

**DISCIPLINE SPECIFIC ELECTIVE COURSE**  
**DSE FT 05: SENSORY SCIENCE**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit Distribution of the Course			Eligibility Criteria	Pre-requisite of the Course (if any)
		Lecture	Tutorial	Practical		
Sensory Science <b>DSE FT 05</b>	4	3	0	1	Studied <b>XII</b>	Nil

**Learning Objectives**

1. To appreciate the significance of sensory science in food product designing and development.
2. To understand the physiology and mechanism of taste, aroma, texture and colour perception.
3. To study the various instrumental techniques/ measurements used in evaluating sensory attributes of food.

**Learning Outcomes**

- Apply the principles of sensory science in product development, reformulation and optimization, packaging, storage, and studies on alternative of foods.
- Assess colour, flavour, texture, and other sensory characteristics of food for quality assurance.
- Evaluate consumer perception and acceptance of food products.

**SYLLABUS OF DSE FT 05**

**THEORY**  
**(Credit 2; Hours 30)**

**UNIT I: Gustation**

**8 Hours**

Unit description: This unit will focus on the physiology of taste, its perception and evaluation techniques.

- Introduction and importance of gustation
- Structure and physiology of taste organs- tongue, papillae, taste buds, salivary glands

- Mechanism of taste perception
- Chemical dimensions of basic tastes- sweet, salt, sour, bitter and umami
- Factors affecting taste quality, reaction time, taste modification, absolute and recognition threshold
- Recent advances in Taste measurement- Electronic Tongue
- Taste abnormalities

**UNIT II: Olfaction** **7 Hours**

Unit description: This unit will focus on the physiology of smell, its perception and evaluation techniques.

- Introduction, definition and importance of odour and flavour.
- Anatomy of nose, physiology of odour perception
- Pre-requisites of odour perception.
- Mechanism of odour perception
- Recent advances in olfaction measurement – Electronic Nose
- Olfactory abnormalities

**UNIT III: Colour** **7 Hours**

Unit description: This unit will focus on the importance of colour, its perception and evaluation techniques.

- Introduction and importance of colour
- Dimensions of colour.
- Attributes of colour; gloss etc.
- Perception of colour
- Colour Measurement: Hunter colour system, Tintometer.
- Colour abnormalities

**UNIT IV: Texture** **8 Hours**

Unit description: This unit will focus on texture, its significance, physiology, and measurement.

- Introduction, definition, and importance of texture.
- Significance of sound in texture evaluation
- Physiology of Sense of Touch
- Texture perception
- Phases of oral processing.
- Receptors involved in texture evaluation.
- Texture measurement – basic rheological models, forces involved in texture measurement.

**PRACTICAL**  
**(Credit 2, Hours 60)**

1. Training of sensory panel.
2. To perform recognition tests for basic tastes.

3. To perform various Analytical tests
  - a. Discriminative Tests: Simple and directional Difference tests, Ranking and Rating Tests.
  - b. Sensitivity Tests: Threshold, /Dilution for basic tastes
  - c. Descriptive Tests: Category Scaling (structured and unstructured) Quantitative Descriptive Analysis.
4. To perform Affective Tests (Preference and Acceptance Tests)
  - a. Hedonic Scale (verbal, facial)
  - b. Food Action Scale
5. Perform sensory evaluation of any dairy product-market milk/cheese/butter/ice cream.
6. Analyze flavour defects in milk/ ice-cream/ butter.
7. Colour measurement using Lovibond Tintometer/ Hunter Colour Lab.

### **Essential Readings**

- Rao, E. S. (2013). Food Quality Evaluation (1 ed.). Variety Book Publishers, New Delhi.
- Herbert S., Rebecca B., & Heather T. (2020) (5<sup>th</sup> ed.) *Sensory Evaluation Practices*. Elsevier.
- Meilgard (2014). Sensory Evaluation Techniques (3rd ed.). CRC Press LLC.

### **Suggested Readings**

1. George, A. B. (2004). Fenaroli's Handbook of Flavor Ingredients (5th ed.). CRC Press
2. Harry, T. L. & Barbara, P. K. (1991) Sensory Science Theory and Applications in Food. New York: Marcel Dekker.
3. Morton, I. D. & Macleod, A. J. (1990). Food Flavours. *Part A, B & C*. Elsevier.
4. Rao, E. S. (2014). Food Quality Testing and Evaluation: Sensory Tests and Instrumental Techniques. New Delhi. Variety Book Publishers

**Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**