

NIRMA UNIVERSITY
Institute of Pharmacy
(B. Pharm)
(Semester - VIII)

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| Course Code | BP812ET |
| Course Title | Dietary Supplements and Nutraceuticals-Theory |

Scope:

The subject covers foundational topic that are important for understanding the need and requirements of dietary supplements among different groups in the population.

Objectives:

Upon completion of the course the student shall be able to-

1. Understand the need of supplements by the different group of people to maintain healthy life
2. Understand the outcome of deficiencies in dietary supplements.
3. Appreciate the components in dietary supplements and the application
4. Appreciate the regulatory and commercial aspects of dietary supplements including health claims

Course Learning Outcomes (CLO):

At the end of the course, students will be able to -

1. Understand the concept of nutraceuticals and their significance in public health
2. Describe the role of various classes of phytochemicals as nutraceuticals and functional foods
3. Discuss the importance of dietary fibres in functional foods
4. Explain the role of antioxidants in free radicals mediated diseases
5. Develop the understanding of Pharmacopoeial specifications and regulatory aspects of food supplements

Syllabus:

Teaching hours: 45 Hours

UNIT I

07 Hours

Definitions of Functional foods, Nutraceuticals and Dietary supplements. Classification of Nutraceuticals, health problems and diseases that can be prevented or cured by Nutraceuticals i.e. weight control, diabetes, cancer, heart disease, stress, osteoarthritis, hypertension etc. Public health nutrition, maternal and child nutrition, nutrition and ageing, nutrition education in community.

Source, Name of marker compounds and their chemical nature, Medicinal uses and health benefits of following used as nutraceuticals/functional foods: Spirulina, Soyabean, Ginseng, Garlic, Broccoli, Gingko, Flaxseeds

UNIT II

15 Hours

Phytochemicals as nutraceuticals: Occurrence and characteristic features(chemical nature, medicinal benefits) of following

Carotenoids- α and β -Carotene, Lycopene, Xanthophylls, lutein

Sulfides: Diallyl sulfides, Allyl trisulfide.

Polyphenolics: Resveratrol

Flavonoids: Rutin, Naringin, Quercetin, Anthocyanidins, catechins, Flavones

Prebiotics / Probiotics: Fructo oligosaccharides, Lacto bacillum

Phyto estrogens : Isoflavones, daidzein, Geobustan, lignans

Tocopherols

Proteins, vitamins, minerals, cereal, vegetables and beverages as functional foods: oats, wheat bran, rice bran, sea foods, coffee, tea and the like.

UNIT III

07 Hours

Introduction to free radicals: Free radicals, reactive oxygen species, production of free radicals in cells, damaging reactions of free radicals on lipids, proteins, Carbohydrates, nucleic acids.
Dietary fibres and complex carbohydrates as functional food ingredients.

UNIT IV

10 Hours

Free radicals in Diabetes mellitus, Inflammation, Ischemic reperfusion injury, Cancer, Atherosclerosis, Free radicals in brain metabolism and pathology, kidney damage, muscle damage. Free radicals involvement in other disorders. Free radicals theory of ageing.
Antioxidants: Endogenous antioxidants – enzymatic and nonenzymatic antioxidant defense, Superoxide dismutase, catalase, Glutathione peroxidase, Glutathione, Vitamin C, Vitamin E, α -Lipoic acid, melatonin
Synthetic antioxidants: Butylated hydroxy Toluene, Butylated hydroxy Anisole.
Functional foods for chronic disease prevention

UNIT V

06 Hours

Effect of processing, storage and interactions of various environmental factors on the potential of nutraceuticals.
Regulatory Aspects; FSSAI, FDA, FPO, MPO, AGMARK. HACCP and GMPs on Food Safety. Adulteration of foods.
Pharmacopoeial Specifications for dietary supplements and nutraceuticals and their Recommended Daily Intake (RDI).

Tutorials

Teaching hours: 15 Hours

Tutorials will be based on above syllabus.

Suggested Readings[^]: (Latest Edition)

1. Srilakshmi, B. (2007). *Dietetics*. New Age International.
2. Augusti, K. T. (2009). *Role of Dietary Fibers and Nutraceuticals in Preventing Diseases*. PharmaMed Press.
3. Cooper, K. H., & Kenneth, H. (1997). *Advanced nutritional therapies*. Thomas Nelson Publishers.
4. Carper, J. (1992). *The Food Pharmacy guide to good eating*. Bantam.
5. Balch, J. F., & Balch, P. A. (1990). *CNC, Prescription for Nutritional Healing*. Garden City Park, NY: Avery Publishing Group Inc.

6. Gibson, G. C. Williams Editors 2000 *Functional foods* Woodhead Publ. Co. London.
7. Goldberg, I. *Functional Foods*. 1994.
8. Labuza, T. P. (2000). *Functional Foods and Dietary Supplements: Safety, Good Manufacturing Practice (GMPs) and Shelf Life Testing in Essentials of Functional Foods* MK Sachmidl and TP Labuza eds
9. Wildman, R. E. (2016). *Handbook of nutraceuticals and functional foods*. CRC press.
10. Shils, M. E., Olson, J. A., & Shike, M. (1994). *Modern nutrition in health and disease*. Lea and Febiger, Philadelphia.

L= Lecture, T= Tutorial, P= Practical, C= Credit

^ this is not an exhaustive list
