

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



COURSE SPECIFICATION
(General Chemistry, 402101-4)
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: General Chemistry, 402101-4
2. Credit hours: Four (3 theoretical + 1 practical) hrs.
3. Program(s) in which the course is offered (If general elective available in many programs indicate this rather than list programs): Pure and Industrial Chemistry
4. Name of faculty member responsible for the course: Dr. Sayed Zaki Mohammady
5. Level/year at which this course is offered: 3rd / 2
6. Pre-requisites for this course (if any): -----
7. Co-requisites for this course (if any): -----
8. Location if not on main campus: -----

B. Objectives

<p>1. Summary of the main learning outcomes for students enrolled in the course.</p> <p>This course is an introductory chemistry course designed to prepare students for college level chemistry courses. The course introduces some basic principles of chemical problems solving.</p>
<p>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).</p> <ul style="list-style-type: none">• The use of teaching intelligent classes for lectures.• Encourage students to prepare reports in general topics in chemistry.• The use of information technology or the Internet in order to increase awareness of the concepts of chemistry.• Link the theoretical and practical sides of the course to help the students to understand and interpret the properties of the chemical compounds.

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		
Topic	No of Weeks	Contact hours
States of matter and measurement, molecules and molecular compounds.	1	3
Units of measurements; SI- units, intensive and extensive properties, uncertainty in measurements (precision and accuracy).	1	3
Significant figures: Rounding significant figures, Using significant figures in addition, subtraction, multiplication and divisions.	1	3
The periodic table, nomenclature, electronic structure of atoms, simple periodic properties of the elements.	2	3
Chemical bonding, molecular geometry, and properties of various states of matter.	2	6
Ions and ionic compounds, chemical reaction types.	1	3
Stoichiometry, atomic and molecular weights.	1	3
The mole, simple quantitative calculations with chemical reactions.	1	3
Basics of chemical equilibrium.	1	3
Acids and bases.	1	3
Thermochemistry.	1	3
Hydrocarbons, nomenclature and simple reactions.	1	3

Laboratory Experiments Outline

Topics to be Covered		
List of Experiments	No of Weeks	Contact hours
The practical part includes the following experiments:		
Introduction	1	3
Density and viscosity of liquids.	1	3
Compound type (polar – nonpolar – ionic).	1	3

Chemical reactions.	1	3
Acids and bases and pH measurements and calculations.	1	3
Titration of vinegar.	1	3
Oxidation-reduction reactions.	1	3
Molar mass of acid.	1	3
Qualitative analysis (acidic and basic radicals).	1	3
Colligative properties (determination of molecular weight).	1	3
Determination of the heat capacity of the calorimeter.	1	3
Determination of the critical solution temperature of phenol - water system	1	3
Review	1	3
Final Exam.	1	3

2. Course components (total contact hours per semester):			
Lecture:	Tutorial:	Practical/Fieldwork/Internship:	Other:
42	---	42	

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)
- 26 hours (2 hrs per week office hrs).

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.

After finishing this course students will be able to:

- investigate the different states of matter and measurement.
- calculate the mole, simple quantitative calculations with chemical reactions to understand the nature and significance molecules and compounds.
- distinguish between molecules and molecular compounds.
- interpret experimental results.
- handle the periodic table.
- torelate structure and properties
- understand the nomenclature, electronic structure of atoms, simple periodic properties of the elements.
- distinguish the different types of chemical bonding.
- understand orientation and molecular geometry, and properties of various states of matter.
- investigate the acids and bases.
- calculate the pH values in acids and bases.
- understand viscous and elastic elements of a polymer
- investigate the factors affecting the thermal characteristics of a reaction.
- calculate the chemical equilibrium constants and factors affecting them.

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

- Scientific discussions during the lectures.
- The use of library work duties and a small research work.
- Resolve problems presented during lectures homework.
- Use of the internet to prepare some reports about general topics in chemistry.

(iii) Methods of assessment of knowledge acquired

- The final written examinations and the middle of the semester.

b. Cognitive Skills

(i) Description of cognitive skills to be developed

By the compilation of this course, students will be able to :-

- Analyse the data related to different topics in chemistry.
- Solve problems related to different chemical subjects.
- Select and apply the appropriate technique of work at the laboratory.

- Interpret experimental results.

(ii) Teaching strategies to be used to develop these cognitive skills

- To generate discussion in the classroom.
- Examples are given in the lecture and exercises in the workshops.
- Give some of the issues and ask the students applied to finding a strategic plan to resolve.
- Encourage the transfer of learning using the tools of analysis in different applications and through discussion of potential applications in other areas.
- Students assigned duties that include the functions of open tasks designed for the application of skills forecasting and analysis and problem solving.

(iii) Methods of assessment of students cognitive skills

- Tests.
- Measure the response of the assignments.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Develop the necessary skills of writing and English conversation as a good for the connection of sciences.
- Act responsibly in personal and professional relationships.
- Act in responsible ethical manner.
- Ability of self-learning using learning recourses and websites.
- Improve and develop analytical capabilities for solving the problems and ideas.
- The ability to work effectively individually and in team.

(ii) Teaching strategies to be used to develop these skills and abilities

- The development of substantive discussions in the classroom.
- Improve student performance to conduct research on the World Wide Web (Internet).
- Assignment and homework exercises.
- Improve student performance in practice their duties and responsibilities to topics.
- Laboratory work, special assignments and search for data and information on their own.

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

- Give the exercises in the classroom.
- Evaluation of homework for students
- The performance of duties by groups and then corrected for each other.
- Observation of student ethical and moral behaviour.
- Evaluation of the interaction of students in the classroom.

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain.

On completion of this course, students will be able to :-

- Communicate link between the science of kinetic chemistry and other sciences related.
- Develop the skills to deal with the problems of numerical calculations and laws.
- Research on the Internet for various topics related to the course.
- Solve exercises and questions related to increase their numerical and statistical skills.
- Work in a group to discuss issues of domestic duties and their meanings and objectives.
- Make good and clear discussion on the basic concepts of chemistry.

(ii) Teaching strategies to be used to develop these skills

- Duties focused on the development of numerical capacity of the students.
- Short presentations for various topics related to the curriculum research paper depend on the use of internet.
- Encourage collective discussion among the students in the classroom.

(iii) Methods of assessment of students numerical and communication skills

- Marks given to for good reports and presentations.
- Seminar evaluation.
- Evaluation of student essay and assignments.

e. Psychomotor Skills (if applicable)

(i) Description of the psychomotor skills to be developed and the level of performance required

- Collect, record, and analyse data using appropriate techniques in the laboratory.
- Undertake laboratory investigations in responsible and follow safety regulations.
- Demonstrate the necessary skills to work safety and competently in practical situations.

<ul style="list-style-type: none"> Analyse and critically evaluate experimental data.
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> Laboratory classes involving all aspect of practical and professional skills. Engage student in analysis and evaluation of their practical work.
<p>(iii) Methods of assessment of students psychomotor skills</p> <ul style="list-style-type: none"> Laboratory exams and reports. Practical final exam and oral test. Coursework reports.

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	20%
3	Lab Activity and Final Exam on Lab	Throughout the Term	30%
4	Final Exam	End of the Term	40%
5	Total		100%

D. Student Support

<p>1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)</p> <ul style="list-style-type: none"> Presence of faculty members to provide counselling and advice. Office Hours: weekly during working hours, and to create appropriate means. Academic Advising for students to those who need it, and taking into account the appropriate test for that Member.
--

E Learning Resources

1. Required Text(s) <ul style="list-style-type: none">Lecture notes prepared by the lecturer.
2. Essential References <ul style="list-style-type: none">General Chemistry, E. B. Gallogly, 4th edition, D. A. Mcquarrie, P. A. Rock, University Science books, Mill Vally, 2011.General, Organic and Biochemistry, 4th Edition, K. Denniston, J. Topping and R. Caret, R.; General, Organic and, McGraw Hill, 2004.
3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) <ul style="list-style-type: none">Chemistry, R. Chang, 10th Edition, McGraw-Hill Higher Education, 2011.
4. Electronic Materials, Web Sites etc <ul style="list-style-type: none">Power point lectures.
5. Other learning material such as computer-based programs/CD, professional standards <ul style="list-style-type: none">Microsoft PowerPoint, Microsoft Word

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) <ul style="list-style-type: none">Classroom capacity (60) students.To supply the classrooms with the appropriate educational means.
2. Computing resources <ul style="list-style-type: none">Hall is equipped with a computer and Data Show and TV.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) <ul style="list-style-type: none">None

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching <ul style="list-style-type: none">Complete the questionnaire assessment due in particular.

<ul style="list-style-type: none"> • Focus group discussions with small groups of students.
<p>2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department</p> <ul style="list-style-type: none"> • Observations and assistance of colleagues. • Independent evaluation of the extent to which students of the standards. • Independent advice to the duties and tasks.
<p>3. Processes for Improvement of Teaching</p> <ul style="list-style-type: none"> • Workshops to teaching methods. • Ongoing training of faculty member. • Review the proposed strategies. • Providing modern tools necessary for learning. • Application of the means of e-learning. • The exchange of internal and external expertise.
<p>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</p> <ul style="list-style-type: none"> • Examination of a sample of the patch test papers, or student work, which has been corrected by a faculty member. • Exchange a sample of assignments or tests on a regular basis between faculty members of the same course in other educational institution.
<p>5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> • Consult the other professors of the course. • Host a visiting professor to evaluate the course. • Workshops for professors of the course. • Periodic review of the contents of the course and amend the negatives.