SEMESTER S8

NUTRACEUTICALS AND FUNCTIONAL FOODS

Course Code	PEFTT863	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None	Course Type	Theory

Course Objectives:

1. To understand the historical development, definitions, and classifications of nutraceuticals and functional foods.
2. To analyze the role of bioavailability and synergy of functional components in managing diseases such as cardiovascular diseases, diabetes, cancer, hypertension, and obesity.
3. To evaluate different food sources and their benefits as functional foods.
4. To examine the marketing strategies, ethical considerations, and consumer behaviour related to functional foods and nutraceuticals.
5. To familiarize and compare the regulatory frameworks and guidelines for functional foods and nutraceuticals.

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SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Introduction to nutraceuticals and functional foods, historical perspective of nutraceuticals, definition, nature, nutraceutical compounds, applications, classification based on chemical/biochemical nature with descriptions, scope and future prospects, Overview of functional foods, definition, classification functional food science and food technology, Impact of food technology on functional food development, Key issues in the Indian functional food industry and nutraceuticals.	9
2	Bioavailability and synergy of functional components in food matrices, antioxidants and disease management, concept of free radicals and antioxidants, role of antioxidants as nutraceuticals and functional foods, disease management, management of cardiovascular diseases, diabetes,	9

	cancer, hypertension, and obesity by nutraceutical compounds, mechanisms of action of these compounds.	
3	Food sources and their benefits, different foods as functional foods, cereal products (oats, wheat bran, rice bran, etc.) fruits and vegetables, milk and milk products, legumes, nuts, oil seeds, and sea foods, herbs, spices, and medicinal plants, coffee, tea, and other beverages as functional foods/drinks and their protective effects,Organosulphur Compounds, pigments: Carotenoids, Lycopene, curcumin, Non nutrient effect of specific nutrients: proteins and peptides and nucleotides, vitamins, minerals.	**9**
4	Marketing and regulatory issues for functional foods and nutraceuticals, CODEX guidelines, EU guidelines, FSSAI guidelines, regulations for nutraceuticals and functional foods, recent updates and amendments, comparative analysis of global regulatory frameworks, challenges in regulatory compliance and future directions.	**9**

Course Assessment Method
(CIE: 40 marks , ESE: 60 marks)

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Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Explain the historical context, definitions, nature, and classifications of nutraceuticals and functional foods.	**K2**
CO2	Explain the mechanisms by which antioxidants and nutraceutical compounds manage diseases.	**K2**
CO3	Identify various functional foods and assess their health benefits.	**K2**
CO4	Develop insights into marketing strategies, ethical issues, and consumer behaviours related to functional foods and nutraceuticals.	**K3**
CO5	Compare global regulatory guidelines for functional foods and nutraceuticals.	**K2**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2											3
CO2	2											3
CO3	3					2						3
CO4	3	3	2	3							2	3
CO5	2	2		2								3

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Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Functional Foods	John Shi, G. Mazza, and Marc Le Maguer	CRC Press Inc	1st edition, 3 June 2015
2	Bioprocesses and Biotechnology for Functional Foods and Nutraceuticals.	FereidoonShahidi, J. Bruce German , Jean-Richard Neeser	CRC Press Inc	2004
3	Functional Foods and Nutraceuticals	Rotimi E Aluko	Springer-Verlag New York Inc.	2012
4	Handbook of Nutraceuticals and Functional Foods	Wildman, R. E.	CRC Press Inc	2016

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Nutraceuticals Functional Foods	Gurpreet Singh	Nova Science Publishers Inc	2023
2	Handbook of Nutraceuticals Volume I Ingredients	Yashwant V. Pathak	CRS Press	2009

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	https://onlinecourses.swayam2.ac.in/ugc19_hs33/preview
2	https://nptel.ac.in/courses/126105023
3	https://onlinecourses.swayam2.ac.in/ugc19_hs33/preview
4	https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/290

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