**جامعة : المنصورة**

**كـــلية : العلوم**

**قسم / الكيمياء**

**توصيف مقرر دراسى**

| ١ -بيانات المقرر | | |
|---|---|---|
| ***الرمز الكود :*** ك١٤١ | ***أسم المقرر:*** Principles of physical chemistry | ***المستوى : الاول*** |
| ***البرنامج : الكيمياء*** | ***عدد الوحدات الدراسية:٣ نظرى : ٢ تمارين: ١ عملى:٢*** | |

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| **٢- هدف المقرر:** | **For students undertaking this course, the aims are to:**<br>1-Introduce some basic concepts of physical chemistry.<br>2-Introduce the fundamental information about the gaseous state of matters and its laws.<br>3 - Study the first law of thermodynamics and its applications.<br>4 - Learn the essential conceptions of thermochemistry and thermochemical equations.<br>5 - Study the principles of chemical equilibrium.<br>6 - Introduce the main information about the electrical conductance and the phenomena of electrolysis**.**<br>7 - Enable the students to have an idea about both the colloidal and the solid states of matter. |
| **٣- المستهدف من التدريس المقرر:** | |
| **أ-المعلومات والمفاهيم:** | **a- Knowledge and Understanding :**<br>**On completing this course, students will be able to:**<br>a 1- know the basic concepts of physical chemistry.<br>a 2- recognize the main theories and laws of thermochemistry, thermodynamics, gases and chemical equilibrium.<br>a 3- know the electrical conductance and its applications. |
| **ب- المهارات الذهنية** | **b- Intellectual Skills: On completing this course, students will be able to:** |

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| b 1- apply the gases and thermodynamics laws.<br><br>b 2- distinguish different types of thermochemical reactions.<br><br>b 3- apply Le-Chatelier principle. | |
| **c-Professional and Practical Skills: On completing this course, students will be able to:**<br><br>c 1- differentiate between the radical, basic or acidic.<br><br>c 2 - analyze a mixture to its components.<br><br>c 3 - identify simple inorganic liquids**.** | **ج- المهارات المهنية الخاصة بالمقرر:** |
| **d-General and Transferable Skills: On completing this course, students will be able to:**<br><br>d 1 - work effectively on solving physical chemistry problems.<br><br>d 2 - use IT and search for information.<br><br>d 3- communicate effectively with their lecturers and colleagues. | **د- المهارات العامة :** |
| 1- Gaseous state: General ideal gas equation - Kinetic theory of gases - Applicability of the ideal gas laws - Liquefaction of gases.<br>2- Thermodynamics: First law of thermodynamics- Application of the first law -Thermochemistry- Thermochemical equations - Hess's law of heat summation.<br>3- Chemical equilibrium: Law of mass action- equilibrium constants - Le Chatelier principle - Equilibrium in homogeneous and heterogeneous gas and liquid systems.<br>4- Electrical conductance: The phenomena of electrolysis - Determination of conductance - Application- Electromotive force and Electrode potential.<br><br>5- Electrical conductance: Chemical and electrical energy- Cell reaction and E.M.F. - Electrode potential - Electrochemical series.<br>6- Colloidal state: General properties - Preparation and purification.<br>7- Solid-state: Crystallographic systems- Isomorphism- Polymorphism - Application of X- rays.<br>8- Practical: Qualitative inorganic analysis: Identification of acidic and basic radicals -Identification of simple inorganic liquids. | **٤- محتوى المقرر:** |
| 1 - Lectures using data show and board<br><br>2 - Home works, reports and discussion groups | **٩- اساليب التعليم والتعلم:** |

3 - Lab work.

**١٠- أساليب التعليم والتعلم للطلاب ذوى القدرات المحدودة :**

**The same as normal students, only skeletal disabilities are allowed in the Faculty of Science.**

**١١- تقويم الطلاب :**

**أ- الأساليب المستخدمة :**

***7- Student Assessment Methods***

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| **Practical exam** | **To assess** | c1-c3 |
| **Final exam** | **to assess** | a1-a3, b1-b3 |
| **Oral exam** | **to assess** | a1-a3, b1-b3 |
| **Mid-term exam** | **To assess** | a1-a3, b1-b3 |
| **Report** | **to assess** | d1-d3 |

**ب- التوقيت :**

**Assessment Schedule**

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| **Assessment 1** | **Week #final exam** | **Week 14** |
| **Assessment 2** | **Week #oral exam** | **Week 14** |
| **Assessment 3** | **Week #practical exam** | **Week 12** |
| **Assessment 4** | **Week #mid-term exam** | **Week 7** |
| **Assessment 5** | **Week #report** | **Week 10** |

**ج- توزيع الدرجات :**

*Weighting of Assessments*

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| **Final-Term Examination** | **60%** |

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| **Oral Examination** | **10%** | | |
| **Practical Examination** | **20%** | | |
| **Semester work** | **0%** | | |
| **Mid-term examination** | **10%** | | |
| **Other types of assessment** | **0%** | | |
| **Total** | **100%** | | |

**٨- قائمة الكتب الدراسية والمراجع :**

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|---|---|
| **أ- مذكرات:** | 1 - Physical chemistry |
| **ب- كتب ملزمة** | |
| **ج- كتب مقترحة :** | 1 - Physical chemistry, Peter Atkins, Julio de Paula, Oxford University Press, New York, Oxford, 2006.<br><br>2 - Physical chemistry, Thomas Engel, Philip Reid, Publisher: Pearson Benjamin Cummings, San Francisco, 2006.<br><br>3 - Elements of physical chemistry, Atkins, P. W., Publisher: W.H. Freeman, Oxford University Press, New York, 2005. |
| **د- دوريات علمية أو نشرات..** | |

## مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

| المحتويات للمقرر | أسبوع الدراسة | المعارف الرئيسية | مهارات ذهنية | مهارات مهنية | مهارات عامة |
|---|---|---|---|---|---|
| 1- Gaseous state , General ideal gas equation | **1** | a1, a2 | b1 | | d2 |
| 2- Kinetic theory of gases | **2** | a1, a2 | b1 | | |

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| 3- Applicability of the ideal gas laws | **2** | a1, a2 | b1 | | d3 |
| 4- Liquefaction of gases | **2** | a1, a2 | b1 | | |
| 5- Thermodynamics: First law of thermodynamics- Application of the first law | **3** | a1, a2 | b1 | | d2,d3 |
| 6- Thermochemistry- Thermochemical equations - Hess's law of heat summation | **4** | a1, a2 | b1, b2 | | |
| 7- Chemical equilibrium: Law of mass action- equilibrium constants | **5** | a1, a2 | b3 | | d1 |
| 8- Le Chatelier principle | **5-6** | a1, a2 | b3 | | |
| 9- Equilibrium in homogeneous and heterogeneous gas and liquid systems | **6** | a1, a2 | | | |
| 10- Electrical conductance: The phenomena of electrolysis | **7** | a1, a3 | | | |
| 11- Determination of conductance | **7** | a1, a3 | | | |
| 12- Application- Electromotive force and Electrode potential. Chemical and electrical energy- Cell reaction and E.M.F. | **8** | a1, a3 | | | |
| 13- Electrode potential - Electrochemical series. Colloidal state: General properties- Preparation and purification. | **9-10** | a1, a3 | | | |
| 14- Solid-state, Crystallographic systems- Isomorphism- Polymorphism. Application of X- rays | **11-12** | a1 | | | |
| 15- Practical: Qualitative inorganic analysis: Identification of acidic and basic radicals -Identification of simple inorganic liquids. | **11-12** | | | c1, c2 | d1 |

**أستاذ المادة : ا.د/ عبدالمنعم الحسينى العسقلانى**

**رئيس مجلس القسم العلمي : أ.د /سالم السيد سمرة**