

Kingdom of Saudi Arabia
The National Commission for
Academic Accreditation & Assessment



COURSE SPECIFICATION

(Chemistry of Fats and Oils, 402472-2)

1435/ 1436 H

Course Specification

Institution: Umm Al-Qura University
College/Department: Faculty of Applied Sciences/ Chemistry Department

A. Course Identification and General Information

1. Course title and code: Chemistry of Fats and Oils, 402472-2
2. Credit hours: 2 hrs
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Industrial chemistry
4. Name of faculty member responsible for the course: Dr. Nizar El Guesmi
5. Level/year at which this course is offered: 7th / fourth year
6. Pre-requisites for this course (if any): Organic Chemistry 4
7. Co-requisites for this course (if any):
8. Location if not on main campus:

B. Objectives

1. Summary of the main learning outcomes for students enrolled in the course. Study of all the information about the subject of fats and oils. Chemical and physical structure, quality control analysis, refining and specialty oils. The combination of lectures and practical sessions has been designed to enable you to explore all aspects of these essential ingredients.
2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field) Smart use of teaching halls for lectures The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
List of Topics	No of Weeks	Contact hours
Definitions, the difference between fats and oils, types and chemical structure of fats and oils.	2	4
Processing techniques in extracting and refining fats and oils from sources, including animals, fruit and seeds.	2	4
Methods of determination of iodine number, peroxide number, % free fatty acid.	2	4
Production process flow charts to produce a range of products. Quality specifications for the manufactured products are established.	2	4
First regular exam	1	2
Extraction of oils.	1	2
The application of hydrogenated fats in the food industry. Steps in production processes are identified for the manufacture of a range of fats and oil products.	2	4
Manufacture of butter, margarine and mayonnaise.	2	4
Requirements for safety of fat and oil products in the process of production and storage.	1	2

2 Course components (total contact hours per semester):					30
Lecture:	Tutorial:	Laboratory	Practical/Field work/Internship	Other:	

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week)

Office hours: during the weekly working hours (**4 hours/week**).

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge

(i) Description of the knowledge to be acquired

- Recognize the chemical composition and physical, chemical properties of fats and oils.
- Determine the iodine number, peroxide number, % free fatty acid of the oil.
- Know factors affecting characteristics of fats and oils
- Understand classification of fats and oils on the basis of applications, saturation and carbon chain length.
- Know industrial applications of fats and oils.
- Distinguish essential fatty acids and know his functions in the body.
- Know processing of fatty acids.
- Explain hydrogenation steps of oils and understand factors affecting hydrogenation.

(ii) Teaching strategies to be used to develop that knowledge

- Using open scientific discussion to link the previous knowledge to the current and future topics on chemistry of fats and oils.
- The students use the internet to prepare an essay about a recent advances related to the course of on chemistry of fats and oils.

(iii) Methods of assessment of knowledge acquired

Tests editorial periodic and final

Oral tests

Systematic research on the subject of the topics scheduled

<p>b. Cognitive Skills</p>
<p>(i) Description of cognitive skills to be developed</p> <p>The student acquires the skill to differentiate between different fatty acids in oils.</p> <p>The student understands all steps which must be done during processing of fatty acids.</p> <p>Improve the advantage to discover the unknown fatty acids from different oils</p>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <ul style="list-style-type: none"> • Using brain storming at the beginning of each lecture in order to stimulate the students towards the new topic of the course. • Enhancing open discussion during the lecture. • Assigning student's duties that include open tasks designed for the application of prediction and analysis skills, problem solving. • Provide the students with examples and practical tasks that performed under the supervision of lecturers. • Giving some applied examples and problem and ask the students to find a strategic plan to resolve them. • Encourage learning transmission using analysis tools in different applications and through discussion of potential applications in other areas.
<p>(iii) Methods of assessment of students cognitive skills</p> <p>Through assignments and homework</p> <p>Tests editorial periodic and final</p> <p>Oral tests</p>
<p>c. Interpersonal Skills and Responsibility</p>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <ul style="list-style-type: none"> • Evaluate and develop the student's ability to work in a team. • The development of the ability of students to think and work in individual manner. • Working effectively in groups and exercise leadership when appropriate

<ul style="list-style-type: none"> • Act ethically and consistently with high moral standards in personal and public forums • Community linked thinking
<p>(ii) Teaching strategies to be used to develop these skills and abilities</p> <ul style="list-style-type: none"> • Divide the students into team works to evaluate their ability to work in groups and Making open discussion about certain recent topic of the course • Periodic duties that carried out in individual manner to evaluate the ability of students to take responsibility and self-reliance.
<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <p>Evaluate the results and analysis of the issues and collective research and knowledge of the contribution of each individual through dialogue and discussion</p>
<p>d. Communication, Information Technology and Numerical Skills</p>
<p>(i) Description of the skills to be developed in this domain.</p> <ul style="list-style-type: none"> • Communicate effectively in oral and written forms • Use information and communication technologies • Use basic mathematical and statistical techniques
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> • The use of computers in the training room of the department. • Organization of group visits to the central Library. • The use of the international information network .
<p>(iii) Methods of assessment of students numerical and communication skills</p> <ul style="list-style-type: none"> • Ask questions that measure the student's ability to interpret simple statistical information. • Evaluate the homework's and duties associated with the proper use of communication skills and numerical process.

e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required <ul style="list-style-type: none"> • It is not requirement for this course.
(ii) Teaching strategies to be used to develop these skills <ul style="list-style-type: none"> • It is not requirement for this course.
(iii) Methods of assessment of students psychomotor skills <ul style="list-style-type: none"> • It is not requirement for this course.

5. Schedule of Assessment Tasks for Students During the Semester:			
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Class activities, Attendances and Duties	Throughout the Term	10%
2	Mid-Term Exam (s)	5-14	40%
3	Final Exam	End of the Term	50%
4	Total		100%

D. Student Support

<p>1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)</p> <ul style="list-style-type: none"> - Availability of teaching staff to provide counseling and advice. - Office hours: during the weekly working hours, create the appropriate means (4 hours/week). - Academic guidance to students who need it, and taking into account the appropriate selection of members for that.

E. Learning Resources

<p>1. Required Text(s)</p> <p>F. D. Gunstone., The Chemistry of Oils and Fats: Sources, Composition, Properties and Uses, Wiley-Blackwell, 1st Edition (2004).</p>
<p>2. Essential References</p> <ul style="list-style-type: none"> - Richard D. O'Brien, Walter E. Farr, Peter J. Wand. Introduction to fats and oils, technology. American Oil Chemists Society, 2000. - Michael Bockisch, Fats and oils handbook , American Oil Chemists & Society, 1998. - Wolf Hamm, Richard John Hamilton. Edible oil processing. Sheffield Academic Press, 2000
<p>3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)</p> <p>F. D. Gunstone., Oils and Fats in the Food Industry, John Wiley & Sons, (2009).</p>
<p>4-.Electronic Materials, Web Sites etc</p> <ul style="list-style-type: none"> • http://www.chemweb.com • http://www.sciencedirect.com • http://www.rsc.org
<p>5- Other learning material such as computer-based programs/CD, professional standards/regulations</p> <ul style="list-style-type: none"> ▪ Microsoft Power Point, Microsoft Word, Microsoft Excel ▪ Videos about chemical reactions of fat and oils. ▪ Learning tablets for chemistry of fat and oils.

F. Facilities Required

<p>Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)</p>
<p>1. Accommodation (Lecture rooms, laboratories, etc.)</p> <ul style="list-style-type: none"> • Classroom capacity (30) students. • Hall processing appropriate means, including educational and computers and Projector
<p>2. Computing resources:</p>

Hall equipped with a computer , Projector and TV
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) : There are no other requirements

G Course Evaluation and Improvement Processes

1- Strategies for Obtaining Student Feedback on Effectiveness of Teaching The educational process is evaluated using questionnaire forms or panel discussions with students in order to identify and address weakness and strength points.
2- Other Strategies for Evaluation of Teaching by the Instructor or by the Department <ul style="list-style-type: none"> • Observations and assistance from colleagues. • Independent evaluation of the extent to which students' standards. • Independent advice of duties and tasks
3- Processes for Improvement of Teaching <ul style="list-style-type: none"> • Workshops for teaching methods. • Provide the necessary modern tools for learning. • Application means of e-learning. • Exchange of internal and external expertise
4- Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) <ul style="list-style-type: none"> • Correction examination of a sample of the test papers, or student work, which was corrected by teaching staff member. • A professor scheduled exchange of a sample of assignments or tests corrected periodically with another member of the teaching staff of the same course in another educational institution
5- Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none"> • Periodic review of course content and modify the negatives. • Host a visiting professor to evaluate the course. • Workshops for teaching staff members periodically