Course Specification
(Bachelor)

Course Title:	**Inorganic Chemistry (1)**
Course Code:	**CHM 1211**
Program:	**Bachelor of Science in Chemistry**
Department:	**Chemistry**
College:	**Science**
Institution:	**Imam Mohammed Ibn Saud Islamic University**
Version:	**2024 V1**
Last Revision Date:	12 October 2024

Table of Contents

A. General information about the course:

-1. Course Identification

1. Credit hours: (4)					
4 (1 Lectures, 3 Lab, 2 Tutorials)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: Level 3/ year 2					
4. Course general Description:					
In this module students will study the elements of the periodic table in their different groups, alkali metals, halogens, s and p-block, inert gases, relation of properties with the position in the periodic table. The experimental part of this module deals with the identification of some anions and cations.					
5. Pre-requirements for this course (if any)**:**					
General Chemistry (2) CHM 1102					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					

At the end of the course, Students should be able to:

- **Gain knowledge of the basic information of s and p block elements and inert gases.**
- **Acquire preparation methods of s and p block elements and their uses.**

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**90**	**100%**
2	E-learning	**0**	**0**
3	Hybrid • Traditional classroom • E-learning	**0**	**0**
4	Distance learning	**0**	**0**

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	**15**
2.	**Laboratory/Studio**	**45**

3.	**Field**	**0**
4.	**Tutorial**	**30**
5.	**Others (specify)**	**0**
Total		90

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**To outline groups of elements.**	**K1; K3**	▪ Lectures ▪ group discussion	▪ Quizzes ▪ Homework
1.2	**To define the properties and describe the preparation methods of elements and compounds of groups I-VIIA.**	**K1; K3**	▪ Lectures ▪ group discussion ▪ laboratory experiments	▪ Homework ▪ Exams ▪ laboratory reports
1.3	**To list different uses and applications of inorganic compounds.**	**K1; K2**	• Lectures • Laboratory experiments	▪ Quizzes and homework ▪ Group discussions
1.4	**To name the principles of safety, list emergency responses, and outline the routes of exposures to hazards, the minimization, and controlling and laboratory management.**	**K4**	• Lectures, • Laboratory experiments • Group discussions	▪ Quizzes ▪ Homework ▪ Group discussions
2.0	Skills			
2.1	**To explain the specific properties of elements according to their position in the periodic table.**	**S1**	• Group discussions • Homework • Mini reports • Virtual labs and demonstrations	• Presentation marks • Oral tests • lab sheets • Assessments and homework

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	**To summarize groups of elements and their respective compounds.**	**S3; S2**	• Group discussions • Laboratory experiments	Oral questions marks and laboratory reports
2.3	**To evaluate the components of ionic compounds.**	**S1; S3**	• Group discussions • Laboratory experiments • Brainstorming	• MCQs • Laboratory performance • Laboratory reports and sheet
2.4	**To illustrate experimentally obtained data during laboratory classes and field tasks and to demonstrate oral and network communication and technical writing skills.**	**S2; S3; S4;**	▪ Group discussion and assignments ▪ Demonstrations and laboratory manuals ▪ Presentations, demonstrations and virtual labs. • Encourage studens to use electronic mail to submit homeworks and assignments	▪ Oral tests and assignments marks ▪ Laboratory performance ▪ Laboratory performance and report ▪ Assignments and homework
3.0	Values, autonomy, and responsibility			
3.1	**To appraise teamwork, adapt to the work environment culture, and link theoretical study with practical reality.**	**V1;V2**	• Group discussions • Homework • Mini reports	• Presentation marks • Oral tests • Assessments and homework
3.2	**To show effective awareness to maintain scientific integrity during different assessments, projects, and mini-reports**	**V2**	• Group discussions • Homework • Mini reports	• Presentation marks • Oral tests • Assessments and homework

C. Course Content

No	List of Topics	Contact Hours
1.	• Review on The elements and their compounds: Periodic trends, Valence electron configurations, • Hydrogen: The hydrogen ion (proton), The hydride ion, Isotopes of hydrogen, protonium and deuterium, Deuterated compounds, Tritium, Dihydrogen. • Group 1: The alkali metals and their compounds: Introduction, Occurrence, extraction and uses, Extraction, Major uses of the alkali metals and their compounds, Physical properties and General properties. • Group 2: The alkali earth metals and their compounds: Introduction, Occurrence, extraction and uses, Major uses of the group 2 metals and their compounds, Physical properties and General properties.	15
2.	• Group 13: elements and their compounds: Introduction, Occurrence, extraction and uses, Major uses of the group 13 elements and their compounds, Physical properties, Electronic configurations and oxidation states. • Group 14: elements and their compounds: Introduction, Occurrence, extraction and uses, Occurrence, Extraction and manufacture, Uses, Physical properties, Ionization energies and cation formation, Some energetic and bonding considerations, Allotropes of carbon, Graphite and diamond: structure and properties.	9
3	• Group 15: elements and their compounds: Introduction, Occurrence, extraction and uses, Physical properties, Bonding considerations, Nitrogen, Phosphorus, Arsenic, antimony and bismuth. • Group 16: elements (Chalcogen) and their compounds: Introduction, Occurrence, extraction and uses, Physical properties and bonding considerations.	9
4	• Group 17 elements (Halogens) and their compounds: the Introduction, Fluorine, chlorine, bromine and iodine, Astatine, Occurrence, extraction and uses, Physical properties and bonding considerations, NMR active nuclei and isotopes as tracers, The elements, Difluorine, Dichlorine, dibromine and diiodine,, Hypofluorous acid, Oxoacids of chlorine, bromine and iodine and their aqueous solution chemistry • Group 18 elements (Noble Gas) : Introduction, Occurrence, extraction and uses, Physical properties, NMR active nuclei, Compounds of xenon, Fluorides, Chlorides, Oxides, Oxofluorides, Other compounds of xenon, Compounds of krypton and radon	12
Total		45

No	List of Experiments	Contact hours
1	Safety and Laboratory equipment's and measurements and How to make a report	3
2	Qualitative Analysis of HCl Group (CO_3^{-2}, HCO_3^-, S^{-2}, $S_2O_3^{-2}$, NO_2^- and SO_3^{-2})	3
3	Qualitative Analysis of H_2SO_4 Group, (Cl^-, Br^-, I^- and NO_3^-)	3
4	Qualitative Analysis of Miscellaneous Group, (SO_4^{-2}, $B_4O_7^{-2}$ and PO_4^{-3})	3
5	General Scheme of Acidic Radicals	3

6	Qualitative Analysis of Group I (Pb^{2+}, Hg^{+} and Ag^{+})	3
7	Qualitative Analysis of Group IIA (Cu^{2+}, Hg^{2+} , Cd^{2+} and Bi^{3+})	3
8	Qualitative Analysis of Group III, Al^{3+}, Fe^{2+}, Fe^{3+} and Cr^{3+}	3
9	Qualitative Analysis of Group IV Mn^{2+} , Co^{2+}, Ni^{2+} and Zn^{2+}	3
10	Qualitative Analysis of Group V (Ba^{2+}, Ca^{2+} and Sr^{2+})	3
11	Qualitative Analysis of Group VI (Mg^{2+}, K^{+} and Na^{+})	3
12	General Scheme of Basic Radicals	3
13	General Scheme of acidic and Basic Radicals	6
14	Revision	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam 1	Around 6th & 7th week	10 %
2.	Quizzes, Home Works, class participation, and mini-projects	Around 11th & 12th week	10%
3.	Laboratory	During the semester	10 %
4.		All the semester	30 %
5.	Final Exam	Around 16- 17th week	40 %
6.	Total		100 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	***Inorganic Chemistry,*** Catherine E. Housecroft and Alan G. Sharpe,. 2nd ED. Pearson Education Limited, Essex CM20 2JE, England, 2005 (ISBN: 0130-39913-2).
Supportive References	**Inorganic Chemistry,** Atkins, P., and Overton, T., Rourke, J., Weller, M., Armstrong, F. and Hagerman, M. 5th Ed. New York, NY: W.H. Freeman and Company, 2010 (ISBN: 978-1-42-921820-7).

	Laboratory Manual for Principles of General Chemistry, J. A. Beran,, 9th Edition, John Wiley & Sons Inc., 2004. (ISBN:9780470647899).
Electronic Materials	•Blackboard •http://highered.mcgrawhill.com/classware/ala.do?isbn=0073048518&alaid=ala_1136810&protected=true&showSelfStudyTree=true •http://www.chem1.com/acad/webtext/virtualtextbook.html •http://www.shodor.org/UNChem/index.html
Other Learning Materials	**None**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• Each of the class room should be equipped with a whiteboard and a projector, with a maximum of 20 students. • In each laboratory, a list of safety and precautions are provided. • In each lab has proper ventilation, and well equipped with instruments. • In each lab, containers for solid waste, liquid waste, and crushed glasses. • Each lab has a small pharmacy for first aid in case of an accident • In each lab, the rules, conditions, and safety mechanism as well list of Risk, Safety precautions according to Merck Catalogue are hanging in the labs
Technology equipment (projector, smart board, software)	The rooms are equipped with data show, Smart Board, WI-FI access.
Other equipment (depending on the nature of the specialty)	• Appropriate Glasswares for carrying the requested experiments (pipets, conical flasks, beakers, measuring cyliders, dishes, funnels, Buchner, Buchner flasks) • Appropriate fine chemicals and solvents (carbonate salts, sulphides salt, nitrate salts, chloride salts, bromide salts, iodide salts, sulphate salts, lead salts, mercury salts, silver salts, hydrochloric acid, sulfuric acid, silver nitrate, lead acetate) • Analytical balance (3 digits), Drying oven • Filter papers , clamps, stands

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Direct:** Questionnaire.
	Course Responsible	**Direct:** Course e-Portfolio. **Indirect:** Second examiner checklist-Course report.
	Peer Reviewer	**Direct:** Questionnaire. **Indirect:** External assessor report.
Effectiveness of Students assessment	**Program Leaders**	**Direct:** Course e-Portfolio. **Indirect:** Course report.
Quality of learning resources	**Students**	**Indirect:** Second examiner checklist-Course report.
	Faculty (Academic Advisory)	**Direct:** course Entrance/Exit. **Indirect:** Observations - Accreditation review.
	Program Leaders	**Direct:** Course e-Portfolio. **Indirect:** Course evaluation survey- Observations- Syllabus review- Accreditation review.
The extent to which CLOs have been achieved	**Course Responsible**	**Direct:** Exams - Course e-Portfolio. **Indirect:** Second examiner checklist-Course report.
	Program Leaders	**Indirect:** Exams.
Lab Performance	**Students** **Course Responsible**	**Direct:** Lab reports, Final Lab exam, Course e-Portfolio.

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**COUNCIL OF DEPARTMENT OF CHEMISTRY**
REFERENCE NO.	**7 (NO. 2/3)**
DATE	**29/3/1446 - 2/10/2024**