جامعة : المنصورة

كـــلية : العلوم

قسم / الكيمياء

توصيف مقرر دراسى

١ -بيانات المقرر		
الرمز الكود : ك٢٤١	*أسم المقرر*:thermodynamic	*المستوى : الثانى*
البرنامج : الكيمياء	*عدد الوحدات الدراسية:٣* *نظرى : ٢* *تمارين: -* *عملى: ٣*	

٢- هدف المقرر:	**For students undertaking this course, the aims are to:** • Introduce the basic concepts of thermodynamics. • Introduce an idea about the maximum work and the chemical affinity. • Study the second law of thermodynamics and its applications. • Study the third law of thermodynamics and the thermodynamic properties of solutions. Acquire the students the volumetric titration skills and the group work skills.
٣- المستهدف من التدريس المقرر:	
أ-المعلومات والمفاهيم:	**a- Knowledge and Understanding :** **On completing this course, students will be able to:** a1- define the basic concepts of physical chemistry . a2- state the significance of thermodynamic functions.
ب- المهارات الذهنية	**b- Intellectual Skills: On completing this course, students will be able to:** b1- apply the thermodynamics laws. b2- predict and calculate the thermodynamic properties of a solution.
ج- المهارات المهنية الخاصة بالمقرر:	**c-Professional and Practical Skills: On completing this course, students will be able to:** c1- determine the concentration of a solution using the complexometric titration reactions. c2- find out the concentration of a solution via precipitation of the titrand in an appropriate form by titration.

c3- handle accurately the titration experiments and deal carefully with their tools.

د- المهارات العامة :

d-General and Transferable Skills: On completing this course, students will be able to:

d1- solve problems on scientific basis.

d2- work independently and in group effectively.

٤- محتوى المقرر:

- The second law of thermodynamics- Carnot cycle – Entropy
- First and Second laws combined- Entropy changes in different systems
- Application of thermodynamics to changes of state
- Maximum work and chemical affinity- General criterion of equilibrium relations among the thermodynamic properties and functions
- Gibbs-Helmholtz equation- Free energy of ideal gases- Fugacity and activity concepts
- Thermodynamic properties of solutions- The third law of thermodynamics
- Approach to absolute zero- Free energies of gaseous reactions from the third law -Entropy of gases

٥- اساليب التعليم والتعلم:

1 - Lectures using data show and board

2 - Home works, reports and discussion groups

3 - Lab work.

4- Problem classes and group tutorial

٦- أساليب التعليم والتعلم للطلاب ذوى القدرات المحدودة :

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

٧- تقويم الطلاب :

أ- الأساليب المستخدمة :

7- Student Assessment Methods

Practical exam	**To assess**	d2
Final exam	**to assess**	a1-a2, b1-b2, d1
Oral exam	**to assess**	a1-a2, b1-b2

Mid-term exam	**To assess**	a1-a2, b1-b2		

ب- التوقيت :

Assessment Schedule

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 4,8,12**

ج- توزيع الدرجات :

Weighting of Assessments

Final-Term Examination	**60%**
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 :

أ- مذكرات:

1-Thermodynamics

ب- كتب ملزمة

ج- كتب مقترحة :

Physical chemistry, Peter Atkins, Julio de Paula, Oxford University Press, New York, Oxford, 2006.

Physical chemistry, Thomas Engel, Philip Reid, Publisher: Pearson Benjamin Cummings, San Francisco, 2006.

Elements of physical chemistry, Atkins, P. W., Publisher: W.H. Freeman, Oxford

University Press, New York, 2005. Systems, States, and Processes	
http://eppe.tripod.com/index.htm	د- دوريات علمية أو نشرات..

مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	اسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
• The second law of thermodynamics- Carnot cycle - Entropy	1-2	a1,a2	b1,b2		d1
• First and Second laws combined- Entropy changes in different systems	3-4	a1,a2	b1,b2		d1
• Application of thermodynamics to changes of state	5-6	a1,a2	b1,b2		d1
• Maximum work and chemical affinity- General criterion of equilibrium relations among the thermodynamic properties and functions	7	a1,a2	b1,b2		d1
• Gibbs-Helmholtz equation- Free energy of ideal gases- Fugacity and activity concepts	8-9	a1,a2	b1,b2		d1
• Thermodynamic properties of solutions- The third law of thermodynamics	10	a1,a2	b1,b2		d1
• Approach to absolute zero- Free energies of gaseous reactions from the third law -Entropy of gases	11-13	a1,a2	b1,b2		d1

أستاذ المادة : أ.د./عوض ابراهيم أحمد محمد

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