



**Syllabus\* : Food Chemistry and Analysis practical (1905021337)**  
**Second Semester 2021 /2022**

| COURSE INFORMATION  |  |
|---|--|
| <b>Course Name:</b> food chemistry and analysis practical<br><b>Semester:</b> second<br><b>Department:</b> Department of Clinical Nutrition<br><b>Faculty:</b> Applied Medical Sciences   | <b>Course Code:</b> 140502337<br><b>Section:</b> 1, 2<br><b>Core Curriculum:</b> Major requirements  |
| <b>Day(s) and Time(s):</b> Wed: 8:00-11:00, 11:00-14:00<br><b>Classroom:</b> A.M. Food analysis Lab   | <b>Credit Hours:</b> 1<br><b>Prerequisites:</b> 140502336 or 1905021336  |
| COURSE DESCRIPTION  |  |
| The roles of food analysis, sampling, recording, and interpreting of results, experimental errors; Spectroscopy theory, atomic absorption, spectrophotometry and chromatography techniques such as paper, thin layer, GLC, and HPLC .   |  |
| DELIVERY METHODS  |  |
| The course will be delivered through a combination of active learning strategies. These will include: <ul style="list-style-type: none"> <li>• PowerPoint lectures and active classroom-based discussion</li> <li>• Collaborative learning through small groups acting in an interdisciplinary context.</li> <li>• Physical in lab</li> </ul> |  |
| FACULTY INFORMATION   |  |
| <b>Name</b>   | <b>Buthaina Mahmoud Alkhatib</b>   |
| <b>Academic Title:</b>  | <b>Lecturer</b>  |
| <b>Office Location:</b>   | <b>Applied Medical Sciences-1129</b>   |
| <b>Telephone Number:</b>  | <b>0788661058</b>  |
| <b>Email Address:</b>   | <b>bkhatib@hu.edu.jo</b>   |
| <b>Office Hours:</b>  | <b>Sunday</b> 10:00- 11:00; 12:00-13:00<br><b>Tuesday</b> 12:00- 13:00<br>Please send an e-mail (bkhatib@hu.edu.jo) to meet at any other time. |

## REFERENCES AND LEARNING RESOURCES

### Required Textbook

- Nielsen, S. S (editor) 2003. Food Analysis, 31(1 edition, Kluwer Academic/Plenum Publishers., New York, NY.
- Laboratory Manual
- Lecture notes, handouts & articles
- Fenema, O. (editor) 1996. Food Chemistry 3rd ed. Marcel Dekker, New York, USA.
- Food Analysis: Theory and Practice. Pomeranz and Meloan, 3rd. ed., 1994.
- Official methods of analysis- AOAC (15th ed)
- <http://arborcom.com>    [www.nal.usda.gov/finc](http://www.nal.usda.gov/finc)    [www.eatright.org](http://www.eatright.org)  
[www.cyberdiet.com](http://www.cyberdiet.com)    [navigator.tufts.edu](http://navigator.tufts.edu)

## COURSE LEARNING OUTCOMES

| Number           | Outcomes  | Corresponding Program outcomes |
|------------------|---|--------------------------------|
| <b>Knowledge</b> |   |                                |
| <b>K1</b>        | Student is expected to<br>1. list the general principles in food analysis<br>2. Understand the principles behind the analytical techniques.   | <b>KP1</b>                     |
| <b>K2</b>        | know the way of reporting results   | <b>KP3</b>                     |
| <b>Skills</b>    |   |                                |
| <b>S1</b>        | 1. Apply statistical principles for data evaluation<br>2. Identify the various principles used to determine food components such as moisture, ash, protein..etc<br>3. Identify the reasons of food components analysis                                | <b>SP1</b>                     |
| <b>S2</b>        | 1. Be able to write concise laboratory report<br>2. Be able to acquire skills and abilities to conduct proximate and some micronutrients analysis<br>3. Know methods of selecting the appropriate analytical techniques for a specific food component | <b>SP3</b>                     |

## STUDENT LEARNING OUTCOMES MATRIX\*

| Number           | Learning Outcomes  | Learning Method* | Assessment Method**        |
|------------------|--|------------------|----------------------------|
| <b>Knowledge</b> |  |                  |                            |
| <b>K1</b>        | Student is expected to<br>1. Understand the chemical structure and properties of water, colloids, proteins, carbohydrates, lipids, enzymes and natural pigments. | Lecture          | <b>Assignment +reports</b> |
| <b>K2</b>        | 1. Understand the chemical reactions of the major food components during processing and storage.   | Flipped class    | <b>Quiz+ reports</b>       |
| <b>Skills</b>    |  |                  |                            |
| <b>S1</b>        | explain the important chemical and physical  | Lecture          | <b>Experiment</b>          |

|           |  |         |                    |
|-----------|--|---------|--------------------|
|           | interactions between food constituents that affect quality and nutritive value.  |         | <b>application</b> |
| <b>S2</b> | 1. Distinguish between monounsaturated and polyunsaturated fatty acids<br>2. Distinguish between monosaccharides, oligosaccharides and polysaccharides | Lecture | <b>Report</b>      |

## ACADEMIC SUPPORT

It is The Hashemite University's policy to provide educational opportunities that ensure fair, appropriate, and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate individual needs.

**Special Needs Section:**

**Tel: 0788661058**

**Location:** Applied Medical Sciences, office 1129

**Email:** bkhatib@hu.edu.jo

## COURSE REGULATIONS

***Participation***

Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes. A student should not miss more than 15% of the classes during a semester. *Those exceeding this limit of 15% will receive a failing grade regardless of their performance.* It is a student's responsibility to monitor the frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in a non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a class provided that the number of such occasions does not exceed the limit allowed by the University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

***Plagiarism***

Plagiarism is considered a serious academic offense and can result in your work losing marks or being failed. HU expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviors that compromise his/her own integrity as well as that of the Hashemite University.

Plagiarism includes the following examples, and it applies to all student assignments or submitted work:

- Use of the work, ideas, images or words of someone else without his/her permission or reference to them.
- Use of someone else's wording, name, phrase, sentence, paragraph, or essay without using quotation marks.
- Misrepresentation of the sources that were used.

**The instructor has the right to fail the coursework or deduct marks where plagiarism is detected**

### ***Late or Missed Assignments***

In all cases of assessment, students who fails to attend an exam, class project or deliver a presentation on the scheduled date without prior permission, and/or are unable to provide a medical note, will automatically receive a fail grade for this part of the assessment.

- Submitting a term paper on time is a key part of the assessment process. Students who fail to submit their work by the deadline specified will automatically receive a 10% penalty. Assignments handed in more than 24 hours late will receive a further 10% penalty. Each subsequent 24 hours will result in a further 10% penalty.
- In cases where a student misses an assessment on account of a medical reason or with prior permission; in line with University regulations an incomplete grade for the specific assessment will be awarded and an alternative assessment or extension can be arranged.

### ***Student Complaints Policy***

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

## **COURSE ASSESSMENT**

### ***Course Calendar and Assessment***

Students will be graded through the following means of assessment and their final grade will be calculated from the forms of assessment as listed below with their grade weighting taken into account. The criteria for grading are listed at the end of the syllabus

| <b>Assessment</b>                      | <b>Grade Weighting</b> | <b>Deadline Assessment</b> |
|--|------------------------|----------------------------|
| Midterm exam                           | 30%                    | 27/4/2022                  |
| Various assessments (quizzes, reports) | 30%                    | Continuous                 |

|            |     |                       |
|------------|-----|-----------------------|
|            |     |                       |
| Final Exam | 40% | 16 <sup>th</sup> Week |

### Description of Exams

Test questions will predominately come from the material presented in the lectures. Semester exams will be conducted during the regularly scheduled lecture period. The exam will consist of a combination of multiple-choice, short answer, match, true and false, and/or descriptive questions.

**Homework:** Will be given for each chapter, while the chapter is in progress you are supposed to work on them continuously and submit them in the next lecture when I finish the chapter.

You are also expected to work on in-chapter examples, self-tests, and a representative number of end-of-chapter problems. The answers of self-tests and end-of-chapter exercises are given at the end of the book.

**Quizzes:** Unannounced quizzes will be given during or/and at the end of each chapter based upon the previous lectures. It will enforce that you come prepared for the class.

No make-up exams, homework or quizzes will be given. Only documented absences will be considered as per HU guidelines.

**Grades are not negotiable and are awarded according to the following criteria\*:**

| Letter Grade | Description | Grade Points |
|--------------|-------------|--------------|
| A+           | Excellent   | 4.00         |
| A            |             | 3.75         |
| A-           |             | 3.50         |
| B+           | Very Good   | 3.25         |
| B            |             | 3.00         |
| B-           |             | 2.75         |
| C+           | Good        | 2.50         |
| C            |             | 2.25         |
| C-           |             | 2.00         |
| D+           | Pass        | 1.75         |
| D            | Pass        | 1.50         |
| F            | Fail        | 0.00         |
| I            | Incomplete  | -            |

## Weekly lecture schedule and content distribution

### I. Theoretical part

| Week  | Topic   | Learning Methods       | Tasks        | Learning Material |
|-------|---|------------------------|--------------|-------------------|
| 1-2   | Food sampling (steps, size, type of samples, techniques)                      | Lecture                | Short report | Reference 1       |
| 3     | Moisture and total solid analysis syrups,                                     | Collaborative learning | Quiz         | 2                 |
| 4     | Ash and minerals analysis   | Lecture                | Assignment   | 1 and 2           |
| 5     | Protein analysis  | Flipped class          | Quiz         |                   |
| 6-7   | Lipid analysis and characterization   | Lecture                | Short exam   | Ref. 3            |
| 8-9   | Carbohydrate analysis   | Lecture                | Presentation | Ref. 4            |
| 10-12 | Basic principles of Spectroscopy-U V-Visible, IR, Atomic absorption, emission | Lecture                | Report       | Ref. 1            |
| 13-14 | Basic principles of chromatography (HPLC, GC, CC, TLC)                        | Lecture                | Presentation |                   |
| 16    | <b>Final Exam</b>   |                        |              |                   |

\* Includes: Lecture, flipped Class, project-based learning, problem-solving based learning, collaborative learning

### II. Practical part

| Week                          |   |
|-------------------------------|---|
| 1                             | Preparation of solutions with different expressions (molarity, percentage, normality, ppm). |
| 2                             | Determination of moisture and total solids by oven drying.                                  |
| 3                             | ASH, Water activity & Total soluble solids Determination                                    |
| 4                             | Determination of Carbohydrate: Benedicts, iodine test for starch, Fehling                   |
| 5                             | Starch gelatinization   |
| <b>Midterm exam 27/4/2022</b> |   |
| 7                             | Determination of Free Fatty acids in oils   |
| 8                             | Determination of lipid content  |
| 9                             | Lipid Oxidation: peroxide value   |
| 10                            | Protein determination   |

\* Includes: Lecture, flipped Class, project-based learning, problem-solving based learning, collaborative learning

**ASSESSMENT Rubric**

**Classroom participation: Assessment Criteria**

| Criteria   | Quality   |   |   |   | score |
|--|---|---|---|---|-------|
|  | Excellent<br>(4 points)   | Good<br>(3 points)  | Satisfactory<br>(2 points)  | Needs<br>Improve<br>ment<br>(1 points)  |       |
| <b>The degree to which student integrates course readings into classroom participation</b> | <ul style="list-style-type: none"> <li>- often cites from readings.</li> <li>- uses readings to support points.</li> <li>- often articulates "fit" of readings with the topic at hand.</li> </ul>                                 | <ul style="list-style-type: none"> <li>- occasionally cites from readings.</li> <li>- sometimes uses readings to support points.</li> <li>occasionally articulates "fit" of readings with the topic at hand.</li> </ul>           | <ul style="list-style-type: none"> <li>- rarely able to cite from readings.</li> <li>- rarely uses readings to support points.</li> <li>rarely articulates "fit" of readings with the topic at hand</li> </ul>                                      | <ul style="list-style-type: none"> <li>- unable to cite from readings.</li> <li>cannot use readings to support points;</li> <li>cannot articulate "fit" of readings with the topic at hand.</li> </ul>                                  |       |
| <b>Interaction/participation in classroom discussions</b>                                  | <ul style="list-style-type: none"> <li>- always a willing participant, responds frequently to questions.</li> <li>routinely volunteers' point of view.</li> </ul>   | <ul style="list-style-type: none"> <li>- often a willing participant,</li> <li>- responds occasionally to questions.</li> <li>occasionally volunteers' point of view.</li> </ul>  | <ul style="list-style-type: none"> <li>- rarely a willing participant,</li> <li>- rarely able to respond to questions.</li> <li>rarely volunteers' point of view.</li> </ul>  | <ul style="list-style-type: none"> <li>- never a willing participant.,</li> <li>- never able to respond to questions.</li> <li>never volunteers point of view.</li> </ul>   |       |
| <b>Interaction/participation in classroom learning activities</b>                          | <ul style="list-style-type: none"> <li>- always a willing participant.</li> <li>- acts appropriately during all role plays.</li> <li>- responds frequently to questions.</li> <li>routinely volunteers' point of view.</li> </ul> | <ul style="list-style-type: none"> <li>- often a willing participant.</li> <li>- acts appropriately during role-plays.</li> <li>- responds occasionally to questions.</li> <li>occasionally volunteers' point of view.</li> </ul> | <ul style="list-style-type: none"> <li>- rarely a willing participant.</li> <li>- occasionally acts inappropriately during role-plays.</li> <li>- rarely able to respond to direct questions.</li> <li>rarely volunteers' point of view.</li> </ul> | <ul style="list-style-type: none"> <li>- never a willing participant</li> <li>- often acts inappropriately during role-plays.</li> <li>- never able to respond to direct questions.</li> <li>never volunteers point of view.</li> </ul> |       |
| <b>Demonstration of professional attitude and demeanor</b>                                 | <ul style="list-style-type: none"> <li>- always demonstrates commitment through thorough preparation.</li> <li>- always arrives on time.</li> <li>often solicits instructors' perspectives outside class.</li> </ul>              | <ul style="list-style-type: none"> <li>- rarely unprepared;</li> <li>rarely arrives late.</li> <li>occasionally solicits instructors' perspectives outside class.</li> </ul>  | <ul style="list-style-type: none"> <li>- often unprepared;</li> <li>occasionally arrives late.</li> <li>rarely solicits instructors' perspectives outside class.</li> </ul>   | <ul style="list-style-type: none"> <li>- rarely prepared.</li> <li>- often arrives late.</li> <li>never solicits instructors' perspective outside class</li> </ul>  |       |