Age International (P) Ltd.

6. Oser B L(1965). Hawk's Physiological Chemistry, 14th Ed. McGraw-Hill Book

7. Nath RL and NathRK(1990). Practical biochemistry in clinical medicine, 2nd Ed. Academic Publishers.

8. Sen AR, Pramanik NK and Roy SK(2001): A treatise on analysis of food fat and oil, Oil Technologists Association of India (EZ), Kolkata, 76, 119.

9. Swaminathan MS Food Science, Chemistry and Experimental Foods, Bangalore Print & Publishing Company.

10. SrilakshmiB(2018): Food Science, 7th Colour Ed. New Age International (P) Ltd.

11. L Davies, S (1998): Food Commodities Ltd. London.

12. Hughes O and Bennion, M (1970): Introductory Foods, 5th Ed. Macmillan& Co., New York.

13. Parker R and Pace M (2016):Introduction to Food Science and Food Systems, 2nd Ed. Delmar Cengage Learning.

14. Meyer LH(2004): Food Chemistry, 1st Ed. CBS Publishers and Distributors, New Delhi.

15. Mudambi SR, Rao SM and Rajagopal MV(2006): Food Science, 2nd Ed. New Age International (P) Ltd.

16. Manay SN and Shadaksharaswamy, M. (2008): Foods: facts and principles , 3rd Ed. New Age International (P) Ltd.

17. Potter NN and Hotchkiss JH(1999): Food science,5th Ed, Spinger.