



Course Specifications

Course Title:	Analytical food chemistry (2)
Course Code:	2063208-3
Program:	Bachelor in Food Science and Nutrition
Department:	Food Sciences and Nutrition Department
College:	College of Science
Institution:	Taif University

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A. Course Identification:

1. Credit hours: 3 Hours
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 7 th level/ 3 rd year
4. Pre-requisites for this course (if any): Chemistry of Food Components (2062203-3)
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	
	Total	60

B. Course Objectives and Learning Outcomes:

1. Course Description:

Introduction to food analysis – importance of moisture in foods and determination methods – determination of food acidity and pH- ash in food (importance and determination)- food protein (structure, function and determination methods) and food enzymes - carbohydrate contents in foods (importance, classification and determination) – fat (classification, extraction, determination of physical and chemical properties) - water soluble and fat soluble vitamins (classification, properties and determination) – determination of additives and preservatives.

2. Course Main Objective:

1. Provide an overview of the basic principles of food analysis techniques
2. Developing critical and creative thinking to determine the nutritional component and quality of food products.
3. Recognize food validity and its conformation to the standard specification

3. Course Learning Outcomes:

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Recognize the basic principles of food analysis methods	K3
1.2	Describe the food ingredients and evaluate the food quality.	K3
2	Skills :	
2.1	Classify how food analysis fits into the food industry	S1

CLOs		Aligned PLOs
2.2	Compare the purposes and methods of food analysis employed in government, research and industry.	S3
2.3	Apply modern instrumental methods to analyze chemical and physical properties of foods as well as its hazardous components.	S3
3	Values:	
3.1	Cooperate with his colleagues in work groups	V1
3.2	Support the analysis data written and orally.	V3

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to food analysis. Introduction, sampling, food composition and evaluation of analytical data.	3
2	Moisture in food; Importance of assay in foods, forms of water in foods, Methods of moisture determination (drying methods, chemical, physical, vacuum oven and infra-red methods)- Acidity and pH of foods	6
3	Ash and minerals determination- Ashing methods Estimation of total ash, dry ash, wet ash and metal ion determinations.	3
4	Proteins; Classification, nature of proteins (plant and animal proteins) - composition, function, extraction, purification, Methods of protein determination.	3
5	Carbohydrates; Definition, importance, classification, determination of reducing and non-reducing.	3
7	Fats, Oils and Lipids, Definitions, classifications, physical and chemical properties.	3
8	Vitamins; Importance, structure, water soluble and fat-soluble vitamins, chromatographic and spectroscopic methods for vitamins determination.	3
9	Flavors a preservative; Definitions, structure, importance, chromatographic and spectroscopic methods for determination of some flavoring agents a preservative.	6
Total		30
Experimental Topics		
1	*Determination of solution concentration (molarity and normality)	3
2	* Quantitative determination of moisture in different food stuffs (i.e., Dairy products, Fresh foods and Bakery products).	3
3	*Acidity and pH of foods - determination of pH and treatable acidity	3
4	* Quantitative determination of ash, acid soluble ash and mineral contents * Quantitative determination of protein in various food products (Kjeldahl method and colorimetric method)	6
5	* Carbohydrate extraction and clarification - Quantitative determination of reducing and non-reducing sugars (titration and colorimetric methods).	6
7	*Quantitative determination of crude lipids (ether extract) *Physical properties (melting point, specific gravity, refractive index... etc). *Chemical properties of fats (acid value, iodine value, peroxide value, saponification number.; etc.)	6
8	* Determination of Vitamin C content of various orange juice products using the indicator dye 2, 6-dichloroindophenol in a titration method - * Isolation and determination of anthocyanin in common fruits and vegetables by reversed-phase HPLC	3
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding		
1.1	Recognize the basic principles of food analysis methods	Lecture - Project	Written Exam- Oral Exam
1.2	Describe the food ingredients and evaluate the food quality.	Lecture-Discussion	Written Exam- Oral Exam
2.0	Skills		
2.1	Explain how food analysis fits into the food industry	Lecture-Discussion	Written exam
2.2	Compare the purposes and methods of food analysis employed in government, research and industry.	Lecture-Discussion	Written exam (Practical) - Report
2.3	Apply modern instrumental methods to analyze chemical and physical properties of foods	Lecture-Discussion	Written exam (Practical) - Report
3.0	Values		
3.1	Cooperate with his colleagues in work groups	Assignments discussion	Report
3.2	Support the analysis data written and orally.	Project Assignment	Report

2. Assessment Tasks for Students:

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignment and Interaction during lectures	Continues	10%
2	Midterm exam	5-6	20%
3	Weekly Lab. Reports	Continues	20%
4	Practical exam	11	10%
5	Final exam	12	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- There are 6 h per week for this purpose and the students know these hours according to the time of professor who teach the course.
- Student satisfaction surveys are conducted for academic guidance.
- Develop an improvement plan for academic guidance based on the results of the questionnaire analysis.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1) Nielsen, S. S. (2009). Food analysis. 4th edition, Springer New York Dordrecht Heidelberg London 2) Richardson, G.H. (1985). Standard methods for the examination of dairy products. 15th ed. American public health association, Washington, D.C. 3) James C.S. Analytical Chemistry of Foods. Blackie Academic & Professional. London, NY, Tokyo, Melbourne, 1995.
Essential References Materials	A.A.C.C. (2012). International Methods Approved of the American Association of Cereal Chemists, 11 th ed., American Association of Cereal Chemists, INC. st., Paul, Minnesota, USA

Electronic Materials	www.fao.org/fao-who-codexalimentarius https://www.who.int/foodsafety/areas_work/food-standard/en/ International food standards (FAO/WHO Codex Alimentarius). https://www.iso.org Journal of Food Composition and Analysis Food Analytical Methods Journal of Food and Drug Analysis
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	1. One Lecture Hall with comfortable seats (about 50 m2) for 3 hours a week 2. One laboratory for 3 hours a week with internet facility.
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show and Black Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	- Equipment's - Chemical, reagents, indicators and lab. Tools (i.e. pipets, different Pyrex flasks, cylinders, filter paper,...etc)

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students, faculty, program leaders and Peer Reviewer	<ul style="list-style-type: none"> Continuous monitoring by directors of program and quality assurance unit (Direct). Applying Questionnaires received from the Deanship of Academic Development for Student evaluation (indirect). Evaluation of course report (indirect).
Extent of achievement of course learning outcomes	Students, faculty, program leaders and Peer Reviewer	<ul style="list-style-type: none"> Applying Questionnaires for Student evaluation (indirect). Evaluation of course report (indirect).
Quality of learning resources	Faculty, program leaders, administrative staff, independent reviewers.	<ul style="list-style-type: none"> Continuous monitoring by directors of program and quality assurance unit (Direct). Applying Questionnaires for Student evaluation (indirect). Evaluation of course report (indirect).

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Department council - Academic Development Committee	
Reference No.	Department council NO: 2	Subject NO: 1
Date	30 /02 /1444 H	

