



**University of Kerala**

Discipline	<b>BOTANY</b>				
Course Code	<b>UK4DSEBOT202</b>				
Course Title	<b>FOOD SCIENCE AND QUALITY CONTROL</b>				
Type of Course	<b>DSE</b>				
Semester	<b>IV</b>				
Academic Level	<b>200 - 299</b>				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	04	03 Hours	-	02 Hours	05 Hours
Pre-requisites	No Pre-requisites				
Course Summary	This course is designed to provide a comprehensive understanding of the principles and practices involved, and maintaining quality control standards in food production. The course covers topics ranging from sources of nutrients in nature to food safety regulations and quality assurance techniques. Students will gain practical skills through laboratory sessions and case studies, preparing them for roles in food production, quality control, and regulatory compliance.				

**Detailed Syllabus:**

Module	Unit	Content	Hrs
<b>I</b>	<b>The food – Composition and constituents</b>		<b>06</b>
	1	Introduction and scope of Food Science	
	2	Composition of food: Carbohydrates- Major sources and functions. Proteins-Majorsources and functions. Lipids-Saturated and unsaturated fatty acids- Dietary functions of fats.	
	3	Minerals- Calcium, Phosphorus, Magnesium, Sodium, Potassium, Zinc Vitamins- fat soluble and water soluble- Enzymes- Amylase, Protease, Lipoxxygenase, Pectic enzymes, Lipase - Pigments- Chlorophylls, Carotenoids, Anthocyanin.	
<b>II</b>	<b>Classification of foods, food additives and food-borne health complications</b>		<b>07</b>
	4	Types of food- Nutraceuticals, Probiotics, Prebiotics, GM food, Organic food, Traditional foods, Fermented foods	
	5	Food additives: Food colours, Sweeteners, Gelling agents, Flavour enhancers, Surface acting agents, Bleaching agents, Stabilizers, and thickeners	
	6	Foodborne illness and diseases: Food poisoning, Botulism, Ergotism, Staphylococcal intoxication, Mycotoxicosis	
		<b>Food adulteration</b>	<b>06</b>

<b>III</b>	7	Food adulteration: Definition, Common adulterations in food, Reasons for adulteration.	
	8	Testing adulteration: in milk, ghee, tea, coffee, chilly powder, turmeric powder, Honey-Harmful effects of food adulteration.	
<b>IV</b>	<b>Food preservation techniques</b>		<b>11</b>
	9	Food spoilage: reasons for food spoilage, Physical and Chemical changes in food that affect texture, flavour, odour, stability and nutritive value during processing and storage.	
	10	Food preservation methods: Asepsis, Removal of microorganisms, Drying, Smoking, Low temperature, High temperature, Canning, Vacuum filling, UV radiation, Lyophilization, Nitrogen packaging.	
	11	Food Preservatives: Salt, Vinegar, Sugar, Benzoates, Sorbates, Nitrates, Propionates, Antioxidants, Antibiotics, Antifungal preservatives	
<b>V</b>	<b>Quality control in mechanisms in Food industries</b>		<b>15</b>
	12	Quality control (QC) in the food industry, major concepts of QC, Significance	
	13	Food safety Standards and Regulations-ISO 22000, HACCP, FSSAI, GMP, AGMARK	
	14	Quality control activities and Inspection, Certification, and Testing laboratories	

<b>Practicals</b>		
	<ol style="list-style-type: none"> <li>1. Activity: Carry out a market survey of additives used in different types of foods, classify them based on their role, and present your findings as ppt (p)</li> <li>2. Hands-on training on Adulteration testing of milk, chilly powder, and tea: Brands available in the market. Prepare a report (p)</li> <li>3. Activity: Familiarize with different preservation methods employed for the preservation of vegetables, fruits, cereals, and pulses- Submission of the report (p)</li> <li>4. Visit any Food industry/Food processing unit that follows food safety standards and regulations and submit a report (p)</li> </ol>	<b>30</b>

### Suggested Reading

1. Adams, M.R.& Mass, M.D. 2008. Food Microbiology, New Age International Pvt Ltd.
2. Banwart, G.T.2017. Basic Food Microbiology, 2nd edition, CBS Publications, New Delhi ISBN-13 978-8123906461.
3. Black, J.G.1999. Microbiology Principles and Exploration, 4th Edition. John Wiley and Sons Inc. ISBN-13 978-0471377320
4. Frazier, W.C. (1989). Food Microbiology. 4th Edition, McGraw Hill Education. ISBN- 13 978-0071004367
5. Grumezescu, A. M., & Holban, A. M. (2017). Microbial Contamination and Food Degradation. Academic Press.

## Reference

1. Lara, W.2019. Food Science and Quality Control ED Tech press, ISBN-978-1-83947-260  
Liu, D.2018.Handbook of Foodborne diseases. CRC Press
2. Longree.1972. Quantity Food Sanitation. John Wiley & Sons, ISBN-13 978- 0471544463

### Course Outcomes

No.	Upon completion of the course the graduate will be able to	Cognitive Level	PSO addressed
CO-1	Identify the food components and issues relevant to food processing and food quality management systems.	U	PSO-1,2
CO-2	Discuss the spoilage and deterioration mechanisms in foods and methods to control spoilage.	R, U	
CO3	Classify the food preservatives based on risk and benefit basis	An	
CO4	Employ the principles of food science in practical, real-world situations and Predict the consequences of excess use of additives.	E	
CO5	Budget the cost of implementing food safety standards and regulations for a small-scale unit.	C	PSO-6,8

R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create

**Name of the Course: Food Science and Quality control**

**Credits: 3:0:1 (Lecture:Tutorial:Practical:)**

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/Tutorial (T)	Practical (P)
1	1	1,2	U	F, C	L, T	
2	2		R, U	P	L, T	P
3	3		An	F, C	L, T	p
4	4		E	P	L, T	
5	5	6,8	C	P	L, T	

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

**Assessment Rubrics:**

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

**Mapping of COs to Assessment Rubrics :**

	<b>Internal Exam</b>	<b>Assignment</b>	<b>Project Evaluation</b>	<b>End Semester Examinations</b>
CO 1	✓			✓
CO 2	✓			✓
CO 3	✓			✓
CO 4		✓		✓
CO 5		✓		✓