جامعة البحرين
University of Bahrain
مركز ضمان الجودة والاعتماد الأكاديمي
Quality Assurance and Accreditation Center

Academic Course Specification Form

استمارة توصيف المقرر الأكاديمي

القسم الخاص بالطالب
Section Concerning the Student

1. Course Code:	**CHEMY101**	**1. رمز المقرر:**
2. Course Title	General Chemistry I	**2. اسم المقرر:**
3. College:	Science	**3. الكلية:**
4. Department:	Chemistry	**4. القسم:**
5. Academic Program:	B.Sc.	**5. البرنامج الأكاديمي:**
6. Course Credits:	3-2-4	**6. عدد الساعات المعتمدة:**
7. Course NQF Level:	5	**7. مستوى المقرر وفقا للإطار الوطني للمؤهلات:**
8. Notional Hours:	149	**8. عدد الساعات الافتراضية:**
9. NQF Credits:	15	**9. عدد الساعات المعتمدة للمقرر وفقا للإطار الوطني للمؤهلات:**
10. Prerequisite:	None	**10. المتطلب السابق للمقرر:**
11. Lectures Timing & Location:	1:00-02:15 pm, S41-1017	**11. وقت المحاضرة ومكانها:**
12. General Mode of Teaching and Learning	Traditional تقليدي	**12. النمط العام للتعليم والتعلّم:**

13. Course Coordinator:	Dr. Mona Aljar, Dr. Wael Amer	**13. منسّق المقرر:**
14. Course Instructor:	Dr. Wael Amer	**14. مدرّس المقرر:**
15. Office Hours and Location:	U,T,H: 10–12 M,W: 11:00–12:00, S41-1032	**15. الساعات المكتبية ومكانها:**
16. Instructor's Email:	wamer@uob.edu.bh	**16. البريد الإلكتروني لمدرّس المقرر:**
17. Academic Year:	2024-2025	**17. السنة الأكاديمية:**
18. Semester:	Second Semester الفصل الثاني	**18. الفصل الدراسي:**

19. Textbook(s):	**19. الكتب الدراسية للمقرر:**
CHEMISTRY, Steven S. Zumdahl, Susan A. Zumdahl, and Donald J. Decoste, 10th Edition, CENGAGE Learning.	
20. References:	**20. المراجع:**
CHEMISTRY by Jason Overby and Raymond Chang, 14th Edition, McGraw Hill. CHEMISTRY: Principles and Reactions by Masterton Hurley 8th edition.	
21. Other Learning Resources Used (e.g. e-learning, field visits, periodicals, software, etc.):	**21.** مصادر التعلّم الأخرى (مثال: التعلّم الإلكتروني، زيارات ميدانية، دوريات، برمجيات، إلخ....)
22. Course Description (as published in the College Catalogue):	**22. توصيف المقرر (حسب ما ورد في دليل الكلية):**
Atomic structure; formulas and names of chemical molecules; Avogadro's number and the mole; stoichiometry of chemical reactions; acid-base and redox reactions, solutions, concentration units, and colligative properties; gases and gas laws; electronic structure and the electron configuration; periodic properties and chemical bonding: ionic and covalent; Lewis structures and formal charge; molecular geometry and hybridization. Related practical work.	
23. Course Intended Learning Outcomes (3 to 5 CILOs):	**23. مخرجات التعلّم للمقرر (CILOs) (3 إلى 5 مخرجات تعلّمية):**
1. Use the periodic table to predict the types and properties of elements, and their electronic structures	
2. Infer the formulas and the names of chemical molecules and chemical equations for different types of chemical reactions.	
3. Solve basic chemical reaction problems such as moles, mass percent, and molarity.	
4. Explain real-life phenomenon through chemical concepts such as colligative properties of a solution.	
5. Use the ideal gas law and its applications in quantitative problems.	
6. Obtain meaningful conclusions from experimental data.	

24. Course Assessment Percentages (as per Regulations of Study and Examination at the University of Bahrain):		**24. أساليب التقييم ونسبها المئوية (بحسب نظام الدراسة والامتحانات في جامعة البحرين):**	
Assessment **التقييم**	**Type** **النوع**	**Percentage** **النسبة**	**Assessment Date** **تاريخ التقييم**
Midterm I	Individual فردي	12.5 %	Monday, 10 March 2025 11:00 – 12:30 (Hall S18)
Midterm II	Individual فردي	12.5 %	Monday, 21 April 2025 11:00 -12:30 (Hall S18)
3 Quizzes	Individual فردي	10 %	W, 26-Feb-2025 (8-8:30 PM) H, 3-Apr-2025 (8-8:30 PM) W, 23-Apr-2025 (8-8:30 PM)
2 Homeworks	Individual فردي	5 %	U, 23-Mar – H, 27-Mar U, 27-Apr – W, 30-Apr
Laboratory / Practical	Individual فردي	Lab Reports (10%) Lab Exam (10%) Total 20%	Thursday, 8 May 2025 2:00 – 3:30 (Hall S18)
Formative tests	Two formative tests will be conducted before Test 1 and Test 2, and they will not carry any marks.		
Final Examination	Individual فردي	40%	Thursday, 22 May 2025 (11:30 to 1:30)
Total	**100%**		

25. Description of Topics Covered	**25. وصف الموضوعات التي ينبغي تناولها:**
Topic Title ***(e.g. chapter/experiment title)*** **الموضوع**	***Description*** **التفصيل**
Chapter 1 Chemical Foundations	1.3 Units of Measurements *p 8* is expected to be covered independently by all students. 1.5 Significant figures and Calculations *p 14* and Safety rules are introduced during the first lab session.
Chapter 2 Atoms, Molecules, and Ions.	2.5 The Modern View of Atomic Structure: An Introduction *p 46-47* 2.6 Molecules and Ions *p 48-50* 2.7 The Periodic Table *p 51-53* 2.8 Naming Simple Compounds *p 53-63*

Chapter 3 Stoichiometry	3.1 Counting by Weighing *p 69-70* 3.2 Atomic Masses *p 70-72* 3.3 The Mole *p 72-77* 3.4 Molar Mass *p 77-79* 3.6 Percent Composition of Compounds *p 81-83* 3.7 Determining the Formula of a Compound *p 83-90* 3.8 Chemical Equations *p 90-92* 3.9 Balancing Chemical Equations *p 92-95* 3.10 Stoichiometric Calculations: Amounts of Reactants and Products *p 95-100* 3.11 The Concept of Limiting Reactant *p 100-110*
Chapter 4 Types of Chemical Reactions and Solution Stoichiometry	4.1 Water, the Common Solvent *p 117-119* 4.2 The Nature of Aqueous Solutions: Strong and Weak Electrolytes *p 119-123* 4.3 The Composition of Solutions *p 123-130* 4.4 Types of Chemical Reactions *p 130* 4.5 Precipitation Reactions *p 131-136* 4.6 Describing Reactions in Solution *p 136-138* 4.8 Acid-Base Reactions *p 140-147* 4.9 Oxidation-Reduction Reactions *p 147-152*
Chapter 11 Properties of Solutions	11.1 Solution Composition *p 434-437* 11.3 Factors Affecting Solubility *p 441-445* 11.4 The Vapor Pressures of Solutions *p 445-448* 11.5 Boiling-Point Elevation and Freezing-Point Depression *p 451-454* 11.6 Osmotic Pressure *p 454- 458 (only first figure)* 11.7 Colligative Properties of Electrolyte Solutions *p 459-460* 11.8 Colloids *p 461-463*
Chapter 5 Gases	5.1 Pressure *p 165-167* 5.2 The Gas Laws of Boyle, Charles, and Avogadro *p 167-173* 5.3 The Ideal Gas Law *p 173-178* 5.4 Gas Stoichiometry *p 179-183* 5.5 Dalton's Law of Partial Pressures *p 183-189*
Chapter 7 Atomic Structure and Periodicity	7.1 Electromagnetic Radiation *p 252-253* 7.2 The Nature of Matter *p 254 (last paragraph),255 (first example), 258 (last part only)*

	7.3 The Atomic Spectrum of Hydrogen *p 260-261* 7.4 The Bohr Model *p 262-265* 7.5 The Quantum Mechanical Model of the Atom *p 266* 7.6 Quantum numbers *p 269* 7.7 Orbital Shapes and Energies *p 270-272* 7.8 Electron Spin and the Pauli Principle *p 273* 7.9 Polyelectronic Atoms *p 274-275* 7.10 The Aufbau Principle and the Periodic Table *p 278-284* 7.12 Periodic Trends in Atomic Properties *p 284-287, 289-291*
Chapter 8 Bonding: General Concepts	8.1 Tyes of Chemical Bonds *p 301-302, 304-305* 8.2 Electronegativity *p 305-307* 8.3 Bond Polarity and Dipole Moments *p 307-310* 8.4 Ions: Electron Configurations and Sizes *p 310-314* 8.5 Energy Effects in Binary Ionic Compounds *p 314-315* 8.6 Partial Ionic Character of Covalent Bonds *p 318* 8.7 The Covalent Chemical Bond: A Model *p 319* 8.9 The Localized Electron Bonding Model *p 325* 8.10 Lewis Structures *p 325-329* 8.11 Exceptions to the Octet Rule *p 329-332* 8.12 Resonance *p 333-337* 8.13 Molecular Structure *p 337-350*
Chapter 9 Covalent Bonding: Orbitals	9.1 Hybridization and the Localized Electron Model *p 355-362 (till the end of the first figure) p 364-366* 9.2 Paramagnetism *p 372 (first paragraph)*

26. Weekly Schedule | **26. الجدول الأسبوعي**

Week **الأسبوع**	**Date** **التاريخ**	**Topics Covered** **الموضوعات المتناولة**	**CILOs** **مخرجات التعلُم للمقرر (CILOs)**	**Teaching/Assessment Mode and Method** **منهجية ونمط التدريس/التقييم**
1	2/5/2025	General introduction	2	Traditional تقليدي

2	2/9/2025	Chapter (2) 2.5 The Modern View of Atomic Structure: An Introduction 2.6 Molecules and Ions 2.7 The Periodic Table 2.8 Naming Simple Compounds Introduction	1,2	Traditional تقليدي Quiz Test Final Exam
3	2/16/2025	Chapter (3) 3.1 Counting by Weighing 3.2 Atomic Masses 3.3 The Mole 3.4 Molar Mass 3.6 Percent Composition of Compounds 3.7 Determining the Formula of a Compound	2,3	Traditional تقليدي Quiz Tests Final Exam
4	2/23/2025	3.8 Chemical Equations 3.9 Balancing Chemical Equations 3.10 Stoichiometric Calculations: Amounts of Reactants and Products 3.11 The Concept of Limiting Reactant.	3	Traditional تقليدي Quiz Tests Final Exam
5	3/2/2025	**Chapter (4)** 4.1 Water, the Common Solvent	2,3	Traditional تقليدي Quiz Tests Final Exam

		4.2 The Nature of Aqueous Solutions: Strong and Weak Electrolytes 4.3 The Composition of Solutions 4.4 Types of Chemical Reactions		
6	3/9/2025	4.5 Precipitation Reactions 4.6 Describing Reactions in Solution 4.8 Acid-Base Reactions	2,3	Traditional تقليدي Quiz Tests Final Exam
7	3/16/2025	4.9 Oxidation-Reduction Reactions Chapter 11: 11.1 Solution Composition 11.3 Factors Affecting Solubility	3	Traditional تقليدي Quiz Tests Final Exam
8	3/23/2025	11.4 The Vapor Pressures of Solutions 11.5 Boiling-Point Elevation and Freezing-Point Depression 11.6 Osmotic Pressure	3,4	Traditional تقليدي Quiz Tests Final Exam
9	3/30/2025	11.7 Colligative Properties of Electrolyte Solutions 11.8 Colloids	4	Traditional تقليدي Quiz Tests Final Exam
10	4/6/2025	Chapter 5: 5.1 Pressure 5.2 The Gas Laws of Boyle,	5	Traditional تقليدي Quiz Tests Final Exam

		Charles, and Avogadro 5.3 The Ideal Gas Law 5.4 Gas Stoichiometry 5.5 Dalton's Law of Partial Pressures		
11	4/13/2025	Chapter 7: 7.1 Electromagnetic Radiation *p 252-253* 7.2 The Nature of Matter 7.3 The Atomic Spectrum of Hydrogen 7.4 The Bohr Model 7.5 The Quantum Mechanical Model of the Atom 7.6 Quantum numbers	1	Traditional تقليدي Quiz Tests Final Exam
12	4/20/2025	7.7 Orbital Shapes and Energies 7.8 Electron Spin and the Pauli Principle 7.9 Polyelectronic Atoms 7.10 The Periodic Table 8.4 Ions: Electron Configurations and Sizes	1	Traditional تقليدي Quiz Tests Final Exam
13	4/27/2025	7.12 Periodic Trends in Atomic Properties	1	Traditional تقليدي Quiz Tests Final Exam

		Chapter (8): 8.1 Types of Chemical Bonds 8.2 Electronegativity 8.3 Bond Polarity and Dipole Moments 8.4 Ions: Electron Configurations and Sizes		
14	5/4/2025	8.5 Energy Effects in Binary Ionic Compounds 8.6 Partial Ionic Character of Covalent Bonds 8.7 The Covalent Chemical Bond: A Model 8.9 The Localized Electron Bonding Model	1	Traditional تقليدي Quiz Tests Final Exam
15	5/11/2025	8.10 Lewis Structures 8.11 Exceptions to the Octet Rule 8.12 Resonance 8.13 Molecular Structure (9) 9.1 Hybridization and the Localized Electron Model 9.2 Paramagnetism	4	Traditional تقليدي Quiz Tests Final Exam
27. Academic Integrity Statement			**27. بيان النزاهة الأكاديمية**	

Students are to observe the highest level of honesty and academic ethics in pursuit of their academic goals as per UOB Regulations of Student Conduct and Academic Integrity, Anti-plagiarism Policies, and Students' Rights and Responsibilities Handbook. The consequences for cheating, plagiarism, unauthorized collaboration, and other forms of academic dishonesty can be very serious and will be dealt with as per the aforementioned policies and regulations.	يتعيّن على الطلبة الالتزام بأعلى مستويات الصدق والأمانة والأخلاق الأكاديمية في سعيهم لتحقيق أهدافهم الأكاديمية وفقًا للوائح سلوك الطلاب والنزاهة الأكاديمية، سياسات مكافحة الانتحال، ودليل حقوق الطلبة وواجباتهم، المعمول بها في جامعة البحرين. يمكن لعواقب الغش والسرقة الأدبية والتعاون غير المصرح به وغيرها من أشكال عدم الأمانة الأكاديمية أن تكون خطيرة للغاية وسيتم التعامل معها وفقًا للسياسات واللوائح المذكورة آنفا.
28. Attendance and Absence Regulations	**28. نظام الحضور والغياب**
Students are required to adhere to regular attendance for class lectures and practical sessions, as determined by the nature of the course, as per Article (33) of Regulations of Study and Examination at the University of Bahrain.	يجب على الطلبة الالتزام بالحضور المنتظم للمحاضرات الصفية والعملية، حسبما تحدده طبيعة المقرر الدراسي، ووفقا للمادة (33) من نظام الدراسة والامتحانات في جامعة البحرين.

القسم الخاص بمدرّس المقرر والقسم الأكاديمي
Section Concerning the Course Instructor and Academic Department

29. Program Intended Learning Outcomes (7-10 PILOs):	**29. المخرجات التعلّمية للبرنامج (7-10 PILOs):**
1. Acquire a broad set of knowledge concerning the fundamentals in the disciplinary and interdisciplinary areas of chemistry.	
2. Use standard laboratory equipment, modern instrumentation, and techniques to build up and enhance practical skills.	
3. Acquire, analyze, and interpret experimental data and reach valid scientific conclusions.	
4. Acquire the basic skills of scientific research.	
5. Employ electronic data basis and search tools to retrieve scientific information.	
6. Communicate the concepts and results of the theoretical and experimental work through effective writing and oral communication skills.	
7. Act with integrity and good ethics.	
8. Demonstrate understanding of proper and safe handling of chemicals and environmental issues.	
9. Acquire a broad set of scientific and general knowledge.	
10. Acquire self-learning to ensure lifelong learning.	

30. NQF Level Descriptors:		**30. المحددات الوصفية لمستويات الإطار الوطني للمؤهلات:**	
K1	**Knowledge:** Theoretical Understanding	**المعرفة:** الفهم النظري	**K1**
K2	**Knowledge:** Applied Knowledge	**المعرفة:** المعرفة التطبيقية	**K2**

S1	**Skills:** Generic Problem Solving & Analytical skills	**المهارات:** مهارات حلّ المشكلات العامة والمهارات التحليلية	**S1**
S2	**Skills:** Communication, ICT, and Numeracy	**المهارات:** مهارات الاتصال، ومهارات تقنية المعلومات والاتصالات، والمهارات العددية	**S2**
C	**Competence:** Autonomy, Responsibility & Context	**الكفاية:** الاستقلالية والمسؤولية والسياق	**C**

31. Mapping of Course Intended Learning Outcomes (CILOs): | **31. ربط المخرجات التعلُمية للمقرر (CILOs):**

CILO Number (from table 23)	Mapping to PILOs	Mapping to NQF Level Descriptors	NQF Level	Mapping to Criteria According to Accreditation Body (when different from PILOs)
رقم المخرج التعلّمي (الجدول 23)	الارتباط بالمخرجات التعلُمية للبرنامج (PILOs)	الارتباط بالمحددات الوصفية لمستويات الإطار الوطني للمؤهلات	مستوى الإطار	الارتباط بمعايير هيئة الاعتماد الدولي (عند اختلاف المعايير عن المخرجات التعلُمية للبرنامج)
1	1	K1, S1	5	
2	1	K1, S1	5	
3	1	K1, K2, S1	5	
4	1	K1, K2, S1	5	
5	2,3,4,5,6,7,8	K2,S1,S2,C	5	

32. Mapping of Course Assessment: | **32. ربط أساليب التقييم:**

Assessment التقييم	Formative / Summative تكويني / ختامي	Mapped CILO الربط بمخرجات التعلّم للمقرر	Assessment NQF Level Descriptor (Refer to table 30) وصف التقييم بناء على المحددات الوصفية لمستويات الإطار الوطني للمؤهلات (جدول 30)	NQF Level مستوى الإطار
Midterm I	ختامي Summative	2,3	K1, S1	5
Midterm II	ختامي Summative	3,4	K1, S1	5
Quizzez	ختامي Summative	1,2,3,4	K1, S1	5
Homework	ختامي Summative	1,2,3,4	K1, S1, C	5
Quizzes	Formative	1,2,3,4	K1, S1	5
Laboratory reports	ختامي Summative	5	K1, K2, S1, S2, C	5
Laboratory Test	ختامي Summative	2,3,4,5	K1, K2, S1	5
Final	ختامي Summative	1,2,3,4	K1, K2, S1	5

33. Allocation of NQF Credit | **33. تحديد الساعات المعتمدة في الإطار الوطني للمؤهلات**

Learning Activity النشاط التعليمي	Activity Duration مدة النشاط	Frequency التكرار	Notional Hours الساعات الافتراضية
Lessons / Lectures / Seminars	Lecture: 3 hours per week	3/week * number of weeks (15) = 45	45
Tutorial	NA	NA	0
Practical / Laboratory	Laboratory: 3 hours per week	3/weeks * number of experiments (8) = 24	24
Supervised Assessment **التقييم الموجّه**	/ Final exam * 2 hrs 3 Quizzes * 0.5 hr 2 Homework * 0.5 hr	1 final exam * 2 hours = 2 3 Quizzes * 0.5 hr = 2 2 Homework * 0.5 hr = 1	5
Student Centered Learning / Independent Learning **التعلم المتمركز حول الطالب/ التعلّم المستقل**	Notes reading – 2 hrs per week * 15 weeks Quiz 1 – 2 hour Quiz 2 – 2 hour Quiz 3 – 2 hour Formative test 1 – 1 hour Formative test 2 – 1 hour Test 1 – 5 hours Test 2 – 5 hours Lab test – 4 hours Final test – 15 hours Lab reports 2 hrs	2 * 15 = 30 2 * 1 = 2 2 * 1 = 2 2 * 1 = 2 1 * 1 = 1 1*1=1 5 * 1 = 5 5 * 1 = 5 4 * 1 = 4 15 * 1 = 15 2 x 4 =8	75
Work based Learning **التعلّم القائم على عمل**	NA	NA	0
Other *(specify)* ***أخرى (يرجى ذكرها)***	NA	NA	0
Total Notional Hours: **مجموع الساعات الافتراضية**			149
NQF Credit *(divide notional hours by 10)* ***الساعات المعتمدة في الإطار الوطني للمؤهلات (اقسم مجموع الساعات الافتراضية على 10)***			15
Notes if any:			**ملحوظات إن وجدت:**

For more information about the allocation process, kindly refer to:		
NQF Handbook NQF General Policies NQF Capacity Building Course Assigning Credit Hours to Courses		
للمزيد من المعلومات حول تحديد الساعات يرجى الرجوع إلى:		
دليل الإطار الوطني للمؤهلات السياسات العامة للإطار الوطني للمؤهلات دورة بناء القدرات للإطار الوطني للمؤهلات سياسة تحديد الساعات المعتمدة للمقررات الدراسية		
Prepared by:	**Dr. Wael Amer**	**أُعدّتْ من قبل:**
Date:	**9-Feb-2025**	**تاريخ الإعداد:**
Updated by:		**حُدِّثتْ من قبل:**
Reviewed by:		**روجعت من قبل:**
Approved by Department Council on: [Click or tap to enter a date.], **Meeting no.** [ ] **for the academic year** [ ]		**أعتمدتْ الاستمارة من قبل مجلس القسم بتاريخ:** [Click or tap to enter a date.]، **رقم الاجتماع** [ ] **للسنة الأكاديمية** [ ]