

NUTRACEUTICALS AND FUNCTIONAL FOODS (SELF STUDY)

Semester	Subject Code	Category	Lecture	Theory	P	C
III	POCBT3SS	Self Study	0	0	0	2

COURSE OBJECTIVE: In this course, students will

- Understand the basic concepts of nutraceuticals and functional foods, nutraceuticals of various origins. Concept of prebiotics, probiotics, synbiotics, free radicals and antioxidants.

COURSE OUTCOMES: Up on successful completion of course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL (K2-K6)
CO1	Understand the basic of nutraceuticals and functional foods	K2
CO2	Understand various types of nutraceuticals of plant and animal origin	K2
CO3	Analyze and application of various nutraceuticals in day-to-day life	K3 & K4
CO4	Analyze the role of nutraceuticals in industry	K4
CO5	Apply knowledge for the development and evaluation of products and clinical trials	K3& K5&K6

Knowledge level: K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

MAPPING WITH PROGRAM OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	M	M
CO2	S	S	M	M	M	M
CO3	M	M	S	M	S	M
CO4	M	M	S	S	M	M
CO5	M	S	M	S	S	S

S-strong; M- medium; L-low

UNIT I: INTRODUCTION TO NUTRACEUTICALS

Historical perspective, definition, classification, scope and future prospects of nutraceuticals and functional foods. Organizational elements, dietary supplements, fortified foods. Understanding benefits of functional foods and nutraceuticals.

UNIT II: NUTRACEUTICALS OF PLANT AND ANIMAL ORIGIN

Plant secondary metabolites, classification and sub-classification- alkaloids, phenols, terpenoids, flavonoids- extraction, purification and application with specific example. Animal metabolites- sources and extraction of nutraceuticals of animal origin (chitin).

UNIT III: MICROBIAL AND ALGAL NUTRACEUTICALS

Concept of prebiotics and probiotics- principle, mechanism, production and application. Bacteria as probiotics, Prebiotics in maintaining useful microflora. Synbiotics in good health. Probiotics in various foods.

UNIT IV: BIOTECHNOLOGY IN PHYTONUTRACEUTICALS

Role of medicinal & aromatic plants in nutraceutical industry- propagation, conventional and tissue culture, cultivation, post harvest technology and strategies for crop improvement. Plant genomics and metabiomics. Introduction to nanobiotech with reference to nutraceuticals.

UNIT V: PRODUCT DEVELOPMENT AND CLINICAL TRIAL

Product development and clinical trial: Activity screening, formulation, toxicology tests- MTT Assays, Cell viability assays. Bioavailability and bioequivalence studies, use of animal models and pre-clinical and clinical trial involved.

TEXT BOOKS:

S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Robert E C Wildman	Handbook of Nutraceuticals and Functional foods	CRC Press	2016
2.	Israel Goldberg	Functional Foods: Designer foods, Pharma foods, Nutraceuticals	Springer Science & Business media	1994
3	Edward R	CRC Press	Handbook of Fermented functional foods	2013
4	Liangli L. Yu and RongTsao	Cereals and Pulses:Nutraceutical Properties and health benefits	Wiley Press	2012

5.	Mary K. Schmidl	Essentials of functional foods	Springer Science & Business Media	2000
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S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Robert E.C.	Handbook of Nutraceuticals and functional foods, third edition,	Wildman	2000
2.	Debasis Bagchi	Biotechnology in Functional foods and Nutraceuticals	Francis C. Lau	2010
3	Dilip Ghosh,	Clinical aspects of Functional foods and Nutraceuticals	CRC press.	2012
4	Robert EC Wildman	Handbook of nutraceuticals and functional foods	CRC press.	2006
5.	Vijay Kumar Gupta	Microbial functional foods and nutraceuticals	John Wiley & Sons Ltd	2018

WEB SOURCES:

1. <https://www.crcpress.com/authors/i326-dilip-ghosh>
2. https://books.google.co.in/books/about/Handbook_of_Nutraceuticals
3. https://books.google.com/books/about/Handbook_of_Nutraceuticals
4. <https://www.sciencedirect.com/journal/food-research-international>
5. <https://booksofdirectory.com/docs/functional-foods>
6. <http://scitechconnect.elsevier.com/nutraceutical-food-components-author-acknowledgments>

Syllabus Designer:

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