

**ATTACHMENT 5.**

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

**T6. Course Specifications**  
**(CS)**

## Course Specifications

Institution	<b>King Khalid University</b>	Date : 21-4-2016
College/Department : Joint Program/ Science		

### A. Course Identification and General Information

1. Course title and code: General Chemistry (Chem. 107)			
2. Credit hours : Theoretical + Practical (3 + 1)			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Bachelor Degree in Engineering.			
4. Name of faculty member responsible for the course Chemistry Staff Members.			
5. Level/year at which this course is offered : Level 1 / First year			
6. Pre-requisites for this course (if any) : None			
7. Co-requisites for this course (if any) : None			
8. Location if not on main campus : Academic Campus in Mahala.			
9. Mode of Instruction (mark all that apply)			
a. traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="100"/>
b. blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments: None			

## B Objectives

### 1. What is the main purpose for this course?

Chemistry 107 is a general introduction to chemistry course that incorporates both lectures and laboratory experiments in developing and understanding chemical concepts and practices.

After teaching of that course the students must have the following skills:

- 1- Identification of matters and measurement, properties of substances, significant figures and uncertainty in measurements.
- 2- Identification of atoms and atomic structure and electronic configuration.
- 3- Identification of Mass relations in Chemistry, molecular mass, simplest formula, molecular formula, structural formula, mass relation in reactions
- 4- Identification of Gases, Ideal gases, Gas law, Avogadro's low, Dalton's Law of Partial Pressure, Kinetic Theory of Gases,
- 5- Identification of Liquids, Solids and Intermolecular Forces, Equilibria between phases and Properties of Liquids
- 6- Acquiring knowledge about Electronic Structure of Atoms, Electromagnetic Radiation, The Quantum Theory, The Bohr's Theory, The Modern Theory of Atomic Structure, Electronic Configuration, Ionization Energy
- 7- Identification of Covalent bonding, Lewis structures, octet rule, molecular geometry.

Weekly laboratory experiments emphasize quantitative techniques and complement the lecture material.

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

- 1- Using different strategic teaching (white board and power point presentation)
- 2- Updating the contents of the syllabus
- 3- Activation the blackboard

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

### 1- Topics to be Covered

List of topics (Theoretical)	No of Weeks	Contact hours
• <b>Matter</b> – Its Properties and Measurements: Types of Matter, Quantities and SI-units, Uncertainty and Significant Figures.	1	3

<ul style="list-style-type: none"> <li>• Atoms and the atomic theory, Dalton's theory, Modern view of atomic structure, Isotopes, Introduction to the periodic table, Molecular Formula, Empirical or Simplest Formula, Structural Formula, Formula of ionic compounds.</li> </ul>	3	9
<ul style="list-style-type: none"> <li>• <b>Mass Relations in Chemistry:</b> Mole, Molecular Mass, Simplest Formula from Chemical analysis, Molecular Formula from Simplest Formula and Mass Relations in Reactions.</li> </ul>	3	9
<ul style="list-style-type: none"> <li>• <b>Gases:</b> Properties of Gases, The Simple Gas Laws, The Ideal Gas Equation and The General Gas Equation, Mixtures of Gases, Dalton's Law of Partial Pressure, Graham's Law, Real Gas and van der Waals Equation.</li> </ul>	3	6
<ul style="list-style-type: none"> <li>• <b>Liquids, Solids and Intermolecular Forces:</b> Properties of Liquids, Vaporization of Liquids, Vapor Pressure, Some Properties of Solids, Phase Diagrams, Van der Waals Forces, Hydrogen Bonding, Chemical Bonds as Intermolecular Forces.</li> </ul>	2	6
<ul style="list-style-type: none"> <li>• <b>Electronic Structure of Atoms:</b> Electromagnetic Radiation, The Quantum Theory, Bohr's Theory, De-Broglie Principal, The Modern Theory of Atomic Structure, Pauli Exclusion Principle, Hund's Rule, Electronic Configuration, Isolelectronic, Trends in the Properties of Atoms in Periodic Table, Atomic Radius, Ionic Radius of ions, Ionization Energy, Electronegativity.</li> </ul>	2	6
<ul style="list-style-type: none"> <li>• Covalent bonding, Lewis structures, octet rule, molecular geometry.</li> </ul>	1	3
<b>List of topics (Practical)</b>		
<ul style="list-style-type: none"> <li>• Identification the safety rules in laboratory</li> </ul>	1	2
<ul style="list-style-type: none"> <li>• Determination the density of liquid and solid substances</li> </ul>	1	2
<ul style="list-style-type: none"> <li>• Determination the viscosity of organic liquid</li> </ul>	1	2
<ul style="list-style-type: none"> <li>• Identification the acidic radicals of the salts</li> </ul>	2	4
<ul style="list-style-type: none"> <li>• Identification the basic radicals of the salts</li> </ul>	2	4
<ul style="list-style-type: none"> <li>• Scheme for identification the acidic and basic radicals of the salts</li> </ul>	2	4
<ul style="list-style-type: none"> <li>• Preparation of sodium carbonate (<math>\text{Na}_2\text{CO}_3</math>) and sodium bicarbonate (<math>\text{NaHCO}_3</math>) solutions</li> </ul>	1	2
<ul style="list-style-type: none"> <li>• Separation of a mixture containing <math>\text{NaCl}</math>, <math>\text{SiO}_2</math>, and <math>(\text{NH}_4)_2\text{CO}_3</math></li> </ul>	1	2
<ul style="list-style-type: none"> <li>• Determination the value of general gas constant (R)</li> </ul>	1	2
<ul style="list-style-type: none"> <li>• Determination the molecular weight of volatile liquid</li> </ul>	1	2
<ul style="list-style-type: none"> <li>• Revision</li> </ul>	1	2
<ul style="list-style-type: none"> <li>• Exam.</li> </ul>	1	2

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	<b>40</b>	<b>0</b>		<b>30</b>		<b>70</b>
Credit						

3. Additional private study/learning hours expected for students per week.	<b>3h/w</b>
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#### 4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

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 intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	1-Identification of matters and measurement, properties of substances, significant figures and uncertainty in measurements.	1. Each lecture emphasis the concept to be covered and the details of this concept.	Mid-term exams, final exam, homework, quizzes and discussions.
1.2	Identification of atoms and atomic structure and electronic configuration.	1. Lectures. 2. Discussions in lectures and try to engage students	Mid-term exams, final exam, homework, quizzes and discussions
1.3	Identification of Mass relations in Chemistry, molecular mass, simplest formula, molecular formula, structural formula, mass relation in reactions.	1. Lectures. 2. Many problems to be discussed and solved by the students.	Mid-term exams, final exam, homework, quizzes and discussions.
1.4	Identification of Gases, Ideal gases, Gas law, Avogadro's low, Dalton's Law of Partial Pressure, Kinetic Theory of Gases,	1. Lectures 2. Many problems to be discussed and solved by the students.	Mid-term exams, Final exam, homework, quizzes, discussions.
1.5	Identification of Liquids, Solids and Intermolecular Forces, Equilibria between phases and Properties of Liquids.	1. Each lecture emphasis the concept to be covered and the details of this concept.	Mid-term exams, Final exam, homework, quizzes, discussions.
1.6	Acquiring knowledge about Electronic Structure of Atoms, Electromagnetic Radiation, The Quantum	Lectures 2. Many problems to be	Mid-term exams, final exam, homework, quizzes and

	Theory, The Bohr's Theory, The Modern Theory of Atomic Structure, Electronic Configuration, Ionization Energy	discussed and solved by the students	discussions.
1.7	Identification of Covalent bonding, Lewis structures, octet rule, molecular geometry.	1. Each lecture emphasis the concept to be covered and the details of this concept	Mid-term exams, final exam, homework, quizzes and discussions.
<b>2.0</b>	<b>Cognitive Skills</b>		
2.1	<b>Description of cognitive skills to be developed</b> Identification the matter, types of matter, atomic structure, and organic compounds.		
2.2	<b>Teaching strategies to be used to develop these cognitive skills</b> 1- Explain different examples of matter 2- Different web sites on the internet explain the atomic structure 3- Many text books in library demonstrate the importance of organic compounds		
2.3	<b>Methods of assessment of students cognitive skills</b> Mid-term exams and final exam including some questions such as (Explain, discuss, comment, compare, .....etc)		
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	<b>Description of the interpersonal skills and capacity to carry responsibility to be developed</b> 1- Self-teaching for the students 2- Research on the internet		
3.2	<b>Teaching strategies to be used to develop these skills and abilities</b> Homework depending on search in the internet		
3.3	<b>Methods of assessment of students interpersonal skills and capacity to carry responsibility</b> Evaluation of the homework		
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	<b>Description of the skills to be developed in this domain</b> 1-Using the computer 2-Practical skills		
4.2	<b>Teaching strategies to be used to develop these skills</b> Homework and lab tests		
4.3	<b>Methods of assessment of students numerical and communication skills</b> Evaluation of the homework through black board and laboratory skills		
<b>5.0</b>	<b>Psychomotor (none)</b>		
5.1			
5.2			

5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes (Use Program LO Code #s provided in the Program Specifications)									
	1.1	1.2	1.3	2.1	2.2	3.2	3.3	4.1	4.2	
1.1										

2.1									
1.3									
2.1									
2.2									
3.2									
3.3									
4.1									
4.2									

#### 6. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	First Mid-term exam	6	10 %
2	Second Mid-term exam	11	10 %
3	Homework on black board	Continuous	5 %
4	Practical tests	The week before the end of semester	25 %
5	Final Exam	End of semester	50%

#### D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)  
Office hours (10 hours per week).

#### E Learning Resources

1. List Required Textbooks  
Ralph H. Petrucci, William S. Harwood, and F. Geoffrey Herring, "General Chemistry, Principles and Modern Applications", 10<sup>th</sup> Edition, Prentice Hall, 2009.
2. List Essential References Materials (Journals, Reports, etc.)
  - 1- Catherine E. Housecroft, Edwin C. Constable, "Chemistry: An Introduction to Organic, Inorganic and Physical Chemistry", 3<sup>rd</sup> Ed., Pearson Education Limited, 2006.
  - 2- Theodore L. Brown, H. Eugene LeMay, Jr, Bruce E. Bursten, "Chemistry: The Central Science", 10<sup>th</sup> Ed., Pearson Education, Inc., 2006.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Attached list
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. <b>Electronic references – web sites</b>
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. Power point – Projector.

#### F. Facilities Required

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.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Class room, laboratory with equipment.
2. Computing resources (AV, data show, Smart Board, software, etc.) Data Show
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) None

#### G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching  Evaluation sheet from the students including (Contents – Teaching Staff – Teaching process)
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Report from Chairman of Chemistry Department.
3 Processes for Improvement of Teaching 1- Meeting of different levels of students under supervision of teaching stuff. 2- Search on internet.



4. Processes for Verifying Standards of Student Achievement (e.g. 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)

Verifying standards of student achievement by selection of different grads of students (High, medium, and low grads).

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- 1- Recent publications from internet.
- 2- Web sites.

Name of Instructor: \_\_Saifeldin M. Siddeeg and Faouzi Ben Rebah\_\_\_\_\_

Signature: \_\_\_\_\_ Date Report Completed: \_\_21/04/2016\_\_

Name of Field Experience Teaching Staff \_\_\_\_\_

Program Coordinator: \_\_\_\_\_

Signature: \_\_\_\_\_ Date Received: \_\_\_\_\_