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**Department of Food Technology**

**College of Agricultural Engineering Sciences**

**Salahaddin University- Erbil**

**Subject: Food Analysis**

**Course Book: 4th Year/ 8th Semester**

**Lecturer's name: Dr Bashdar Abuzed Sadee**

**Academic Year: 2022/2023**

**Course Book**

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| **1. Course name** | | **Food Microbiology** | | |
| **2. Lecturer in charge** | | Assist Prof Dr Bashdar Abuzed Sadee | | |
| **3. Department/ College** | | Food Technology Department/ Agricultural Engineering Sciences | | |
| **4. Contact** | | e-mail:bashdar.sadee@su.edu.krd  Tel: (optional) | | |
| **5. Time (in hours) per week** | | Theory: 2h  Practical: 3h | | |
| **6. Office hours** | | 3 hours ………. | | |
| **7. Course code** | | **----** | | |
| **8. Teacher's academic** | | **Graduated from University of Salahaddin in 2003 with a bachelor degree in Chemistry. Obtained MSc in 2010 from Chemistry Department-College of Science- Salahaddin University. I was awarded the Degree of Doctor of Philosophy in 2016 from Plymouth University-UK.** | | |
| **9. Keywords** | | Instrument, proximate, uv-vis-spectroscopy, sampling, data analysis. | | |
| **10. Course overview:**  Food analysis is particularly complex due to the intricate food system, which includes key physicochemical and biological characteristics of raw materials, potential existence of microorganisms, different contaminants and additives, and the processing techniques used. The big focus of this course is to provide introduction to food analysis. Principles and compartments of some instruments which are useful in food analysis will be illustrated in details. Macro- and micronutrients will be detected in different food matrix including cereal, lipid, fruit, etc using some of useful certified method AOAC. This course also leads student how to prepare samples and also address problems associated with samples including sample matrix. | | | | |
| **11. Course objective:**  The main goal of this course is application of instruments to determine food constituents. Using different instruments based on the analyte of interest. Different physical and chemical properties of food constituents will be analyzed. | | | | |
| **12. Student's obligation**   1. Attend all lectures/ teaching hall 2. Student engagements and activities will be monitored 3. Student should prepare for quizzes in each session 4. Show respect and dress appropriately 5. Respect fellow students and their ideas 6. Mobile phones should be switched off or at least keep it in silent mode 7. Performing the official tests/ exams 8. If a student missed more than 5% of total hours during the course, he/ she will be informed by dept. for initial warning, and if reached to 10% or more will be informed to be expel from that course in the that academic year.   9.Provide reports and give presentation | | | | |
| **13. Forms of teaching**  1- Contact hours: 2 theoretical weekly hours + 3 Practical lab experiment introduction, preparing the material and equipment’s to precede the experiment, learning techniques and getting results.  2- Each session will be presented using projector and board.  3- Brainstorming and Group discussion.  4-Communicate professionally with students in order to engage with the class and the subject.  5-Lecture will be available to be printed for students on moodle platform before any class. | | | | |
| **14. Assessment scheme:**  The grades scheme as follows:  Midterm Examination 15 %  Practical Examination 35 %.  Final Examination 50 %.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Total Marks 100% | | | | |
| **15. Student learning outcome:**  By the end of this course, students will have a basic understanding of:  1. how to prepare food samples including oven drying and freeze drying of food samples  2. Steps of analyzing food samples  3. Principles and applications of some common instruments including spectrophotometer, AAS, HPLC, ICP-MS in food analysis.  4. how to evaluate data relates to food constituents.  5. determining macro and micro constituents of different food samples. | | | | |
| **16. Course Reading List and References‌:**   1. Food Analysis4th edition (2010) Nielsen. 2. Food Analysis Laboratory manual2nd edition (2010) S. Suzanne Nielsen.   Food Acidy & safety 2008. Brian. Nummer.  **17. The Topics:** | | | | |
| **W** | **Theoretical Topics** | | **No. of hours** | **Date** |
| 1 | Introduction to Food Analysis | | 2 |  |
| 2 | Steps in Analysis | | 2 |  |
| 3 | Choice and validity of method | | 2 |  |
| 4 | *An introduction to instrumental Analysis* | | 2 |  |
| **5** | *Ultraviolet, Visible, Spectroscopy* | | 2 |  |
| 5 | Basis of Quantitative Absorption Spectroscopy | | 2 |  |
| **6** | 1st midterm Examination | | 2 |  |
| 7 | Radiant energy | | 2 |  |
| 8 | Molecular Absorption in Viss region | | 2 |  |
| 9 | Instrumentation | | 2 |  |
| 10 | Deviations from Beer’s Law | | 2 |  |
| 11 | 2nd Midterm examination | | 2 |  |
| 12 | *Fluorescence Spectroscopy* | | 2 |  |
| 13 | *Atomic Absorption Spectroscopy* | | 2 |  |
| 14 | *Infrared Spectroscopy* | | 2 |  |
| 15 | Final Examination (Theory) | | 2 |  |
| **W** | **Practical Topics** | | **No. of hours** | **Date** |
| 1 | Introduction to food analysis, instructions and laboratory safety. | | 3 |  |
| 2 | sampling and sample preparation, preparing standard solution. | | 3 |  |
| 3 | Evaluation of Data | | 3 |  |
| 4 | Stock solution and calibration curve | | 3 |  |
| 5 | Determination of unknown concentration using spectrophotometer  . | | 3 |  |
| 6 | Test #1  Assignment No. 1 – Review | | 3 |  |
| 6 | pH and acid Titratable | | 3 |  |
| 7 | Carbohydrate analysis | | 3 |  |
| 8 | Fat Analysis | | 3 |  |
| 9 | Vitamin Analysis | | 3 |  |
| 10 | Practical exam #2  Assignment No. 2 | | 3 |  |
| 11 | Protein Analysis | | 3 |  |
| 12 | Traditional Methods for Mineral Analysis | | 3 |  |
| 13 | Analysis of Food Contaminants, Residues, and Chemical Constituents of Concern | | 3 |  |
| 14 | Final Examination (Practical) | |  |  |
| **19. Examinations:**  1. Comparison 2. Definitions, 3. True or false type of exams,4. Multiple choices,5- Filling blanks, 6 - Select the most appropriate words or statements, 7-Calculation questions.  Compositional questions: In this type of exam the questions usually starts with Explain how, What are the reasons for…?, Why…?, How….?  With their typical answers  Examples should be provided  Q) Why do consumers, the food industry, national and international regulations challenge food scientists?  Q/ What are the steps of in analysis of foods?  Theory…………………. Practical ……………………Q/ What is the principle of pH and Acid titratable experiment? | | | | |
| **20. Extra notes:**  For practical session, students must to bring their own lab coats.  We need some scientific trips to food factories/ or food companies and quality control laboratory to experience manufacturing process and analysing food samples.  The planned schedule is flexible and may change depending on the local circumstances including unexpected holidays. | | | | |
| **21. Peer review**  This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.  *(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).* | | | | |