

## **FOOD CHEMISTRY**

### **THEORY**

<b>Paper No.</b>	<b>:</b>	<b>8</b>
<b>Maximum Marks</b>	<b>:</b>	<b>150</b>
<b>Credits</b>	<b>:</b>	<b>4</b>
<b>Teaching Periods</b>	<b>:</b>	<b>4 Theory + 1 Students' Presentation/ Week</b>
<b>Teaching Load</b>	<b>:</b>	<b>48 Theory Periods + 12 Presentation/ Semester</b>

### **Objectives**

- To understand the chemistry of foods - composition of food, role of each component and their interactions.
- To study the properties of various food components which affect the quality of food.

### **CONTENTS**

#### **UNIT 1 INTRODUCTION TO FOOD CHEMISTRY ( Fennema and Chapter 1 DeMan)** **(1 Lecture)**

Definition and Composition of food

#### **UNIT 2 WATER ( Chapter -1 DeMan) (4 Lectures)**

Definition of water in food, Structure of water and ice, Types of water, Interaction of water with solutes

#### **UNIT 3 LIPIDS (Chapter-2, DeMan) (5 Lectures)**

Classification of lipids, Physical properties-melting point, softening point, specific gravity, refractive index, smoke, flash and fire point, turbidity point. Chemical properties-reichert meissel value, polenske value, iodine value, peroxide value, saponification value.

#### **UNIT 4 PROTEINS (Chapter-3, DeMan) (5 Lectures)**

Protein classification and structure, Nature of food proteins(plant and animal proteins), Properties of proteins (electrophoresis, sedimentation, amphotericism and denaturation)

#### **UNIT 5 CARBOHYDRATES (Chapter-3, Fennema) (6 Lectures)**

Classification (mono, oligo and poly saccharides), Structure of important polysaccharides (starch, glycogen, cellulose, pectin, hemicellulose, gums)  
Chemical reactions of carbohydrates, Modified celluloses and starches

#### **UNIT 6 VITAMINS (Chapter-9, DeMan) (7 Lectures)**

Structure, Importance and Stability, Water soluble vitamins, Fat soluble vitamins

**UNIT 7 FLAVOUR (Chapter-7,DeMan)**

**(7 lectures)**

Definition, Description of food flavours, Flavour enhancers

**UNIT 8 MINERALS (Chapter-5, DeMan)**

**(5 Lectures)**

Major and minor minerals, Metal uptake in canned foods, Toxic metals

**UNIT 9 NATURAL FOOD PIGMENTS (Chap.9,Fennema)**

**(6 Lectures)**

Introduction and classification, Food pigments (chlorophyll, carotenoids, anthocyanins and flavonoids, beet pigments, caramel)

**Recommended Readings**

1. Fennema, Owen R.1996. Food Chemistry, 3<sup>rd</sup> Ed., Marcell Dekker, New York
2. Potter,N.N.and Hotchkiss,J.H.1995. Food Science, 5<sup>th</sup> Ed., Chapman & Hall
3. DeMan, J.M.1982. Principles of Food Chemistry, AVI, NewYork

## PRACTICALS IN FOOD CHEMISTRY

<b>Maximum Marks</b>	<b>:</b>	<b>50</b>
<b>Credits</b>	<b>:</b>	<b>4</b>
<b>Teaching Period</b>	<b>:</b>	<b>4 / Week</b>
<b>Teaching Load</b>	<b>:</b>	<b>48/Semester</b>

### CONTENTS

1. Preparation of primary and secondary solutions
2. Estimation of moisture content
3. Determination of gelatinization temperature range (GTR) of different starches and effect of additives on GTR.
4. Determination of refractive index and specific gravity of fats and oils.
5. Determination of carotenoids w.r.t flour pigments.
6. Estimation of saponification value
7. Estimation of reducing and non-reducing sugars using potassium ferricyanide method.
8. Estimation of total ash.

### Recommended Readings

1. Fennema, Owen R. 1996. Food Chemistry, 3<sup>rd</sup> Ed., Marcell Dekker, New York
2. Whitehurst and Law. 2002. Enzymes in Food Technology, CRC Press, Canada
3. Wong, Dominic WS. 1995. Food Enzymes, Chapman and Hall, New York
4. Potter, N.N. and Hotchkiss, J.H. 1995. Food Science, 5<sup>th</sup> Ed., Chapman & Hall
5. DeMan, J.M. 1982. Principles of Food Chemistry, AVI, New York