

ATTACHMENT 5.

Kingdom of Saudi Arabia
**The National Commission for Academic Accreditation &
Assessment**

T6. Course Specifications
(CS)

Solid State Chemistry

(402622-3)



Course Specifications

Institution: Umm Al-qura University	Date: 2017
College/Department: Faculty of Applied Sciences / Department of Chemistry	

A. Course Identification and General Information

1. Course title and code: Solid State Chemistry / 402622-3	
2. Credit hours: 3 (theoretical)	
3. Program(s) in which the course is offered.: M. Sc. in Chemistry (If general elective available in many programs indicate this rather than list programs)	
4. Name of faculty member responsible for the course: Prof. Dr. Nashwa El-Metwaly	
5. Level/year at which this course is offered : 2nd / 1st	
6. Pre-requisites for this course (if any): not applicable	
7. Co-requisites for this course (if any): not applicable	
8. Location if not on main campus: El-Abedyah, El-Azizya, and El-Zaher	
9. Mode of Instruction (mark all that apply)	
a. traditional classroom	<input type="checkbox"/> What percentage? <input type="checkbox"/>
b. blended (traditional and online)	<input checked="" type="checkbox"/> What percentage? <input type="text" value="70%"/>
c. e-learning	<input checked="" type="checkbox"/> What percentage? <input type="text" value="30%"/>
d. correspondence	<input type="checkbox"/> What percentage? <input type="checkbox"/>
f. other	<input type="checkbox"/> What percentage? <input type="checkbox"/>
Comments:	

B Objectives

1. What is the main purpose for this course?

This course aims to knowing the following: fundamentals regarding the solid state, including selected structural examples. Theoretical and practical crystallography. Unary and binary phase diagrams. X-ray diffraction, thermal analysis and introduction to other characterization techniques.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- The use of smart teaching halls for lectures.
- Increased use of IT or web based reference material.
- Encourage students to carry out research reports in different subjects of the course using the library, data base services, and/or websites.
- Changes in content as a result of new research in the field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

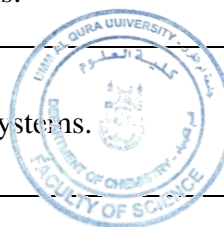
Course Description:

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
The principles concerning solid state structures.	2	6
Describing specific crystal structures by applying basic crystallographic concepts.	2	6
The generation of X-ray radiation and its effects on matter	2	6



The experimental use of the diffraction phenomenon	2	6
Using powder diffraction data for characterizing cubic substances.	1	3
Relating diffraction intensities mathematically to structural parameters and derive extinction conditions	2	6
Using crystallographic data for a validated phase analysis.	1	3
Analyzing thermograms and phase diagrams in known systems.	1	3



2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	39	4	0	0	0	43
Credit	3	0	0	0	0	3

3. Additional private study/learning hours expected for students per week.

3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from

each domain.)			
Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Describe the principles of solid state structures	<ul style="list-style-type: none"> - Using open discussion to link the previous knowledge to the current and future topics. - The students use the internet to prepare an essay about a recent advances related to the course 	<ul style="list-style-type: none"> - Written tests - Evaluate effective participation of students during lecture presentation - Home work duties assigned in e-learning site.
1.2	Identify crystal structures by applying basic crystallographic concepts		
1.3	Know the process for generation of X-ray radiation and its effects on matter		
1.4	Recognize the experimental use of the diffraction phenomenon		
1.5	Explain how to use powder diffraction data for characterizing cubic substances		
1.6	Understand diffraction intensities mathematically to structural parameters and derive extinction conditions		
1.7	Memorize the use of crystallographic data for a validated phase analysis		
1.8	Know how to analyze thermo-grams and phase diagrams in known systems		
2.0	Cognitive Skills		
2.1	Compare between different crystals	<ul style="list-style-type: none"> - Using brain storming at the beginning of each lecture in order to stimulate the students towards the new topic of the course. - Enhancing open discussion during the lecture. 	<ul style="list-style-type: none"> -discussion and interactive note realize the extent of the student scientific material that displays - Written tests
2.2	Discover experimental use of the diffraction phenomenon		
	Apply how to use powder diffraction data for characterizing cubic substances		
	Interpret crystallographic data for a validated phase analysis		
3.0	Interpersonal Skills & Responsibility		
3.1	Encourage students towards responsibility for themselves and toward others.	- duties for individual students on e-learning	- Assessment of assignments

3.2	Encourage the work in group to make the students aware with responsibility	site where each student depends on himself - Encourage the solving problems in groups during lecture - Making open discussion about certain recent topic of the course	includes portion of grade for effectiveness of investigation processes. - Personal performance in classroom.
3.3	Install self-learning character in the student		
3.4	Guide student about ethics of dealing with his colleagues and with the instructors and supervisor		
4.0	Communication, Information Technology, Numerical		
4.1	Able to communicate with his colleagues across all available tools	- Applying the smart teaching - assignments by using the e-learning tools. - Given 5 min at the end of each lecture to selected one of students to re-mentioned again the main topics introduced in lecture	Final and midterms exams include different problems need numerical and technical skills - Develop degrees on the active participation of students in taking out en masse to some lectures
4.2	Enrich the knowledge in information technology that will enable them to gather, interpret, and communicate information and ideas		
4.3	Must have sufficient information about how to thinking to solve problems that will enable them to apply in interpreting and proposing solutions		
4.4	Communicate via the available electronic tools		
4.5	Use of search engines across the Web		
5.0	Psychomotor		
5.1	Not applicable		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Assignments and activities.	--	10 %
2	Midterm Exam.	8	30 %
3	Final Exam.	15-16	60 %
4	Total	100 %	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Office Hours: 3 hours

Total 3 hrs. of office hours for individual student consultations and academic advice per week in e-learning as mentioned before.

E Learning Resources

1. List Required Textbooks

- **A. R. West, Solid State Chemistry and applications, John Wiley & Sons 1985**
- **Anthony R. West, Solid State Chemistry and its Applications, 2nd Edition, 2013**

2. List Essential References Materials (Journals, Reports, etc.)

- **A. R. West, Basic Solid State chemistry, John Wiley & Sons 1988**
- **W. Dietze, Crystals, Growth, Properties and applications, 1981**
- **D. McKie, Essential of Crystallography, 1986**

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- **Anthony R. West, Solid State Chemistry and its Applications, 2nd Edition, 2013**
- - **A. R. West, Basic Solid State chemistry, John Wiley & Sons 1988.**

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

<http://www.mx.iucr.org/iucr-top/comm/cteach/pamphlets/13/node5.html>

<http://img.chem.ucl.ac.uk/sgp/mainmenu.htm>

www.shef.ac.uk/.../solid-state-chemistry-applications-msc

www.simplybooks.in/solid-state-chemistry-its-anthony-r-book..

www.infibeam.com/.../solid-state-chemistry-its-applications/9...

<http://www.seas.upenn.edu/~chem101/sschem/solidstatechem.html>

<http://www.webqc.org/symmetry.php>

http://en.wikipedia.org/wiki/Molecular_geometry

http://en.wikipedia.org/wiki/Molecular_graphics

http://butane.chem.uiuc.edu/cyerkes/Chem102AEFa07/Lecture_Notes_102/newL102.htm-ecture%2014

/Science/Chemistry/Lewis_Structures_VSEPRhttp://www.wyzant.com/Help

http://www2.chemistry.msu.edu/faculty/reusch/VirtTxtJml/intro3.htm

www.shf.ac.uk/.../solid-state-chemistry-applications-msc

www.simplybooks.in/solid-state-chemistry-its-anthony-r-book..

www.infibeam.com/.../solid-state-chemistry-its-applications/9...

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- **Isisdraw and Chemdraw and Chemoffice Software**

http://scholle.oc.uni-kiel.de/herges/modeling/gliederung.html

http://chem-faculty.ucsd.edu/trogler/GroupTheory224/Grouptheory.html

http://phycomp.technion.ac.il/~ira/types.html

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Smart classes are needed equipped with Internet access (scheduled for 3 hours once a week).**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Common computer lab containing at least 25 computer sets.**

- **High speed internet access.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list): **Required programs specific for chemistry students**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- **Confidential completion of standard course evaluation questionnaire.**

- **Focused group discussion with small groups of students.**

- **Review with the department chairman.**

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

<ul style="list-style-type: none">- Observations and assistance from colleagues.- Independent assessment of standards achieved by students.- Independent advice on assignment tasks
3 Processes for Improvement of Teaching <ul style="list-style-type: none">- Workshops on teaching methods.- Review of recommended teaching strategies.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) <ul style="list-style-type: none">- Check marking by an independent member teaching staff of a sample of student work.- Periodic exchange and remarking of tests or a sample of assignments with staff at another institution.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none">- Periodic revision of the course from concerned parties in the department and college, and improving it according to what is known in distinguished universities worldwide.

Name of Instructor: Prof. **Dr. Nashwa El-Metwaly**

Signature: _____ Date Report Completed: **2017**

Name of Field Experience Teaching Staff:

Program Coordinator:

Signature: _____ Date Received: _____

