An-Najah N. University Summer Course 2012
Department of Chemistry
Advanced Inorganic Chemistry

Instructor: Hikmat Hilal

Elective course, 3 credits, 3 Lectures/week
Recommended pre-requisite: Chem. 23322 or equivalent

Objectives: The main objective of this course is to introduce the student to advanced areas of contemporary inorganic chemistry.

Course description: The course starts with an intermediate level treatment of organometallic compounds as a special class of non-classical coordination compounds. The course then gives an in depth study for contemporary applications of inorganic compounds in modern technology.

Course Outline:

1) Introduction, theories of bonding and structure	(10 Lectures)
2) Organometallic Chemistry (Principles)	(10 Lectures)
3) Organometallic Chemistry (Applications)	(3 Lectures)
4) Inorganic Compounds in action	(19 Lectures)
- Ionic conducting materials	
- Liquid Ionic materials	
- p-n junctions and photovoltaics	
- Metal oxide electrode technology,	
- Lithium Ion Insertion batteries, capacitors	
- LC and LCD	
1^{st} hour test	(1 lecture)
2^{nd} hour test	(1 lecture)
Student activities	(2 lectures)
Final Exam	(2 lectures)
Total	(48 lectures)

Evaluation:

1^{st} hour Test	20%
2^{nd} hour Test	20%
Independent activity	10%
Final Exam	50%

ILOs:
After completing this course, the student will be able to;

1) Use basic theories of bonding to explain structure and chemical properties of organometallic compounds
2) Explain a number of physical properties (crystal structure, melting point, conductivity) of inorganic compounds
3) Explain how advanced inorganic materials are used in modern technology applications (such as photo-voltaics, ion insertion electrode technology, and liquid crystal technology).
4) Use online literature to independently study modern applications of inorganic materials.

References:

1) G. L. Miessler and D. A. Tarr, Inorganic Chemistry, 4th Ed., Pearson, Boston, 2011.R. West, Solid State Chemistry, J. Wiley.
2) Hikmat S. Hilal, Homogeneous Catalysis with Organometallic Complexes.
3) Introduction to Materials Science
4) L. Smart & E. Moore, Solid State Chemistry, an Introduction, Chapman and Hall.
5) J. C. Anderson & K. D. Leaver, Materials Science, Nelson.
6) Online journals
7) Internet search.

Updated by: H. S. Hilal June 2012