Programme: M.Sc. (Biochemistry)

Course Code: BCO 105

Title of the Course: NUTRITION AND FOOD BIOCHEMISTRY [T]

Number of Credits: 3

Effective from Academic Year: 2018-19

Prerequisites	Basic knowledge in Biochemistry and Microbiology.	
Objective:	To learn about the basic nutrients in foods; deficiency diseases and food preservation.	
Content:		
1	**Vitamins, Minerals, Water, Fibre**	**(15)**
1.1	Fat soluble vitamins: physiological role, deficiency disorders, toxicity.	
1.2	Water soluble vitamins: physiological role, deficiency disorders, toxicity.	
1.3	Mineral metabolism: macronutrients – calcium, magnesium, sodium, potassium, phosphorus, sulphur and chlorine; trace elements – essential and non-essential; physiologic role and deficiency disorders.	
1.4	Dehydration	
1.5	Fibre and its significance in diet.	
2	**Nutritional Disorders and Diseases**	**(09)**
2.1	Protein malnutrition disorders – Marasmus, Kwashiorkar.	
2.2	Carbohydrate excess and imbalanced diets.	
2.3	Eating disorders – Anorexia nervosa, Bulimia	
2.4	Starvation	
3	**Food Spoilage and Food Preservation**	**(12)**
3.1	Forms of food spoilage – physical, chemical, microbiological.	
3.2	Predictive food microbiology - Types of foods and their spoilage	
3.3	Factors affecting the growth and survival of microorganisms in foods: Intrinsic and extrinsic	
3.4	Food preservation technologies: Heat processing, low temperature storage, control of water activity, irradiation, high pressure processing, modified atmospheres, preservatives: chemicals, natural organic molecules (nisin) and enzymes	
3.5	Quality control and Validation	
A.	Microbiological examination of foods	
B.	Plant sanitation	
C.	Hazard Analysis and Critical Control Point (HACCP) concept.	
3.6	Good Manufacturing Practice (GMP) and Quality Systems	

Pedagogy:	Lectures/ tutorials/ assignments/ students' seminars/ interactive learning/ self-study.	
References/ Readings	Frazier, W. C & Westhoff, D. C., M. C. Food Microbiology. Graw-Hill Companies, Inc., New York.	
	Hayes, P. R. Food Microbiology and Hygiene. Chapman & Hall, London	
	Montrille, T. J. & Matthews, K. R, Food Microbiology., ASM Press, NW Washington, USA. Jay, J.M., Loessner, M.J., Golden, D.A., Modern Food Microbiology. Springer Science, New York.	
	Adams, M. R. & Mass, M. O. Food Microbiology. New Age International Ltd Publishers, New Delhi.	
	Mudambi .R. Sumathi & Rajagpal M.V, "Foods & Nutrition", Willey Eastern Ltd, Second Edition, New Delhi	
	Passmone R. & Eastwood M.A,"Human Nutrition and Dietetics",English language book Society/Churchill Livingstone,Eigth edition, Hong Kong	
	Ray B., & Bhunia A., Fundamental Food Microbiology. CRC Press, Taylor Francis Group New York	
Learning Outcomes	Develop a strong knowledge and understanding on the basic nutrients of foods; deficiency diseases and food preservation mechanisms.	