

Abhiyaan [online]. Available at: <https://www.mygov.in/campaigns/poshan-abhiyaan-2024/> (Accessed: December 14, 2024).

- Ministry of Women and Child Development (MWCD), Government of India. POSHAN Abhiyaan [online]
https://wcd.delhi.gov.in/sites/default/files/WCD/generic_multiple_files/final_saksham_anganwadi_and_mission.pdf (Accessed: December 14, 2024).
- National Health Mission [online]
<https://nhm.gov.in/index1.php?lang=1&level=3&sublinkid=1448&lid=797> (Accessed: December 14, 2024).

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi.

DISCIPLINE SPECIFIC ELECTIVE – DSE-14-FT: FUNCTIONAL FOODS AND NUTRACEUTICALS

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Functional Foods and Nutraceuticals	4	3	0	1	Class XII	Nil

LEARNING OBJECTIVES:

- To develop comprehensive understanding of different functional foods and nutraceuticals
- To describe the role of nutraceuticals and functional foods in preventing chronic diseases and enhancing overall health
- To understand the regulatory aspects pertaining to marketing and labelling of functional foods and nutraceuticals

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

- Elucidate the different types of nutraceuticals and functional foods
- Comprehend the effectiveness of nutraceuticals and functional foods in promotion of human health
- Understand food sources amalgamated with functional and bioactive compounds
- Acquire knowledge about the regulatory aspects of functional foods and nutraceuticals

SYLLABUS OF DSE-14-FT

THEORY (Credits: 3; Hours: 45/)

UNIT I: Introduction to Functional Foods and Nutraceuticals

(6 Hours)

Unit Description: This unit provides an overview of the definitions, historical evolution, and distinctions between functional foods and nutraceuticals, along with insights into their current status and market trends in India.

Subtopics:

- Definitions and history
- Difference between functional foods and nutraceuticals
- Current status of functional foods and nutraceuticals in India
- Market trends of functional foods and nutraceuticals

UNIT II: Functional Foods in Health Promotion

(15 Hours)

Unit Description: This unit will describe the types of functional foods with their potential health benefits.

Subtopics:

- Types of functional foods - Cereal and cereal products, milk and milk products, egg, oils, meat and products, sea foods, nuts and oilseeds, functional fruits and vegetables, herbs and spices, beverages (tea, wine), fermented foods
- Potential health benefits and role in cardiovascular diseases, hypertension and diabetes

UNIT III: Nutraceuticals in Health Promotion

(18 Hours)

Unit Description: This unit will describe the types of nutraceuticals with their potential health benefits.

Subtopics:

- Types of nutraceuticals: phytochemicals- isoprenoids, polyphenolics, phytosterols; carbohydrates- (dietary fibers, oligosaccharides and resistant starch); proteins and peptides, lipids- conjugated linoleic Acid, omega-3 fatty acids, fat replacers; vitamins and minerals; microbial- probiotics, prebiotics and synbiotic; sources and stability of nutraceuticals
- Health benefits- cardiovascular diseases, cancer, diabetes, cholesterol management, obesity, joint pain, immune enhancement, age-related macular degeneration, endurance performance and mood disorders – compounds and their mechanisms of action

UNIT IV: Regulatory Aspects

(6 Hours)

Unit Description: This unit addresses the safety, labeling, marketing, and regulation of functional foods and nutraceuticals, alongside consumer acceptance and future trends.

Subtopics:

- Safety, consumer acceptance and health claims
- Labeling, marketing and regulatory aspects
- Future prospects

TUTORIAL
(Credit: 1; Hours: 30)

1. Survey of available nutraceuticals in the market.
2. Design a food label for a nutraceutical product.
3. Draft a review paper on any selected functional food or phytochemical with its potential health promotional aspects.

ESSENTIAL READINGS (Theory and Practical):

- Wildman, R. E. and Bruno, R.S. (2021). Handbook of nutraceuticals and functional foods. (3rd edn.). CRC press
- Egbuna, C., & Dable-Tupas, G. (2020). Functional foods and nutraceuticals. Springer Nature Switzerland AG, 1, 1-632.
- Bagchi, D., Preuss, H. G., & Swaroop, A. (Eds.). (2015). Nutraceuticals and functional foods in human health and disease prevention. CRC Press.
- Food safety and Standards Authority of India, Government of India . Food Safety and Standards (Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, and Prebiotic and Probiotic Food) Regulations, 2022. https://www.fssai.gov.in/upload/uploadfiles/files/Direction_New_compressed.pdf. (Assessed on 14 December 2024)
- Malve, H., & Bhalerao, P. (2023). Past, present, and likely future of Nutraceuticals in India: Evolving role of pharmaceutical physicians. *Journal of Pharmacy and Bioallied Sciences*, 15(2), 68-74. DOI: 10.4103/jpbs.jpbs_96_23 (Assessed on 15 December 2024).

SUGGESTED READINGS:

- Bashir, K., Jan, K., & Ahmad, F. J. (2024). Functional Foods and Nutraceuticals: Chemistry, Health Benefits and the Way Forward. Springer.
- Bulathgama, U., Lakshman, N., & Bulugahapitiya, V. P. (2022). Recent Trends in Functional Foods and Nutraceuticals as Health-Promotive Measures: A Review. *globe*, 7, 9.
- Rani, V., & Yadav, U. C. (Eds.). (2018). Functional food and human health. Springer.
- Mahan, L. K., & Raymond, J. L. (2016). Krause's Food & the nutrition care process, Iranian Edition E-Book. Elsevier Health Sciences.
- Yadav, V., Pandey, P., Mittal, V., Khatkar, A., & Kaushik, D. (2015). Marketing nutraceuticals in India: An overview on current regulatory requirements. *Asian Journal of Pharmaceutical and Health Sciences*, 5(1).
- Noomhorm, A., Ahmad, I., & Anal, A. K. (Eds.). (2014). Functional foods and dietary supplements: processing effects and health benefits. John Wiley & Sons.
- Brar, S. K., Kaur, S. & Dhillon, G. S. (Eds.) (2014). Nutraceuticals Functional Foods- Natural Remedy, Nova Science Publishers, Inc.
- Williams, M., Pehu, E., & Ragasa, C. (2006). Health enhancing foods: opportunities for strengthening the sector in developing countries. The International Bank for Reconstruction and Development/ The World Bank. Washington, DC.