DISCIPLINE SPECIFIC ELECTIVE
DSE FT 06: NUTRACEUTICALS AND FUNCTIONAL FOODS

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE

Course Title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/ Practice		
Nutraceuticals And Functional Foods DSE FT 06	4	2	0	2	Completed VI semester	Should have studied Biology/Biochemistry/Chemistry/Biomedical Science/Home Science in previous semesters

Learning Objectives

- To understand the types of nutraceutical and functional foods
- To understand the potential of various nutraceuticals and functional foods in promoting human health
- To understand the safety issues and consumer acceptance of nutraceutical and functional foods
- To understand labeling, marketing and regulatory issues related to nutraceutical and functional food
- To understand the processing technologies related to development of nutraceuticals and functional foods.

Learning Outcomes

- Differentiate between nutraceuticals and functional foods based on their composition and form.
- Understand the potential health benefits of consuming nutraceuticals and functional foods.
- Knowledge on safety issues and consumer acceptance of nutraceutical and functional foods, including the importance of regulation and quality control.
- Understand the labelling, marketing, and regulatory issues related to nutraceutical and functional food.
- Knowledge of the processing technologies involved in the development of nutraceuticals and functional foods.

SYLLABUS OF DSE FT06

THEORY
(Credits 2; Hours 30)

UNIT I: Gustation **8 Hours**

Unit description: This unit will focus on the physiology of taste, its perception and evaluation techniques.

- Introduction and importance of gustation
- Structure and physiology of taste organs- tongue, papillae, taste buds, salivary glands
- Mechanism of taste perception
- Chemical dimensions of basic tastes- sweet, salt, sour, bitter and umami
- Factors affecting taste quality, reaction time, taste modification, absolute and recognition threshold
- Recent advances in Taste measurement- Electronic Tongue
- Taste abnormalities

UNIT II: Olfaction **7 Hours**

Unit description: This unit will focus on the physiology of smell, its perception and evaluation techniques.

- Introduction, definition and importance of odour and flavour.
- Anatomy of nose, physiology of odour perception
- Pre-requisites of odour perception.
- Mechanism of odour perception
- Recent advances in olfaction measurement – Electronic Nose
- Olfactory abnormalities

UNIT III: Colour **7 Hours**

Unit description: This unit will focus on the importance of colour, its perception and evaluation techniques.

- Introduction and importance of colour
- Dimensions of colour.
- Attributes of colour; gloss etc.
- Perception of colour
- Psychological impact of colour
- Colour Measurement: Hunter colour system, Tintometer.
- Colour abnormalities

UNIT IV: Texture **8 Hours**

Unit description: This unit will focus on texture, its significance, physiology, and measurement.

- Introduction, definition, and importance of texture.

- Significance of sound in texture evaluation
- Physiology of Sense of Touch
- Texture perception
- Phases of oral processing.
- Receptors involved in texture evaluation.
- Texture measurement – basic rheological models, forces involved in texture measurement.

PRACTICAL
(Credits 2; Hours 60)

1. Identification of various nutraceuticals and functional foods available in the market.
2. Estimation of chlorophyll content.
3. Determination of lycopene.
4. Determination of anthocyanins.
5. Estimation of free radical scavenging activity/antioxidant activity by DPPH/FRAP.
6. Estimation of total phenolic content.
7. Estimation of flavonoid content.
8. Development of a functional food.

Essential readings

- Wildman, R.E.C. (2019). Handbook of Nutraceutical and Functional Foods. 3rd ed, CRC Press
- Joyce I. B. (2015). Nutraceutical and Functional Food Processing Technology. United Kingdom: Wiley.
- Bagchi, D., Sreejayan, N. (2016). Developing New Functional Food and Nutraceutical Products. Netherlands: Elsevier Science.
- Egbuna, C., Tupas, G. D. (2020). Functional Foods and Nutraceuticals: Bioactive Components, Formulations and Innovations. Germany: Springer International Publishing.

Suggested readings

- Ranganna, S. (1986). Handbook of analysis and quality control for fruits and vegetable products. Tata McGraw-Hill publishing company limited, Second edition
- Galanakis, C. M. (Ed.). (2021). Nutraceutical and functional food components: Effects of innovative processing techniques. Academic Press.
- Aluko, R. E. (2012). Functional foods and nutraceuticals (pp. 37-61). New York, NY, USA: Springer.

Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.