23SC813 Bio-Active Compounds and Functional Foods

No. of Credits – 4
L-T-P – 3-1-0-4 **Total 60 hrs.**

Course Outcomes

CO1: Understand the concept and benefits of functional foods and nutraceuticals obtained from plant sources

CO2: Understand the concept and benefits of functional foods and nutraceuticals from animal and microbial sources

CO3: Comprehend the benefits of bio-active compounds in treating Obesity, Diabetes Mellitus and Cardiovascular Diseases

CO4: Comprehend the benefits of bio-active compounds in treating Nervous System, Bone Health and Cancer

CO5: Understand recent trends in nutraceuticals

Unit I Introduction to Functional Foods and Nutraceuticals, Functional Compounds from Plant Sources

History of functional foods, Teleology – Definition, Primary and Secondary metabolites, Organisational model for nutraceuticals - a) Food sources b) Mechanism of action c) Chemical nature

Nutrient molecules in plants – a) Phospholipids b) Vitamin K c) Carbohydrte derivatives d) Minerals; Non-Nutrient molecules in plants – a) Phenolic compounds b) Phytosterols and Phytostenols c) Saponins d) Tannins e) Carotenoids; Hypocholesterolemic and Antidiabetic components

Action of herbs and efficacy on – a) Nervous system – Ginseng, St. John's wort, Ginkgo biloba b) Heart and circulatory system – Hawthorn c) Immune system – Echinacea d) Digestive system – Gingervalerian root fennel e) Respiratory system – Licorice root, Kava f) Urinary system – Cranberry, Saw palmeto g) Musculoskeletal system – Fever few

Flowers and Aromatic ingredients – Medicinal value, nutritional importance, culinary uses, effects of cooking of edible and ornamental edible flowers

Unit II Bio-Active and Functional Compounds from Animal and Microbial Sources

Major and minor components in cow's milk and human milk proteins, derived peptides, lactose, fat and minerals

Dietary lipids – Conjugated linolenic acid, Linoleic acid, Oelic acid

Omega 3 and Omega 6 fatty acids and structural lipids

Intestinal flora; Prebiotics and Probiotics as functional ingredients

Unit III Functional Foods and Nutraceuticals in Preventive Dietitics Part 1: Gut Health, Obesity, Diabetes Mellitus and Cardiovascular Diseases

Colonic functional foods – prebiotic, probiotic and symbiotic; Metabolism of colonic foods, host-microbe interaction; Improving the effectiveness of probiotics and prebiotics in optimizing gut health; Role of dietary fiber in gut health

Role of functional foods in the management of obesity; Role of functional foods and nutraceuticals in blood sugar support; Role of functional foods in the management of CVD

Unit IV Functional Foods and Nutraceuticals in Preventive Dietitics Part 2: Nervous System, Bone Health and Cancer

Definition, causes, role of functional foods in Alzeheimers and Parkinsons Disease; Role of functional foods in bone heath and Osteoporosis; Role of functional foods in the prevention of cancer – Symbiotics, Glucosinolates, Phytoestrogens, Dietary fiber, Vitamins and Antioxidants

Unit V Recent Trends in Identification and processing of Bio-active compounds into Potential Nutraceuticals

Conventional and non-conventional extraction techniques, methods of processing, Identification, bio-assay guided analysis of bio-active compounds, formulation and recent trends in nutraceuticals, consumer marketing nand factors for marketing functional foods

References:

1. K Sembulingam and Prema Sembulingam, Essentials of Medical Physiology, Sixth Edition, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, 2017.
2. Hari Niwas Mishra, Functional Foods, New India Publishing Agency, 2016.
3. Functional Foods and Nutraceuticals-Sources and their Development Techniques, New India Publishing Agency, 2015.
4. R Chatwick et al., Functional Foods, Springer, 2003.
5. Isreal Goldberg, Functional Foods, Designer Foods, Pharma Foods, Nutraceuticals., Culinary and Hospitality Industry Publications, 2001.
6. Robert E.C Wildman., Handbook of Nutraceuticals and Functional Foods., Culinary and Hospitality Industry Publications, 2001.