

CATERING SCIENCE**Course Code : 322319****Programme Name/s : Hotel Management & Catering Technology****Programme Code : HM****Semester : Second****Course Title : CATERING SCIENCE****Course Code : 322319****I. RATIONALE**

The subject aims to develop knowledge and skills in application of science in culinary arts. It also makes students to understand role of nutrients which includes basic Food groups, food preservation techniques, food storage techniques, and food microbiology, It also introduces food regulation acts and their implementation in various food and catering units.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

The aim of this course is to help the student to attain the following industry identified outcomes through various teaching learning experiences: Adopt good hygiene practices to produce and serve safe and healthy food

III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Plan a balance meal using different food groups.
- CO2 - Identify the adulterants present in common food items and illustrate use of traditional and modern additives in cooking.
- CO3 - Apply the principles of microbial growth in preparation of various foods and beverages.
- CO4 - Illustrate traditional and modern methods of food preservation and analyse importance of temperature control in proper storage of food.
- CO5 - Implement healthy practices for food handling to prevent food contamination during food preparation and serving.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH	Paper Duration		Theory			Based on LL & TL				Based on SL			
				CL	TL	LL					Total	Practical		SLA							
							FA-TH	SA-TH				Max	Min	Max	Min	Max	Min	Max	Min		
322319	CATERING SCIENCE	CSC	DSE	3	-	-	1	4	2	3	30	70	100	40	-	-	-	-	25	10	125

Total IKS Hrs for Sem. : 5 Hrs

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Describe the importance of catering science, TLO 1.2 Describe the concepts in colloidal chemistry, TLO 1.3 State the functions of food TLO 1.4 Illustrate healthy traditional Indian thali as a balanced meal.	Unit - I Introduction to Catering Science and Nutrition 1.1 Catering Science in the Hospitality Industry. 1.2 Colloid Chemistry of Food Science :- Types of colloids in food (Sol, Gel, Emulsion, Foam), Colloidal food examples. 1.3 Functions of Food: Physiological Function, Psychological Function, Sociological Function 1.4 Concept of Nutrition: Define, Nutrition, Nutrients, Classification of Food- Nutritional Classification of Foods, Food Groups- 5 food group, 7 food group classification. My Food Plate- Example from Nutritionally balanced Traditional Maharashtrian Thali. (IKS) Effect of heat and processing on nutrients in different food groups- Rancidity of fats.	Chalk-Board Presentations Improved Teaching Methods

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Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
2	<p>TLO 2.1 Enumerate the common adulterants in the given food items.</p> <p>TLO 2.2 Classify food additives</p> <p>TLO 2.3 Comparison traditional and modern food additives used in cooking</p> <p>TLO 2.4 Select Food additives for enhancing texture of flavour of foods</p>	<p>Unit - II Food Adulteration and Food Additives</p> <p>2.1 Food Adulteration- Definition of Food Adulteration Common food adulterants present in food items and methods of detecting food adulterants in: Milk, Sugar, Tea, Coffee Powder, Flour, Semolina, Turmeric, Chilli Powder, Ghee, Butter. Prevention of Food Adulteration Act</p> <p>2.2 Traditional and modern ways of using food Food Additives in cooking - a) Classification of Food additives: Intentional and Incidental. b) Importance and use. c) Types of additives – Traditional and Modern. (Thickening, Stabilizing, Emulsifying agents, Colouring agents- Natural (IKS) and Synthetic, Flavour enhancers) d) Indian Herbs and Spices used as flavour. (IKS). Artificial flavour enhancers</p>	<p>Chalk-Board Presentations Site/Industry Visit Improved teaching methods</p>
3	<p>TLO 3.1 Implement the concept of microbiology and use of microorganisms in food Industry.</p> <p>TLO 3.2 Enlist the microorganisms used in food and beverage preparation</p> <p>TLO 3.3 Elaborate on safety practices to prevent microbial growth during cooking and storage of food.</p> <p>TLO 3.4 Explain the various factor affecting the growth of Microorganism in food.</p>	<p>Unit - III Food Microbiology and Food Spoilage</p> <p>3.1 Food Microbiology, Application of Microbiology in food industry , Microorganisms in Food - Classification of microbes, beneficial and harmful microbes, Factors affecting growth of microorganisms, Danger Zone, list of microorganisms used in food and beverage preparation - (vinegar, cheese, buttermilk, yogurt, miso, pickle beer, wine, rum), Classification of Food based on shelf life</p> <p>3.2 Spoilage causing microorganisms in food, Precautions to be taken while cooking of food, storing leftovers, reheating and freezing or refrigerating the food, Methods of controlling microbial growth-FATTOM(food, acidity, time, temperature, oxygen, moisture), cross contamination.</p>	<p>Chalk-Board Presentations Site/Industry Visit Flipped Classroom</p>
4	<p>TLO 4.1 Describe various methods of food preservation</p> <p>TLO 4.2 Elaborate the concept of Cold and dry storage and food rotation to prevent food spoilage.</p>	<p>Unit - IV Food Preservation and Food Storage</p> <p>4.1 Food Preservation : Basic principles of Food Preservation, Methods of Food preservation Traditional Methods of Preservation: (IKS) 1. Sun drying 2. Pickling 3. Smoking, Modern Methods of preservation: 1. Refrigeration, Freezing 2. Pasteurization, Canning. 3. Artificial Additives 4. Irradiation 5. Vacuum packing, 6. UHTS(Ultra High Temperature Sterilization) 7. Aseptic packaging.</p> <p>4.2 Food Storage Types of storage areas and ideal temperature for storage of different food items Cold Storage- Temperature control, Correct use of refrigerator and freezer.</p>	<p>Chalk-Board Presentations Video Demonstrations</p>

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Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	TLO 5.1 Describe the various sources of food contamination during food production and service. TLO 5.2 Illustrate the hygienic practices for food handling to prevent food contamination during food preparation and service. TLO 5.3 Validate the importance of Food Safety Management System in Food Service Establishment.	Unit - V Food Contamination and Food Safety 5.1 Food Contamination Cause of Food Contamination during food production and food service. Food Poisoning and Food Infection 5.2 Hygienic practices for food handling to prevent food contamination during food preparation and serving. 5.3 Food Safety Management System in Food Service Establishment Food Safety Act Hazard Analysis and Critical Control Point (HACCP) Food Hazards and its sources Principle of HACCP Benefits of implementing HACCP	Chalk-Board Presentations Site/Industry Visit Video Demonstrations

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES : NOT APPLICABLE.**VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)****Assignment**

- Conduct market survey to identify mis-branded products kept in grocery stores.
- Submit the report on common additives used in readymade products convenience food.
- Design a poster on HACCP principles for food industry(Hotels and Restaurants).

Micro project

- In group of five students each prepare sol, gel, emulsion , foam, identify the browning desirable and undesirable reactions in these foods, take pictures and make powerpoint presentation.
- Carry out adulteration test on 10 different food ingredients used in cooking, and prepare the report.
- Experiment in kitchen in groups the effect of heat at different temperature on the nutrients.Select three items from each nutrients group and apply two methods on each food items and record the findings
- Experiment with five food product keeping in danger zone and observe the growth of microorganisms time and temperature and monitor through out and submit the recorded results.
- Visit your nearest market and prepare a report on FSSAI registration/ licence in food outlets, grocery shops, kiosks, etc.
- Prepare a skit to spread awareness about HACCP principles for street food vendors and upload on social media.
- Make an informative video on production of milk products like curd, buttermilk, paneer, and ghee.
- Prepare scrapbook on various nutrients found in plant base and animal base food groups.

NA

- Visit milk dairy in your local city to observe pasteurisation and present report.
- NA
- Visit canned product industry and present a report.
- Design a poster on good manufacturing practices and good hygiene practices display in practical laboratories.

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Team work : a. Make a Folio of types of colloids used in Indian cuisine.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	NOT Applicable	All

IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Introduction to Catering Science and Nutrition	CO1,CO3	6	6	4	0	10
2	II	Food Adulteration and Food Additives	CO2	7	2	4	4	10
3	III	Food Microbiology and Food Spoilage	CO3,CO4,CO5	11	2	4	10	16
4	IV	Food Preservation and Food Storage	CO4,CO5	10	2	4	10	16
5	V	Food Contamination and Food Safety	CO3,CO4,CO5	11	8	4	6	18
Grand Total				45	20	20	30	70

X. ASSESSMENT METHODOLOGIES/TOOLS**Formative assessment (Assessment for Learning)**

- NOT APPLICABLE
- NA

Summative Assessment (Assessment of Learning)**XI. SUGGESTED COS - POS MATRIX FORM**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	2	3	-	-	-	-	2			
CO1	2	3	-	-	-	-	2			
CO2	2	2	-	-	1	3	2			
CO2	2	2	-	-	1	3	2			
CO3	2	2	1	-	2	-	1			

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CO3	2	2	1	-	2	-	1			
CO4	2	2	1	-	-	-	1			
CO4	2	2	1	-	-	-	1			
CO5	1	3	3	-	1	2	3			
CO5	1	3	3	-	1	2	3			

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*PSOs are to be formulated at institute level

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Roday Sunetra	Food Hygiene and Sanitation	Oxford University Press, New Delhi ISBN-978-0070700208
2	M. Swaminathan	Hand book of Food & Nutrition	Bappco - ISBN-13 978-8120417953
3	W. C. Frazier , D. D. Westhoff	Food Microbiology	Tata Mc Graw-Hill Publishing Co. Ltd ISBN -9780070219175
4	J.A. Stretch & H.A. Southgate	The Science of Catering	Edwards Arnold. ISBN-13. 978-0713174311
5	Asmita Thaokar, & Sumitra Deshmukh	Catering Science and Food Safety	Apex Global Publishers ISBN: 9781405487757
6	Roday Sunetra	Food Hygiene and Sanitation	Tata Macgraw Hill, New Delhi ISBN-13 ?978-0070700208

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://www.sciencedirect.com	ScienceDirect is the world's leading source for scientific, technical, and medical research. Explore journals, books and articles.
2	https://www.fssai.gov.in	Food Safety and Standards Authority of India (FSSAI) is a statutory body established under the Ministry of Health & Family Welfare, Government of India.[4] The FSSAI has been established under the Food Safety and Standards Act, 2006, which is a consolidating statute related to food safety and regulation in India. [5][4] FSSAI is responsible for protecting and promoting public health through the regulation and supervision of food safety.
3	https://asianhotelandcateringtimes.com/	Asia's most respected and reliable hospitality industry magazine. In-depth coverage of industry news, food & beverage trends
4	https://www.foodhospitality.in/	Express Food & Hospitality Publication is the most reliable source of information for the Indian hospitality industry

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Semester - 2, K Scheme