# Lesson Plan

# (Based on Academic Calendar for Spring 2024)

# FOOD CHEMISTRY

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| **Course Code:** 0711-2101 | **Course Title:** Food Chemistry |
| **Course Type:** Compulsory | **Level/Term:** Level 2, Term 1 | **Pre-requisite (s):** 0531-1201 |
| **Credit: 3.0** | **Contact Hours: 2.5 Hrs/Week** | **Total Marks: 100 (CIE: 35, SFE:65)** |

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| **Week** | **Number of classes** | **Contents will be covered** | **Teaching/Learning strategy** |
| **1-2** | **1-2** | **Introduction to Chemistry of Foods** - Overview of the course and syllabus - Composition of food and factors affecting quality of foods - Chemistry of functional groups  | Video tutorial, handouts, ppt, video resources |
| **3** | **3-4** | .**Water in Foods** - Water interaction with food components - Food stability and WLF equation - Phase transitions of food containing water  |  |
| **4-5** | **5-8** | **Carbohydrates**Class 5: \*\*: Carbohydrates Introduction and Classification-Introduction and Classification - Features and classification of carbohydrates - Chemical characteristics of sugars Class 6 & 7: Polysaccharides and Dietary Fibers - Dextrin, pectin, gums, agers, starch, glycogen, cellulose, hemicellulose, and chitin - Dietary fiber and pectin substances: occurrence, structure, properties, and use in foodsClass 8: Carbohydrate Digesting Enzymes - Gelatinization and retrogradation properties of starch - Enzymes involved in carbohydrate digestion  | Video tutorial, handouts, ppt, video resources |
| **6** | **9** | **Quiz 1: Introduction to Chemistry of Foods** | Short Question = 15 marks |
| **6-7** | **10-12** | **Chemistry of Amino Acids and Proteins** Class 10: Introduction to Proteins - Composition of proteins, classification, and essential amino acids - Physical and chemical properties of proteinsClass 11: Protein Structure and Functional Properties - Structure and functional properties of proteins in foods - Hydrolysis of proteinsClass 12: Major Food Proteins and Processing Changes - Major food proteins and their sources - Changes in proteins during processing - Determination of proteins. | Video tutorial, handouts, ppt, video resources |
| **8-9** | **13-15** | **Chemistry of Oils and Fats**Class 13: Introduction to Lipids - Physical and chemical properties and classification of lipids - Essential fatty acids Class 14: Lipid Processing - Rancidity, flavor reversion, and processing of oil-bearing materials - Refining of oils and fats Class 15: Advanced Lipid Chemistry - Fat hydrolysis, interesterification, hydrogenation, shortenings, and spreads - Fat replacers, essential oils, terpene oils, and their use in foods  | Video tutorial, handouts, ppt, video resources |
| **9** | **16** | **Quiz 2: Water in Foods** | Short Question = 15 marks |
| **10** | **17** | Review Class before Mid term | Video tutorial, handouts, ppt, video resources |
|  | **Midterm Exam** |
| **13-14** | **18-21** | **Chemistry of Vitamins and Minerals**Class 18: Fat Soluble Vitamins - Chemical composition, structure, stability, and degradation of vitamins Class 19 & 20: Water Soluble Vitamins - Chemical composition, structure, stability, and degradation of vitaminClass 21: Minerals in Foods - Chemical composition, structure, stability, and degradation of minerals | Video tutorial, handouts, ppt, video resources |
| **15-16** | **22-25** | **Food Additives**Class 22: Food Additives Introduction - Definition, classification, and function of food additivesClass 23: Additives I - Colorants, pH controlling agents, nutritive additives, acidulants, and enzymes Class 24: Additives II - Antioxidants, preservatives, emulsifying and stabilizing agents, anti-caking agentsClass 25: Additives III - Flavoring agents, thickeners, firming agents, flour bleaching agents, and clarifying agents - Benefits and risks of using food additives  | Video tutorial, handouts, ppt, video resources |
| **17** | **26** | **Specific Reactions of Food Components**Class 26: Browning Reactions - Introduction to browning reactions in foods - Non-enzymatic browning: Maillard reaction and caramelization  | Video tutorial, handouts, ppt, video resources |
| **17** | **27** | **Quiz 3: Chemistry of Vitamins and Minerals** | Short Question = 15 marks |
| **18-19** | **28-30** | **Specific Reactions of Food Components**Class 28 & 29: Browning Reactions Continued - Pigment formation, melanoidin, and Maillard polymers - Ascorbic acid oxidationClass 30: Antioxidant Activity and Inhibition - Antioxidant activity of non-enzymatic browning products - Inhibition of non-enzymatic browning . | Video tutorial, handouts, ppt, video resources |
| **19-20** | **31-33** | **Presentation of Students Individual** | PPT |
|  | **34-36** | **Review Class before Final** |  |
|  | **Final Examination**  |