

COURSE SPECIFICATIONS

Form

Course Title: **Water Treatments and Purifications**

Course Code: **4026850-3**



Date: 14-12-2019

Institution: Umm Al-Qura University.

College: Faculty of Applied Science

Department: Department of Chemistry

A. Course Identification and General Information

1. Course title and code: **Water treatments and purifications / 4026850-3**

2. Credit hours: **3 hrs. (Theoretical)**

3. Program(s) in which the course is offered. **M. Sc. in Chemistry**

(If general elective available in many programs indicate this rather than list programs)

4. Name of faculty member responsible for the course: **Prof. Amr Lotfy Saber**

5. Level/year at which this course is offered: **3rd / 2nd**

6. Pre-requisites for this course (if any): **not applicable**

7. Co-requisites for this course (if any): **not applicable**

8. Location if not on main campus: **El-Abedyah, El-Azizya, and El-Zaher**

9. Mode of Instruction (mark all that apply):

- | | | | |
|-------------------------------------|-------------------------------------|-------------|---------------------------------------|
| a. Traditional classroom | <input type="checkbox"/> | percentage? | <input type="checkbox"/> |
| b. Blended (traditional and online) | <input checked="" type="checkbox"/> | percentage? | <input type="checkbox" value="100%"/> |
| c. E-learning | <input type="checkbox"/> | percentage? | <input type="checkbox"/> |
| d. Correspondence | <input type="checkbox"/> | percentage? | <input type="checkbox"/> |
| f. Other | <input type="checkbox"/> | percentage? | <input type="checkbox"/> |

Comments:

B Objectives

1. The main objective of this course

By the end of this course student will be able to:

- 1- Know different water sources and its ability to renew.
- 2- Familiar with quality control and environmental pollutions and effect of the pollutants on human health.
- 3- Able to treat waste water using different methods of purification and tests of significance.

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

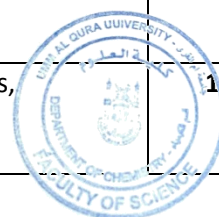
The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

Course Description:

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Requirement of water and sources	1	3
Water quality standards	1	3
Physico chemical parameters and significance-odor-temperature turbidity, density, solids, hardness, acidity and alkalinity	1	3
Dissolved oxygen-organic chemicals, solid substances and secondary drinking water standards	1	3
Determination of pH, CO ₂ , alkalinity (carbonate, bicarbonate)	1	3
Determination of hydroxide, chloride, fluoride, sulphate, and H ₂ S.	1	3
Determination of calcium, magnesium, sodium, potassium, iron (total ferrous and ferric), ammonia, nitrite and nitrate	1	3
Determination of phosphorous (total inorganic and organic), phenols, surfactants and pesticides	1	3



Mid term exam	1	3
Municipal or utility water treatment and on-site treatment	1	3
A brief idea of sedimentation, coagulation and flocculation	1	3
Water purification processes, corrosion and its control	1	3
Different methods for water purification to remove toxic compounds, refractory organics, dissolved inorganic substances	1	3

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	39	--	--	--	--	39
	Actual	39	--	--	--	--	39
Credit	Planned	3	--	--	--	--	3
	Actual	3	--	--	--	--	3

3. Individual study/learning hours expected for students per week.

3 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Cod e #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Know different water sources, quality control and data handling in analytical chemistry techniques and how to select the optimum samples	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems

1.2	Recognize the industrial pollutions present in water		<ul style="list-style-type: none"> • portfolios • long and short essays
1.3	Describe analytical chemistry in manufactures and found way for purification and corrosion control		
1.4	Familiar with the separation and purification methods for separate the pollutants		
1.5	Write selective industrial applications		
2.0	Cognitive Skills		
2.1	Develop the reverse think skills and predict the suitable methods for industrial pollutants separation from water samples	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • posters demonstrations
2.2	Create the different ideas for water treatment		
2.3	Explain the methods and ways of analytical chemistry – environmental analytical chemistry to remove industrial pollutions		
2.4	Explain the suitable method to determine the organic and inorganic pollutants in different water samples		
2.5	Plan for research program in water purification field		
2.6	Create briefly ideas for sedimentation, coagulation and flocculation		
	<p>Illustrate the suitable methods of water analysis in analytical chemistry and tests of significance</p> <p>Evaluate the optimal parameters to select the best analytical methods and purification procedures</p>		
3.0	Interpersonal Skills & Responsibility		
3.1	Develop the student's ability in self-reliance and responsibility.	<ul style="list-style-type: none"> • Dividing students into groups to carry out collective scientific reports. 	<ul style="list-style-type: none"> • Evaluate the results of collective works and duties as well
3.2	Choose the suitable method to solve problems.		

3.3	Operate in team work and accept his college's opinions.	<ul style="list-style-type: none"> • Periodic individual duties to develop the skill of taking responsibility and self-reliance. 	<p>as knowing the contribution of each individual through dialogue and discussion.</p> <ul style="list-style-type: none"> • Assessment of individual tasks and duties to determine the student's ability to self-reliance.
4.0	Communication, Information Technology, Numerical		
4.1	Enhancing the ability of students to use computers and internet.	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • web-based student performance systems • individual and group presentations
4.2	Interpret chemical data		
4.3	Present chemical data orally.		
4.4	Know how to write a report.		
5.0	Psychomotor(if any)		
5.1	NOT APPLICABLE		
5.2			

5. Assessment Task Schedule for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Activities and Assignments.	--	10 %
2	Midterm Exam.	8	30 %
3	Final Exam.	15-16	60 %
4	Total		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E Learning Resources

1. List Required Textbooks

- R. Kellner, J. M. Mermet, M. Otto, M. Valcarcel and H. M. Widmer, *Analytical Chemistry*, 2nd edition, WILEY (2014)

<ul style="list-style-type: none"> • K. Danzer, <i>Analytical Chemistry, Theoretical and Metrological Fundamentals</i>, Springer(2014) • Industrial water pollution control, 3rd ed, W. Wesley Eckenfelder, Jr., McGraw-Hill, Inc., 2000 • Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, <i>Analytical Chemistry</i>, 7th edition, WILEY (2014) • Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, <i>Analytical Chemistry</i>, 7th edition, Springer (2014) • DhruvaCharan Dash. <i>Analytical Chemistry</i> (2017) PHI Learning Private Limited.
<p>2. List Essential References Materials (Journals, Reports, etc.)</p> <ul style="list-style-type: none"> • Lecture Hand outs available on the coordinator website
<p>3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.</p> <ul style="list-style-type: none"> • http://www.chemweb.com • http://www.sciencedirect.com • http://www.rsc.org
<p>4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.</p>

F. Facilities Required

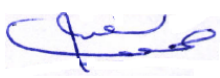
<p>Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)</p>
<p>1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)</p> <ul style="list-style-type: none"> • Classrooms capacity (30) students. • Providing hall of teaching aids including computers and projector.
<p>2. Technology resources (AV, data show, Smart Board, software, etc.)</p> <ul style="list-style-type: none"> ▪ Room equipped with computer and projector and TV.
<p>3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)</p> <ul style="list-style-type: none"> • No other requirements.

G Course Evaluation and Improvement Procedures

<p>1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none"> • Complete the questionnaire evaluation of the course in particular.
<p>2. Other Strategies for Evaluation of Teaching by the Instructor or the Department</p> <ul style="list-style-type: none"> • Observations and the assistance of colleagues. • Independent evaluation forextent toachieve students the standards. • Independent advice of the duties and tasks.
<p>3. Procedures for Teaching Development</p> <ul style="list-style-type: none"> • Workshops for teaching methods. • Continuous training of member staff. • Review of strategies proposed. • Providing new tools for learning. • The application of e-learning. • Exchange of experiences internal andexternal.

4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution)
- Check marking of a sample of exam papers, or student work.
 - Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it.
- Periodic review of the contents of the syllabus and modify the negatives.
 - Consult other staff of the course.
 - Hosting a visiting staff to evaluate of the course.
 - Workshops for teachers of the course.

Name of Course Instructor: Prof. Amr Lotfy Saber

Signature: 

Date Completed: 14 /2/2019

Program Coordinator: Dr. Ismail Ibrahim Althagafi

Signature: 

Date Received: 15 /2/2019

