SEMESTER S6

BEVERAGE PROCESSING

Course Code	**PEFTT632**	**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)	Nil	**Course Type**	Theory

Course Objectives:

1. To develop the knowledge of students on various concepts, procedures and manufacturing of different beverages.
2. To understand the quality control and quality assurance systems in beverage processing industry

SYLLABUS

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Module No.	Syllabus Description	Contact Hours
1	**Basic Ingredients in Beverages:** Beverage definition-ingredients-water, CO2, Bulk and Intense Sweeteners, Water Miscible and Water dispersible flavouring agents, Colours-natural and artificial, micro and nano emulsions of flavours and colours in beverages, Preservatives, Emulsifiers and Stabilizers, FSSAI standards for beverages, quality control analysis for beverages	9
2	**Beer and Wine Manufacture:** Ingredients-Malt, Hops-adjuncts-water, yeast. Beer manufacturing process-malting, preparation of sweet wort, brewing, fermentation, pasteurization and packaging. Beer defects and spoilage. Wine fermentation-types-red and white. Wine defects and spoilage	9
3	**Manufacture of Distilled Fermented Beverages:** Malt and Grain, Whisky-types, raw materials and processing. Design-wash still operation-spirit still operation-continuous distillation-design and operation of grain whisky stills-maturation and blending- co products. Whiskies of the world and their regulations	9

4	**Carbonated and Non-carbonated Beverages:** Procedures - Carbonation equipment - ingredients, preparation of syrups - filling systems - packaging - containers and closures. Coffee bean preparation-processing-brewing-decaffeination-Instant Coffee-Tea-types-Black, Green and oolong. Dairy based beverages. Fruit juices, Nectar, Squash, RTS beverages and Isotonic Beverages. Flash Pasteurization, Canning and Aseptic packaging of beverages	**9**

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

Continuous Internal Evaluation Marks (CIE):

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

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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	To study the basic ingredients of beverages and classification	**K3**
CO2	To study the process techniques and equipment used for the beer and wine manufacture	**K3**
CO3	To study the process techniques and equipment used for the manufacture of distilled fermented beverages	**K3**
CO4	To study the process techniques and equipment used for carbonated beverages	**K3**
CO5	To study the quality parameters of beverages	**K3**

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	3	3	2	2								
CO3	3	3	2	2								
CO4	3	3	2	2								
CO5	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	Chemistry and Technology of Soft Drinks and Fruit Juices.	Ashurst,P.R	Blackwell Publishing, 2005.	2nd Edition, 2005
2	Carbonated soft drinks-Formulation and Manufacture	Steen,D.P and Ashurst,P.R,	Blackwell Publishing, 2000.	Blackwell Publishing, 2000.
3	Food-Facts and Principles	Shahkunthala Manay,V and Shadakdharaswamy,M,	", New Age International Pvt. Ltd, 3	3Revised Edition,2000.

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Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Handbook of post-harvest technology.	Amalendu Chakraverty et al,	Ed: Marcel Dekker Inc, (Special Indian Edition), 2000.	Special Indian Edition2000.
2	Microbiology and Technology of fermented Foods.	Robert W Hukins,	IFT Press, Blackwell Publishing Ltd	2006.
3	Food, Fermentation and Microorganisms	Charles,W, Bamforth	Blackwell Science Publishing Ltd	2005
4	” Whisky-Technology, production and marketing”,	Inge Russel, Graham Stewart and Charlie Bamforth,	Elsevier	2003

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	https://nptel.ac.in/courses/126105023
2	https://onlinecourses.swayam2.ac.in/cec19_ag01/preview
3	https://elearn.nptel.ac.in/shop/nptel/dairy-and-food-process-and-products-technology/?v=c86ee0d9d7ed
4	

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