

**DISCIPLINE SPECIFIC CORE COURSE****DSC FT 17: Food Chemistry II****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)
		Theory	Tutorial	Practical/Practice		
Food Chemistry II	4	3	0	1	XII Pass with PCM/PCB	Nil

**Learning Objectives**

- To understand the chemistry of food components and their interactions.
- To know about the role of enzymes and its application in food industry.
- To co-relate the quality changes during different processing methods of food.
- To understand the concept of new food product development.

**Learning Outcomes**

After completing this course, students will be able to:

- Determine approaches that may be used to control the reactivity of those food components that are likely to impact the overall quality of finished products.
- Interpret the reasoning of changes occurring in food during different processing treatments.
- Learn basic methods of food product development.

**THEORY**

**Credits: 3; Hours:45**

**Unit I: Sensory Aspects (Colour & Flavour)****Natural Food Pigments**

**6 Hours**

- Introduction and classification
- Food pigments (Sources, Structure, Stability and Interactions)

- Chlorophyll
- Carotenoids
- Anthocyanins and flavonoids
- Beet pigments
- Myoglobin

#### **Flavour**

**5 Hours**

- Definition and basic tastes
- Chemical structure and taste
- Description of food flavours , Flavour enhancers

#### **Unit II : Enzymes**

**10 Hours**

- Introduction, classification
- General characteristics
- Enzymes in food processing
- Industrial Uses of Enzymes
- Immobilized enzymes

#### **Unit III: Changes occurring during food processing treatments.**

##### **Physico-chemical and nutritional changes occurring during food processing treatments**

**9 Hours**

- Drying and dehydration
- Irradiation
- Freezing
- Canning

#### **Browning Reactions In Food**

**7 Hours**

- Enzymatic browning
- Non – Enzymatic browning:
- Maillard reaction
- Caramelization
- Ascorbic acid oxidation

#### **Unit IV: New Food product development**

**8 Hours**

- Definition
- Importance
- Need of product development
- Stages of product development
- Product development tools
- Reasons for failure
- Product Life Cycle

### **PRACTICAL**

**Credit: 1; Hours: 30**

1. Determination of thermal inactivation time of spoilage enzymes (Blanching time) in fruits and vegetables.
2. Estimation of minerals -demo
3. Estimation of iodine value
4. Estimation of peroxide value
5. Estimation of reducing and non-reducing sugars using potassium ferricyanide method.

6. Determination of carotenoids w.r.t flour pigments.
7. Extend of non-enzymatic browning by extraction methods.
8. Introduction of the concept of new product

### Essential Readings

- DeMan, J.M.(2018).Principles of Food Chemistry.NewYork: AVI.
- Fellows, P. J. (2009). *Food processing technology: principles and practice*. Elsevier.
- Rahman, M. S. (2020). Handbook of Food Preservation. 3<sup>rd</sup> Edition. India: CRC Press.
- Fennema, Owen. R. (2017). Food Chemistry, 3rd Ed., New York: Marcell Dekker.
- Whitehurst and Law (2002).Enzymes in Food Technology. Canada: CRC Press.
- Graf, E & Saguy,I.S (2011). Food Product Development. Newyork, AVI pub.Co.

### Suggested Readings

- Wong, Dominic W.S. (1996). Food Enzymes. New York: Chapman and Hall.
- Desrosier, Norman W. and Desrosier, James.N. (2018). The technology of food preservation, 4th Ed.Westport, Conn.: AVI Pub. Co.
- Hui, Y. H., & Evranuz, E. Ö. (Eds.). (2015). Handbook of vegetable preservation and processing. CRC press.
- Eskin, N. M., & Shahidi, F. (2012). Biochemistry of foods.
- Simpson, B. K., Nollet, L. M., Toldrá, F., Benjakul, S., Paliyath, G., & Hui, Y. H. (Eds.). (2012). Food biochemistry and food processing. John Wiley & Sons.

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