Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

Course Specification
General & Organic Chemistry (CHEM 103)
Course Number: 0925453

Institution	Dammam University
College/Department	Basic Health Sciences (The preparatory year for students of the Health Sector)

A: Course Identification & General Information	
1.Course title and code	General & Organic Chemistry (CHEM 103)
2.Credit hours	3 (2+1)
3.Program(s) in which the course is offered	Bachelor Degree in Health and Medical Sciences
4.Name of faculty member responsible for the course	Staff of Department of Chemistry
5.Level/year at which this course is offered	Year 1, Semester 1& Semester 2
6.Pre-requisites for this course	High School in Science
7.Co-requisites for this course	None
8.Location	Colleges of Basic Medical Sciences

B: Objectives

B1: Summary of the main learning outcomes for students enrolled in the course.

On completion of the course, students will be able to:

- Describe the basic principles of chemistry and its application in medical fields.
- Describe the principles of organic chemistry and its application in medical fields.

B2: 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)

- Not Applicable

C: Course Description

C1: Topics and Practical to be Covered

General Chemistry Topic (First Semester)	**Week #**	**Contact Hrs.**
Chapter (01): Matter and Measurement	1	1
Chapter (02): Atoms and the Periodic Table	2-3	2
Chapter (03): Ionic Compounds	4-5	2
Chapter (04): Covalent Compounds	6-7	2
Chapter (05): Chemical Reactions	8-9	2
Chapter (07): Gases, Liquids, and Solids	10-11	2
Chapter (08): Solutions	12-13	2
Chapter (09): Acids and Bases	14-15	2
Organic Chemistry Topic (Second Semester)	**Week #**	**Contact Hrs.**
Chapter (11): Introduction to Organic Molecules and Functional Groups	1	1
Chapter (12): Alkanes	2-3	2
Chapter (13): Unsaturated Hydrocarbons	4-5-6	3
Chapter (14): Organic Compounds That Contains Oxygen, Halogens, and Sulfur	7-8	2
Chapter (16): Aldehydes and Ketones	9	1
Chapter (17): Carboxylic Acids, Esters, and Amids	10-11	2

Chapter (18): Amines and Neurotransmitters	12	1
Chapter (19): Lipids	13	1
Chapter (20): Carbohydrates	14	1
Chapter (21): Amino Acids, Proteins, and Enzymes	15	1
Practical [First and/or Second Semester (s)]	**Week #**	**Contact Hrs.**
Safety and laboratory regulations.	1	2
Densities of some common materials.	2	2
Molar and mass relationships in chemical reactions.	3	2
Oxidation states.	4	2
Relationships between chemical structures and physical properties.	5	2
Water, its properties and reactions.	6	2
Qualitative analysis (anions and cations).	7	2
Chemical equilibrium.	8	2
pH measurements.	9	2
Melting and Boiling point determinations.	10	2
Separation of mixture by solvent extraction and crystallization.	11	2
Electrophilic aromatic substitution.	12	2
Preparation of aspirin.	13	2
Carbohydrates	14	2
Organic qualitative analysis.	15	2

C2: Course Components (Total contact hours per semester)

Lectures	Practical
15	30 (2nd Semester only)

C3: 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.)

- none

C4: Development of Leaning Outcomes in Domains of Learning. For each of the domains of learning shown below, please indicate

C4a: Knowledge

(i)Description of the knowledge to be acquired

- Principle of chemistry.
- The state of matter.
- Bonding in chemical compounds
- Various types of chemical reaction
- Equilibrium and its importance in chemical reactions.
- Various types of organic compounds and their derivatives.
- The reactions of organic compounds and their importance in medical study.
- The structure of organic compounds to their biological importance

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

- Teaching using PowerPoint presentations (PPS & PPT).
- Independent and self-learning and assignments
- Problem based learning (PBL).

(iii)Methods of assessment of knowledge acquired

- Continuous Assessment – Course work + Two quizzes (7th and 22nd weeks), which will be composed of MCQs, matching questions and fill in the blank.
- Final Theoretical Exam (at the end of each semester), which will be composed of MCQs,matching questions and fill in the blank

C4b: Cognitive Skills

(i)Students would be expected to achieve the following knowledge and skill outcomes:

- Demonstrate an understanding of energy changes and gain knowledge of atomic and molecular structure to predict chemical bonding and reactivity.
- Explain the various types of chemical reaction
- Define equilibrium and its importance in chemical reactions.
- List the various types of organic compounds and their derivatives.
- Describe the reactions of organic compounds and their importance in our life.
- Relate the structure of organic compounds to their biological importance.

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

- Class and home activities.
- Small group discussions and teaching.
- Computer aided studies (HyperChem & ChemDraw programs).
- Molecular modeling & virtual techniques

(iii)Methods of assessment of students' cognitive skills

- Continuous Assessment – Course work + Two quizzes (7^{th} & 22^{nd} weeks), which will be composed of MCQs, matching questions and fill in the blank.
- Final Theoretical Exam (at the end of each semester), which will be composed of MCQs,matching questions and fill in the blank

C4c: Interpersonal skills and Responsibility

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

- Participate effectively during classroom and group discussions
- Effectively express ideas
- Lead group discussions

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

- Oral discussions
- Tutorials
- Provide incentives for active participation
- Group assignments

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

- Presentation assessment
- Documentation of participation
- Observation of leading group discussions

C4d: Communication, Information Technology & Numerical Skills

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

- Listen to other points of view in order to effectively participate in group discussions
- Express one's point of view in a clear and concise manner
- Interpret numerical data
- Use information technology to obtain information

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

- Model effective listening and communication skills
- Use of problem based group discussions
- Assignments which require a web-based search

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

- Assignment reports
- Observation of group discussions
- Documentation of participation

C4e: Psychomotor Skills (If applicable)

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

- Conduct experiments in chemistry under supervision

- Acquire the skills to evaluate experimental data,
- Show skills to explain observed chemical behavior using the principles of structure, bonding and reactivity.

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

- Observation of experiments being conducted
- Virtual laboratory sessions
- Conduct experiments

(iii)Methods of assessment of students psychomotor skills

- Assignment reports
- Observation during laboratory sessions
- Accuracy of the obtained data

C5. Schedule of Assessment Tasks for Students during the Semester

#	Assessment Task	Week Due	Proportion of Final Assessment
1	First Quiz (first semester)	07	15%
2	Second quiz (second semester)	22	15%
3	Laboratory teaching (second semester)	Periodical	20%
4	Final 1st & Final 2nd semester Examinations	15 and 30	50%
	Total		100%

D. Student Support

Arrangements for availability of faculty for individual student consultations and academic advice (include amount of timefaculty are available each week for consultation)

- Each faculty member assigns office hours for student consultation (8 hours per faculty member per week)
- e-mail correspondence

E. Learning Resources

1.Required Text:

- **General, Organic, & Biological Chemistry** by Janice G. Smith, 2nd Edition, McGraw Hill Company, Boston, New York, USA.

2.Essential References

- A selection of books which pertain specifically to the topics of chemistry and molecular biology will be assigned. These books will include:
  - Chemistry
  - Practical Chemistry
  - Molecular biology & biotechnology

3.Recommended Books and Reference Material (Journals, Reports, etc)

- **Chemistry** by Raymond Chang, 7th Edition, McGraw Hill Company, Boston, New York, USA.
- **Organic Chemistry**, a short course, Hart, Craine, Hart &Hadad, 12th Edition, Houghton Mifflin Company, Boston, New York, USA.
- Introduction to Chemistry (A Foundation) by S. S. Zumdahl& D. J. DeCoste, 7th Edition, Cengage Learning, USA.

4.Electronic Materials, Web Sites etc.

- www.mhhe.com
- www.college.hmco.com/pic/hart12e
- www.cengage.com
- www.bmjbooks.com

- www.ucl.ac.uk/lifesciences
- www.gla.ac.uk

5.Other learning material such as computer-based programs/CD, professional standards/regulations

- Handout and Lecture notes.
- Chemistry laboratory manual.
- HyperChem 6 and ChemDraw programs.
- Molecular Modles.

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 (Lecture room, laboratoires, etc.)

- Lecture halls.
- Classrooms with multimedia facilities.
- Laboratories.

2.Computing Resources

- Different programs should be Available.
- Data show should be available in each class & Video for video presentation.

3.Other Resources

- None

G. Course Evaluation and Improvement Processes

1.Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Student Surveys
- Analysis of exam and quiz results
- Analysis of assignments

2.Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Peer review and discussion
- Benchmarking

3.Processes for Improvement of Teaching

- Attending workshops, conferences and seminars related to education
- Attendance of colleagues' lectures

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

- A sample of the students' work will be rechecked by an independent reviewer
- The use of external examiners
- Exam analysis

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

- Mid of Semester survey
- End of Semester survey