DEPARTMENT OF BOTANY				*CLASS: I PG*				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
II	Non-Major Elective-2	21P2BNM2	Food Science and Nutrition	2	2	25	75	100

Nature of Course				
Knowledge and skill	✓		Employability oriented	
Skill oriented			Entrepreneurship oriented	

Course Objectives

The course will enable the students to

1. familiarize themselves with an overview of food components, cooking methods andutensils and their advantages and disadvantages,
2. assess food safety laws and standards,
3. acquire basic knowledge on various flavors, additives, colorants and pigments sources,
4. promote the traditional healthy recipes and their positive impact on health system and
5. identify and aware of the bioavailability of nutrients as well the ongoing nutritional transition and their implications.

UNIT	CONTENT	CLO	K LEVEL	HOURS
I	Introduction – Food – Food Science – Nutrition – Nutrients and Nutritional Status. Role of carbohydrates, proteins, fats, minerals, vitamins, water and antioxidants. Advantages of cooking utensils – Earthenware, Stainless steel, Iron and Aluminum.	**1**	**Up to K2**	**6**
II	Food safety laws and standards. International Organization for Standardization (ISO). Bureau of Indian Standards (BIS) and AGMARK. Prevention of Food Adulteration Act (PFA).	**2**	**Up to K2**	**6**
III	Flavors - Taste and nonspecific saporous sensations, vegetable, fruit and spice flavor. Food additives - Acid, bases, buffer systems, chelating agent, antimicrobial agent and sweeteners. Natural and artificial food colorants. Pigments from animal and plant tissues.	**3**	**Up to K2**	**6**
IV	Interactions of nutrition, immunity and infection, food allergies and intolerance, food toxicity, naturally occurring toxicants in food. Preparations of some nutrient rich recipes; ulundankali, raagithithipal, kambu porridge, sesame balls, peanut chikkes.	**4**	**Up to K2**	**6**

V	Bioavailability of nutrients. Nutrient losses during cooking and processing. Changing trends in life style patterns duet to change in food habits and sleep pattern among the present generation. Nutrigenomics, nutraceuticals and bioactive compounds. Awareness of ongoing nutritional transition and its implications.	**5**	**Up to K2**	**6**

Text Books:

1. Subhangini A Joshi. 1992. Nutrition and Dietetics. Hill Publishing Company.
2. Srilakshmi, B. 2018. Food Science. New Age International Publishers.
3. Srilakshmi, B. 2010. Food Science and Nutrition. New Age International Publishers.
4. SunetraRoday. 2012. Food Science and Nutrition. Oxford Publishers.
5. Deepak Mudgil and Sheweta Barak Mudgil. 2015. Objectives of Food science and Technology. Scientific publishers.

Reference Books:

1. Fellows P. J (2002). Bureau of Indian standards: Specifications and standard methods. Volume I to XII. Food Processing Technology- Principles and Practices, 2nd Edition. Woodhead Publishing Ltd.
2. Food and Agriculture Organization. (1980). Manual of Food Quality Control. Additive Contaminants Techniques. Rome.
3. Graf E and Saguy I S, (1991). Principles and practices for the safe processing of foods. Butterw Heinemann Ltd., Oxford.
4. Mahindru, S N (2000). Food Additives- Characteristics Detection and Estimation. Tata Mc Graw Hill Publishing Co. Ltd.
5. ICMR (1990). Nutrient Requirements and Recommended Dietary Allowances for Indians. FAO/WHO/UNU (2004).
6. Nutrition in Developmental Transition. NFI-WHO (SEARO) Symposium. NFI (2006).

Web Resources:

1. https://www.nin.res.in/
2. https://www.nutritionfoundationofindia.res.in/
3. https://www.myindiandietitian.com/
4. https://www.springer.com/journal/13197/
5. https://www.foodandnutritionjournal.org/

Rationale of the Course:

The course helps the students to gain the basic understanding of food and nutritional needs from birth to adulthood, by providing the necessary theoretical background.

Activities having direct bearing on Skill development / Employability / Entrepreneurship

The knowledge gained through this course will help the students to change their life style to healthy food and sleep habits so as to ensure their physical and mental well-being.

Pedagogy:
Chalk and Talk, PPT, You tube videos, Group Discussion, Seminar, Interaction and Quiz.

Course Learning Outcomes:

CLOs	CLO Statement	Knowledge Level
Students will be able to know, and understand		
CLO-1	the facts about food and cooking utensils	**Up to K2**
CLO-2	the food safety laws and standards	**Up to K2**
CLO-3	the information to analyze and be aware of food stuff	**Up to K2**
CLO-4	the traditional and junk food and their impact on health	**Up to K2**
CLO-5	the information for healthy life	**Up to K2**

Mapping Programme Specific Outcomes with Course Learning Outcomes:

	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5
CLO-1	3	-	-	-	-
CLO-2	2	-	-	-	-
CLO-3	3	-	-	-	-
CLO-4	2	-	-	-	-
CLO-5	3	-	-	-	-

3 – Advance application 2 – Intermediate level 1 – Basic level

Lesson Plan

Unit	Description	Hours	Mode
I	a) Introduction – Food – Food Science – Nutrition – Nutrients and Nutritional Status. b) Carbohydrates, proteins,fats, minerals vitamins, water and antioxidants c) cooking utensils	2 2 2	Chalk and talk PPT and You tube videos
II	a) Food safety laws and standards b) International Organization for Standardization (ISO). c) Bureau of Indian Standards (BIS), AGMARK. d) Prevention of Food Adulteration Act (PFA).	1 1 2 2	Chalk and talk PPTand You tube videos
III	a) Flavors: Taste and nonspecific saporous sensations. b) vegetable, fruit and spice flavor c) Food additives: Acid, bases, buffer systems, chelating agent, antimicrobial agent and sweeteners d) Natural and artificial Food colorants e) Pigments from animal and plant tissues.	1 1 2 1 1	Chalk and talk PPT and You tube videos
IV	a) Interactions of Nutrition, Immunity and Infection b) Food allergies and intolerance, food toxicity c) Naturally occurring toxicants in food d) Preparations of some nutrient rich recipes; ulundankali, raagithithipal, kambu porridge, sesame balls, peanut chikkes.	2 1 1 2	Chalk and talk PPTand Group discussion
V *****	a) Bioavailability of nutrients. Nutrient losses during cooking and processing. b) Changing trends in life style patterns with special emphasis on sleep pattern (Sleep) among present generation. c) Nutrigenomics, nutraceuticals and bioactive compounds. d) Awareness of ongoing nutritional transition and its implications. **All the lecture topics will have relevant video animations to make the class interesting and effective.**	2 2 1 1	Chalk and talk PPT and You tube videos
	Total	**30**	

Course Designer**: Dr. S. Gnaana Saraswathi,** Assistant Professor**.**

Learning Outcome Based Education & Assessment (LOBE)
Blue Print – PG BOTANY NME FORMATIVE EXAMINATIONS (CIA-I & II)
Articulation Mapping – K Levels with Courses Learning Outcomes (CLOs)

CLOs	K- Level	Section A		Section B		Section C	
		Short Answers		(Either/or Choice)		(Open Choice)	
		No. of Questions	K- Level	No. of Questions	K- Level	No. of Questions	K- Level
CLO x	Up to K2	1	K1	1	K2/K2	1	K1
CLO y	Up to K2	2	K1	1	K2/K2	2	K1
No. of Questions to be asked		3		2		3	
No. of Questions to be answered		3		2		2	
Marks for each question		2		7		10	
Total Marks for each section		**6**		**14**		**20**	

Learning Outcome Based Education & Assessment (LOBE)
Blue Print – PG BOTANY NME - SUMMATIVE EXAMINATIONS

Units	CLOs	K- Level	Section A		Section B		Section C
			Short Answers		Paragraph (Either/or Choice)		Essay
			No. of Questions	K- Level	No. of Questions	K- Level	
1	CLO 1	Up to K2	2	K1 & K1	2	1 K2	1 K1
2	CLO 2	Up to K2	2	K1 & K1	2	1 K2	1 K1
3	CLO 3	Up to K2	2	K1 & K1	2	1 K2	1 K1
4	CLO 4	Up to K2	2	K1 & K1	2	1 K2	1 K1
5	CLO 5	Up to K2	2	K1 & K1	2	1 K2	1 K1
No. of Questions to be asked			10			10	5
No. of Questions to be answered			5			5	3
Marks for each question			2			7	10
Total Marks for each section			10			35	30

Distribution of Section-Wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (No Choice)	Section C (No Choice)	Section D (No Choice)	Total Marks	% of Marks (without choice)	Consolidated
K1	10	-	50	-	60	46.15	100
K2	-	70	-	-	70	53.85	
K3	-	-	-	-	-	-	-
K4	-	-	-	-	-	-	-
Total Marks	**10**	**35**	**50**	**-**	**130**	**100.00**	**100**