



توصيف مساق.....Chem 403342.....

1. معلومات مدرس المساق (Instructor)

|                       |   |
|-----------------------|---|
| Raid Banat            | اسم ( مدرس / منسق ) المساق :                |
| 12.00-13.00 Sun-Wed   | الساعات المكتتبة :                          |
| 2132                  | رقم المكتب والرقم الفرعي :                  |
| raidbanat@aabu.edu.jo | البريد الالكتروني :                         |
| NA                    | مساعد البحث والتدريس/المشرف/الفني (إن وجد): |

2. وصف المساق (Course Description)

This course provides a basic practical understanding of the core area of physical chemistry, based around the theme of kinetics and electrochemistry. Topics covered are chemical kinetics, reaction rate, order, rate constant, factors affecting rate, electrochemistry, thermodynamic of oxidation reduction reactions, spectrophotometric analysis for chemical reaction.

A good understanding of practical physical chemistry is important to students intending to complete a major or minor study in chemistry.

3. بيانات المساق (Course Title)

|                           |  |                            |
|---------------------------|--|----------------------------|
| المستوى: Level 3          | اسم المساق: Practical Physical Chemistry II  | رقم المساق: 403342         |
| وقت المحاضرة: 16.00-13.00 | المتطلب السابق / المتزامن: Physical Chem. II | طبيعة المساق: نظري/عملي    |
| عدد الساعات الدراسية: 1   | الفصل الدراسي: Summer                        | العام الجامعي: 2018 / 2019 |

4. أهداف المساق (Course Objectives)

|  |    |
|--|----|
| To provide the student with practical experience in the techniques of experimental physical chemistry  | أ- |
| To study kinetic rate of chemical reaction and factors affecting the rate and deepen the student's understanding of the principles of chemical kinetics, | ب- |
| To study spectrophotometry and determine equilibrium constant  | ج- |
| To study electrochemical reactions and determine thermodynamics functions experimentally   | د- |

To study reaction kinetics by following conductivity measurement

هـ -

**5. مخرجات التعلم (Intended Student Learning Outcomes)**  
(المعرفة والمهارات والكفايات)

يفترض بالطالب بعد دراسته لهذا المساق أن يكون قادرا على:

After completing the course, the student will be able to:

1. Master basic principles in experimental chemical kinetics.
2. Master basic principles in experimental electrochemistry.
3. Master basic principles in experimental spectroscopy for  $K_a$  determination

**4. محتوى المساق (Course Content)**

| الموضوع   | الأسبوع |
|---|---------|
| Theoretical lectures on first experimental rotation (exp. 1-exp. 6)   | الأول   |
| Experiment No.1<br>Determination of the order of a chemical reaction  | الاول   |
| Experiment No.2<br>Kinetic study of the first order reactions by titration method   | الثاني  |
| Experiment No.3<br>Bronsted primary salt effect: effect of ionic strength on rate constant of reaction of malachite green with hydroxyl ion | الثاني  |
| Experiment No.4<br>The effect of concentration and temperature on rate of the reaction  | الثالث  |
| Experiment No.5<br>Determination of solubility of slightly soluble salts by electrical conductivity   | الثالث  |
| Experiment No.6<br>Kinetic study of the reaction of sodium peroxodisulfate and iodine ( the iodine clock reaction)                          | الرابع  |
| Theoretical lectures second experimental rotation (exp. 6-exp. 11)  | الرابع  |

|  |               |
|--|---------------|
| Experiment No.7-8<br>Spectrophotometric determination of pKa of and acid-base indicator              | الخامس        |
| Experiment No.9-10<br>Reaction of ethyl acetate with hydroxyl ion followed by electrical conductance | السادس        |
| Experiment No.11<br>The thermodynamics od the Daniel cell  | السابع        |
|  |               |
| <b>Final Exam (week 8; All material covered)</b>   | <b>الثامن</b> |

**9. استراتيجيات التعليم والتعلم وطرق التقويم**  
**(Teaching and learning Strategies and Evaluation Methods)**

| ت | مخرجات التعلم  | استراتيجيات التدريس  | أنشطة التعلم   | نوع التقويم/القياس<br>(امتحان/عروض صفية/مناقشة/واجبات) |
|---|--|--|--|--|
| 1 | Master basic principles in experimental chemical kinetics. | - Home works<br>- pre lab evaluation<br>- Post lab evaluation<br>- practicing experimentally | - writing and submitting experimental reports<br>- report calculation<br>-homework<br>- problems | Reports + exam   |
| 2 | Master basic principles in experimental electrochemistry.  | - Home works<br>- pre lab evaluation<br>- Post lab evaluation<br>- practicing experimentally | - writing and submitting experimental reports<br>- report calculation<br>-homework<br>- problems | Reports + exam   |
| 3 | Master basic principles in experimental spectroscopy for   | - Home works<br>- pre lab evaluation<br>-Post lab evaluation                                 | - writing and submitting experimental reports  | Reports + exam   |

|  |   |                             |                  |  |
|--|---|-----------------------------|------------------|--|
|  | - report calculation<br>-homework<br>- problems | - practicing experimentally | Ka determination |  |
|--|---|-----------------------------|------------------|--|

### 1. تقييم الطلبة (Assessment)

| توزيع الدرجات لكل أسلوب | توقيت التقييم                       | الأساليب المستخدمة                  |
|-------------------------|-------------------------------------|-------------------------------------|
| 30%                     | خلال الفصل                          | 1-أعمال الفصل: (تقرير، وظائف، حضور) |
| 20%                     | خلال الفصل                          | 2-امتحان تحرير (قصير + شفوي)        |
| 50%                     | أسبوع الامتحانات النهائية للمختبرات | 3-امتحان تحريري نهائي               |

### 2. الكتاب المقرر (Text Book)

|                               |                          |
|-------------------------------|--------------------------|
| Physical Chemistry lab manual | المرجع الرئيس            |
| Department stuff              | المؤلف                   |
| Chemistry dept. Notes         | الناشر                   |
| 2010                          | السنة                    |
| 1 <sup>st</sup> edition       | الطبعة                   |
|                               | الموقع الالكتروني للمرجع |

### 3. المراجع الإضافية (References) (وتشمل الكتب والبحوث المنشورة في الدوريات او المواقع الالكترونية)

|   |    |
|---|----|
| Peter Atkins and Jolio de Paula, Atkins Physical chemistry, 7 th Ed, Oxford university press, 2002            | -1 |
| -Keith J. Laidler and John H. Meiser, "Physical Chemistry, 4 rd Ed.", Houghton Mifflin Company, Boston, 2003. | -2 |