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:	CHEMY332	**1. رمز المقرر:**
2. Course Title	Practical Physical Chemistry	**2. اسم المقرر:**
3. College:	Science	**3. الكلية:**
4. Department:	Chemistry	**4. القسم:**
5. Academic Program:	Bachelor of Science in Chemistry	**5. البرنامج الأكاديمي:**
6. Course Credits:	0-6-3	**6. عدد الساعات المعتمدة:**
7. Course NQF Level:	7	**7. مستوى المقرر وفقا للإطار الوطني للمؤهلات:**
8. Notional Hours:	140	**8. عدد الساعات الافتراضية:**
9. NQF Credits:	14	**9. عدد الساعات المعتمدة للمقرر وفقا للإطار الوطني للمؤهلات:**
10. Prerequisite:	CHEMY331	**10. المتطلب السابق للمقرر:**
11. Lectures Timing & Location:		**11. وقت المحاضرة ومكانها:**
12. General Mode of Teaching and Learning	Tranditional تقليدي	**12. النمط العام للتعليم والتعلّم:**

13. Course Coordinator:		**13. منسّق المقرر:**
14. Course Instructor:		**14. مدرّس المقرر:**
15. Office Hours and Location:		**15. الساعات المكتبية ومكانها:**
16. Instructor's Email:		**16. البريد الإلكتروني لمدرّس المقرر:**
17. Academic Year:		**17. السنة الأكاديمية:**
18. Semester:		**18. الفصل الدراسي:**

19. Textbook(s):	**19. الكتب الدراسية للمقرر:**
Laboratory Manual prepared in the department: Source: Journal of Chemical Education.	
20. References:	**20. المراجع:**
Experiments in Physical Chemistry by Shoemaker, Garland and Nibler; McGraw-Hill.2012 Textbook BY P. Atkins, 10th 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):**
Techniques in physical chemistry and quantitative studies illustrated through experiments on dipole moment, solubility product constant and mean ionic activity coefficient, conductance of electrolytes, transport phenomena, heat of solution with calorimetry, reaction kinetics, surface chemistry and surface tension, activation energy, homogenous and heterogenous catalysis, and equilibrium constant by distribution.	
23. Course Intended Learning Outcomes (3 to 5 CILOs):	**23. مخرجات التعلّم للمقرر (CILOs) (3 إلى 5 مخرجات تعلّمية):**
1. Use advanced skills to apply techniques in physical measurement and quantitative studies.	
2. Critically analyze various solutions	
3. Interpret experimental data using software such as Excel for data analysis.	
4. Write Scientific lab report for experiments individually.	
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	15%	
Midterm II	Individual فردي	15%	
Practical test	Individual فردي	10%	
Laboratory reports	Individual فردي	20%	
Final Exam	Individual فردي	40%	
Total	**100%**		

25. Description of Topics Covered	**25. وصف الموضوعات التي ينبغي تناولها:**
Topic Title ***(e.g. chapter/experiment title)*** **الموضوع**	***Description*** **التفصيل**
Theoretical background for each experiment (on weekly basis)	Explanation of each experiment: first explanation, then video recording, Data analysis and calculations.
Lab report writing	How to organize lab report, including graphs, tables and statistical calculations.
Exp. 1: The Acid-catalyzed Iodination of Acetone	Specific and General Catalysis.
Exp. 2: Measurement of Dipole Moments of Polar Molecules in solution.	Measurements of dipole moments of polar molecules in solution after measuring the dipole moments and the refractive indices.
Exp. 3: Kinetics of Decomposition of Hydrogen peroxide	Measurement of Oxygen gas at various time intervals, in presence of Homogenous and heterogenous catalysts. Calculation of activation energies in presence of both catalysts.
Exp. 4: Solubility Product	The solubility of Potassium periodate and its dependence on solution composition.
Exp. 5: Conductance of electrolytes in aqueous solutions	Measurements of conductance of strong electrolytes and study the extent of dissociation of weak electrolyte with concentrations.
Exp. 6: Measurement of transport number	Using moving boundary method (Bromothymol Blue in Hydrochloric acid (dil)) to calculate transport number, and molar conductivity.
Exp. 7: Heat of Solution	Measure the heat of solution of Potassium nitrate in hydrochloric acid using Solution Calorimeter.
Exp. 8: Chemical Kinetics	Kinetics of reaction between Ethyl Acetate and Sodium Hydroxide using Conductivity method at various temperatures.
Exp. 9: Gibbs Adsorption Isotherm	To study the change in surface tension as concentration for aqueous solution of n-Butanol and Sodium Chloride, Gibbs isotherm, and surface concentration.

Exp. 10: Adsorption of Acetic acid on Charcoal	Extent of Adsorption, Ideal and non-ideal adsorption isotherm.
Exp. 11: Solution kinetics followed by optical rotation	To study the kinetics of mutarotation of glucose by using specific rotation of D (+) Glucose solution

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		Laboratory (1) Laboratory Safety and introduction for the first set of experiments	1,2	Tranditional تقليدي
2		Exp. 1: The Acid-catalyzed Iodination of Acetone	1-4	Tranditional تقليدي
3		Exp. 2: Measurement of Dipole Moments of Polar Molecules in solution.	1-4	Tranditional تقليدي
4		Exp. 3: Kinetics of Decomposition of Hydrogen peroxide	1-4	Tranditional تقليدي
5		Exp. 4: Solubility Product	1-4	Tranditional تقليدي
6		Exp. 5: Conductance of electrolytes in aqueous solutions	1-4	Tranditional تقليدي
7		Exp. 6: Measurement of transport number	1-4	Tranditional تقليدي
8		Submission of Lab reports (1-6)	4	Choose an item.
9		Introduction and theory for the second set of experiments	4	Tranditional تقليدي
10		Exp. 7: Heat of Solution	1-4	Tranditional تقليدي
11		Exp. 8: Chemical Kinetics	1-4	Tranditional تقليدي
12		Exp. 9: Gibbs Adsorption Isotherm	1-4	Tranditional تقليدي
13		Exp. 10: Adsorption of Acetic acid on Charcoal	1-4	Tranditional تقليدي
14		Exp. 11: Solution kinetics followed by optical rotation	1-4	Tranditional تقليدي
15		Exp 12	1-4	**Tranditional تقليدي**
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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.