# 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 foods  Class 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 proteins  Class 11: Protein Structure and Functional Properties  - Structure and functional properties of proteins in foods  - Hydrolysis of proteins  Class 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 vitamin  Class 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 additives  Class 23: Additives I  - Colorants, pH controlling agents, nutritive additives, acidulants, and enzymes    Class 24: Additives II  - Antioxidants, preservatives, emulsifying and stabilizing agents, anti-caking agents  Class 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 oxidation  Class 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** | |