MANGALORE UNIVERSITY

DEPARTMENT OF BIOCHEMISTRY

MSc in Biochemistry

SOFTCORE BCS 506: FOOD SCIENCE

Total number of lecture hours: 42 **Total number of credits: 03**

Course objectives

- To study the different molecular components in food
- To study the importance of proteins, carbohydrates and fatty acids
- Nutritional management during lifestyle associated disorders and gastrointestinal disorders.
- Food spoilage by microbes and their management, food borne diseases.
-

Course outcomes

- The student learns about the molecular components in food like carbohydrates, proteins, lipids, fatty acids, macronutrients and micronutrients
- The sources and physiological role of proteins, carbohydrates and fatty acids
- Management of gastrointestinal disorders and other metabolic disorders through diet
- Microbes - spoilage of foods, food borne diseases and fermented food products

Unit I **14hrs.**

Basic concept on Food. Nutrients. Nutrition, Classification of Food. Classification of Nutrients. Carbohydrates - Sources, dailyrequirements,functions.Effectsoftoohigh-toolowcarbohydratesonhealth.Digestion&Absorption.Bloodglucose and effect of different carbohydrates on blood glucose. Glycaemic Index. Functional role of Sugars in food, Fermentation of Sugar. Proteins - Sources, daily requirements, functions. Effect of too high - too low proteins on health. Digestion & absorption. Assessment of Protein quality (BV, PER, NPU). Factors affecting protein bioavailability including anti-nutritionalfactors.Lipids-Sources,dailyrequirements,functions.Digestion&Absorption.Role&nutritionalsignificances of PUFA, MUFA, SFA, W-3 fatty acid. Dietary Fiber - Classification, sources, composition, properties & nutritional significance. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bioavailability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium). Vitamins - Bio-Chemical and Physiological Role Physiological role, bioavailability and requirements, sources, deficiency & excess. Water - Functions, daily requirements, Water balance. Elementary idea of Probiotics, Prebiotics, Organic Food.

Unit II **14hrs.**

Therapeuticnutrition,complications,preventionandrecentadvancesinnutritionalmanagementofGITdisorders,Gastritis, types, dietary modification, peptic ulcer, etiology, symptoms, dietary modification, Diarrhea – Classification, dietary consideration, Constipation, classification, dietary consideration, Ulcerative colitis symptom, dietary

treatment, Disease of liver and gall bladder. Diseases of liver and gall bladder, Jaundice – classification and dietary treatment, Hepatitis – types and dietary management. Hepatic coma – causes and dietary management, Cirrhosis- Type and dietary management, Cholecystitis- Types and dietary management, Pancreatic disorders: etiology, pathogenesis and nutritional care. Cardiovascular diseases: Classification. Hyperlipidemia, Classification and nutritional care. Atherosclerosis – Etiological factors, pathogenesis dietetic management. Hypertension – Classification, etiology, nutritional care.

Unit III **14hrs.**

Growth and Nutrition of Bacteria: Intrinsic and extrinsic parameters that affect microbial growth. Importance of microorganisms in food microbiology - Mold, yeast, bacteria. Spoilage of different groups of foods: Cereals and cereal products,vegetablesandfruits,Fishandfishproducts,Meatandmeatproducts,Eggsandpoultry,Milkandmilkproducts, Canned foods. Contamination of foods, Food Preservation, General principles of food preservation, preservation methods (High temperature, low temperature, drying, food additives and radiation), Foods in relation to disease, Food borne illness, Bacterial and viral food borne disorders, Food borne important animal parasites, mycotoxins. Fermented Foods, Role of microbesinfermentedfoods,Fermenteddairyproducts,Fermentedvegetables,Fermentedmeat,Fermentedfish,Beverage and distilledproducts.

REFERENCES:

Block, J.G. (1999) Microbiology Principles and Exportations, 4th
Edition John Wiley and Sone Inc. Jay, James, M. (2000) Modern
Food Microbiology, 6th Edition, Aspen publishers, Inc.,Maryland.
Bansart, G. (1989) Basic Food Microbiology, 2th Edition, CBS Publisher.
Frazier, W.C. and Westhoff, D.C. (1998): Food Microbiology. Tata McGraw Hill Book Company, New Delhi, 4th Edition. James, M.J. (1987): Modern Food Microbiology, CBS Publishers, New Delhi, 3rd edition.
Pelezar, M.I. and Reid, RD. (1993): Microbiology, McGraw Hill Book
Company, New York,5th edition. Adams, M.R., Moss, M.O. (1995):
Food Microbiology, New Age International (P.) Ltd., Delhi.
Banwart G.J. (1987): Basic Food Microbiology, CBS Publishers and Distributors, Delhi.