Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly known as West Bengal University of Technology)
Syllabus of B.Sc. (Dietetics and Nutrition)
Effective from academic session 2023-2024

Semester I

FYBDN 101 BASICS OF NUTRITION

3 Credit, Total Hours - 30 Hours + 15 Tutorial Hours

Course Objectives:

1. Basic knowledge about nutrition, energy, growth and development.

2. Basic knowledge regarding macro- and micro-nutrients and their role in nutrition

Sl. No.	Course Outcome (CO)
1	Remember and understand the concept of nutrition.
2	Understand the energy in human nutrition.
3	Develop the knowledge of macro- and micro-nutrients and their role in nutrition
4	Develop the knowledge and skill for determining the nutritional requirement of an individual
5	Develop knowledge regarding vitamins and minerals and its role in nutrition
6	Remember and understand the concept of Functional foods

UNIT I: 5 Hours

Definition of food, nutrition, health, Nutraceuticals and Nutrigenomics. Dimension of health and function of

food- Physical, social and mental health. Food guide – Basic food groups, my plate

UNIT II 5 Hours

Energy requirements:

Factors affecting energy requirements,

BMR - activity, age, climate, diet induced thermogenesis (SDA), Physiological conditions.

RDA (ICMR) - formation, uses

UNIT III: (5 Hours)

Macronutrients:

Protein, Carbohydrate, Fat-Classification, functions, Digestion & absorption (in brief), RDA, sources and deficiencies.

UNIT IV: (5 Hours)

Micronutrients

Macro-minerals

Calcium, Phosphorus and magnesium: Functions, absorption, RDA, sources and deficiencies.

Micro Minerals:

Sodium, Potassium, Iron, Zinc, Fluorine and Iodine, Copper, Selenium: function, absorption, RDA, sources and deficiency.

Vitamins

Fat-soluble Vitamins (A, D, E & K)

Function, RDA, sources and deficiency and excess.

Water soluble vitamins: Thiamin, Riboflavin, Niacin, B6, B12, Folic acid, Biotin and Vitamin C: functions, RDA,

food sources, deficiencies and excess.

UNIT V: Water and Electrolytes. (5 Hours)

Water: Functions, requirements, sources, water balance

Electrolyte and acid base balance: Electrolyte- Sodium, Chloride, Potassium sources and RDA, function

UNIT VI: Functional foods (5 Hours)

Phytonutrients: Phytates, Tannins and Polyphenols, their sources and functions

FYBDN 191 BASICS OF NUTRITION PRACTICAL

2 Credits, Total hours 60 (40 + 20 self-paced practice)

1. Weights and measures.

2. Standardization of recipes.

3. Introduction to Recommended Dietary Allowances/Nutritive value of foods.

4. Calculation of energy balance among college going girls.

5. Enhancing the traditional recipes with specific nutrients (protein, carbohydrate, fat, vitamin A, vitamin C, calcium and iron).

6. Visit to the analytical lab for demonstration of protein and fat estimation.

References:

1. Antia F.P., Philip Abraham, Clinical Dietetics and Nutrition, Oxford University Press; 4th edition.

2. Srilakshmi, B.(2019):Dietetics,8th edition, New Age International(P) Limited Publishers, New Delhi

3. Kathleen Mahan L., Sylnia Escott-Stump, Krause's food, nutrition and diet therapy (11th edition). Saunders company,

London.

4. Passmore R. and Davidson S. (1986) Human nutrition and Dietetics. Liming stone publishers.

5. Robinson C.H. Careme, Chenometh W.L., Garmick A.E. (1986) 16th edition Normal Therapeutic nutrient. Publish by Mc

Millan Company New York.

6. Shil's M.E., Alfon J.A., Shike M (1994), Modern nutrition in health and diseases eighth edition.

7. William S.R., Nutrition and Diet Therapy fourth edition C.V. Mos Company.

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FYBDN 102 Microbiology of Food

3 credits, Total hours- 30 Hours + 15 Tutorial Hours

Course Objectives:

1. Familiarize students with the general characteristics and growth characteristics of microbes.

2. Broad understanding of spoilage microorganisms and their effects on food and to get an idea about beneficial organisms.

3. Basic knowledge about the microbes present in the environment and handling of waste disposal.

#	Course Outcome (CO)
1	Remember and understand the concept regarding the different types and morphology of microorganisms and magnification capacity of different types of microscopes.
2	Remember and understand the concept regarding the factors affecting the growth in controlling the growth curve of microorganisms
3	Remember and apply the level of skill required to preserve the perishable foods from different types of microbial spoilage.
4	Remember and apply the level of skill required to preserve the non-perishable foods from microbial contamination and spoilage.
5	Explore the beneficial effects of microorganisms in the processing and development of fermented foods.
6	Know the different types and morphology of microorganisms and magnification capacity of different types of microscopes.

UNIT I: (6 Hours)

Introduction to Microbiology-A. Scope of Microbiology, Food Microbiology its origins - historical Roots-(brief), Germ theory of Disease,

B. Naming, Classification and identification, morphological characteristics of Bacteria (Salmonella typhi and Salmonella paratyphi,

Clostridium perfringens and Clostridium botulinum, Escherichia coli, Campylobacter, Listeria monocytogenes, Staphylococcus aureus)

Fungi (Alternaria, Aspergillus, Candida, Fusarium, and Saccharomyces, mucoromycetes) and viruses (Norovirus, Rotavirus, hepatitis A,E,

Adenovirus, Astrovirus) Yeast (baker's yeast)

UNIT II: (6 Hours)

Growth and Culturing of Bacteria-Growth and cell Division, Factors affecting Bacterial Growth- (Physical factors and

nutritional factors),Culturing bacteria- (Methods of obtaining pure cultures, culture media, maintaining cultures).

UNIT III (6 Hours)

Factors affecting the growth of microorganisms-temperature, water activity, pH, oxygen and redox, interaction of factors and between organisms. Death of microorganisms and microbial populations- A . Heat, preservation of foods (appertization, pasteurization).

B.Chemical agents-factors influencing activity of sanitizers, preservatives, hurdle effect,

C. Radiation-preservation, D. High pressure (brief) Definition of FSSAI, HACCP-A Food Safety Assurance system (importance of quality control of food from microbial aspect)

UNIT IV: (6 Hours)

Food Spoilage- Nature, Causes, Contamination, Composition of spoilage, Changes in foods caused by spoilage organisms,

Influence of processing, Spoilage of important food commodities and food products -Meat, Fish, Egg and Milk, Fruits and Vegetables, Cereals

UNIT V: (6 Hours)

Food –borne disease and food poisoning: cause of disease, investigations and origins of food poisoning outbreaks, importance of food poisoning to individual and economy, control, Food poisoning bacteria causing:

1. Infections- Salmonella, Shigella, E.coli, Vibrio cholerae,Campylobacter Jejuni,Clostridium Prefringens,

2. Intoxications-Staphylococcus aureus, Streptococcus aureus, Clostridium Botulinum, Bacillus Cereus,

3. Viruses-Hepatitis A, B, C

References

1. Joshua. A.K. Microbiology - India printing works, Madras -1971.

2. Carpenter, Microbiology - W.B. Saunders Co.,London.

3. Salie. A.J. Fundamental principles of Bacteriology - MCGraw Hill Book Co.,

4. R.C.Rubey & D.K. Maheshwari; A Textbook of Microbiology

5. Pelczar J. Michael; Microbiology concepts and Application

6. Ananthanarayan. R. & Paniker C.K.J; Textbook of Microbiology.

7. Frazier.W.C; Food Microbiology-McGraw Hill Book and Co; New York.

8. Smith and Water; Introductory food services-McGraw Hill Book and Co., New york,1971.

9. West Wood and Harger; Food Service in Institutions, 1966. John Wiley and Sons. Incorporation, New York, London.

10. ADAMS M.R. and MOSS M.O; Food microbiology, the Royal society and chemistry. Cambridge 1991.

11. Banwart. G.J; Basic food microbiology, Chapman and Hall, NewYork. HOBBS BC and Roberts. D;

12. Food poisoning and food Hygiene. Edward Amold (A division of Hodder and Stoughton),London.

13. Sarda Mornmore; HACCP, A practical Approach,Edn.1997.

14. Frezier and Westhoff,5th Edition Food Microbiology, McGraw Hill Education, 2017

FYBDN 192 Microbiology of Food Practical

2 credits, Total hours- 30 Hours + 20 self-paced practice hours

1. Use of equipment- microscope, autoclave, hot air oven, incubator, laminar .

2. Preparation of slides- bacterial smears, simple staining, differential staining, staining of yeast and molds.

3. Morphological identification of important yeast and mold in foods (slides and culture)- rhizopus, mucor, aspergillus, penicillium, fusarium, cladosporium, alternaria.

4. Preparation of common laboratory media for cultivation of bacteria, yeast and molds. Use of readily available media for cultivation.

5. Isolation of microorganisms by pour plate method (dilution) spread plate and streak plate method.

6. Demonstration of microbiological analysis of water for enumeration of standard plate count and coliform count.

Reference Books:

1. Frazier, W.C. and Westhoff D.C (1988) fifth edition Food microbiology, Mc Graw Hill Inc.

2. Jay James.M. (1986) third edition, Modern food microbiology, Van Nostrand Reinhold Company Inc.

3. Pelczar, Chan, Krieg, Microbiology, fifth edition Tata Mc. Graw Hill (1993). Jay JM,LoessnerMJ,and Golden DA(2005)

4. Jacquelyn G Black Microbiology principles and Explorations John Wiley and Sons, Inc (2008)

5. Microbiology Prescott Harle Klen 4th ed, Mc.Graw Hill Essentials of Food microbiology JohnGarbutt

6. Microbiology Schaums Outlines I E ALCAMO Tata Mc Graw –Hill Publishing Company Ltd New Delhi