

**ATTACHMENT 2 (e)**

**Course Specifications**

**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation &  
Assessment**

**Course Specifications  
(CS)**

## Course Specifications

Institution: **Dammam University**

Date

A. Course Identification and General Information

1. Course title and code: <b>Inorganic spectroscopy CHEM 436</b>	
2. Credit hours : <b>2 credit hours</b>	
3. Program(s) in which the course is offered. <b>Chemistry</b> (If general elective available in many programs indicate this rather than list programs)	
4. Name of faculty member responsible for the course :	
5. Level/year at which this course is offered: <b>8\4</b>	
6. Pre-requisites for this course (if any): <b>Coordination Chemistry</b>	
7. Co-requisites for this course (if any): No	
8. Location if not on main campus: <b>College of Science for Girls \ Dammam</b>	
9. Mode of Instruction (mark all that apply)	
a. traditional classroom %	<input type="text" value="*"/> What percentage? 70
b. blended (traditional and online) percentage?	<input type="text"/> What
c. e-learning What percentage?	<input type="text"/>
d. correspondence What percentage?	<input type="text"/>
f. other %	<input type="text" value="*"/> What percentage? 30
% Comments:	

## B Objectives

1. What is the main purpose for this course?

- **Getting to know the student on the nature of electromagnetic radiation and its properties and its types and methods of measurement**
- **Student to recognize some of the laws of absorption in the field of the visible spectrum and on ultraviolet and infrared spectrum, as well as nuclear magnetic resonance and its applications on some vehicles and non-organic complexes**
- **Recognize that on the basis of electronic transitions and their rules and their impact on the colors of compounds and complexes of harmonizing**
- **Types of vibrations of complex compounds in the IR spectrum and its applications and the factors affecting the absorption**
- **Recognize that the student nuclear magnetic resonance of hydrogen and carbon and fluorine compounds and their applications in the complex, as well as factors affecting it**

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)

- **Lecturing and simplify the information with the use of information technology and the Internet, or references to the new changes of modern research in the field of study.**
- **The use of visual display PowerPoint.**
- **Linking the lecture content with the presentation of new researches published recently.**
- **The debate and the exchange of roles with the comment on the mutual debate between professor and the students.**
- **Access to modern research and studies related to the topics of decision and take advantage of them.**
- **Some duties assigned to the students and then discussed together.**

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
<b>Electromagnetic radiation - a nice visible rays and ultraviolet - electronic transfer - methods of measuring radiation</b>	1	2
<b>Lambert Law - Pierre absorption - the effect of solvents - applications on inorganic compounds</b>	1	2
<b>The characteristic absorption of inorganic compounds - applications on the use of the visible spectrum inorganic compounds - Use on ultraviolet complexes in harmonizing</b>	1	2
<b>Absorption and stability energy complexes – spectra chemical series of complexes and colors - the effect of energy stability and oxidation states of metals on the colors of inorganic compounds</b>	1	2
<b>Infrared spectroscopy - types of vibrations in groups - the properties of infrared - How to get infrared</b>	1	2
<b>Shades of the carbonyl group in the infrared - the effect of symmetry and asymmetry - the effect of replacing the carbonyl group - Forum</b>	1	2
<b>Inorganic infrared spectroscopy of complexes and applications</b>	2	4

<b>NMR - magnetic properties of nuclei - the number of tweaking and atomic number - get a resonance - NMR spectrum of the protons - Websites lines</b>	1	2
<b>Factors affecting the sites packages - packages fission absorption and Pascal triangle - NMR spectrum for C P F</b>	1	2
<b>Determine installation - the interpretation of nuclear magnetic spectra Buzz - factors affecting the chemical displacement - the impact of consistency on the metal</b>	1	2
<b>Fixed double - Factors Affecting the constant double – coordination number – electronegativity - oxidation state</b>	1	2
<b>Hydrogen complexes - spectral editing - nice ways Buzz nuclear magnetic mono and two-dimensional</b>	2	4

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	<b>28</b>					<b>28</b>
Credit	<b>2</b>					<b>2</b>

3. Additional private study/learning hours expected for students per week. **2 hour\ weak**

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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.)

Cod	NOE Learning Domains	Course Teaching	Course Assessment
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#	And Course Learning Outcomes	Strategies	Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Recognize the characteristics of the spectrum.	Lecturing with simplifying the information by using illustrative	Questions at the end of each lecture
1.2	Distinguish between characteristics of the types of spectrum.	The using of visual display such as	Participation and positive incentives during the
1.3	Understand the different types of electronic transition in molecules	Renewal and exciting during the presentation	Sudden oral tests
1.4	Recognize how to prepare the sample for I.R analysis.	Discussion, comments and asking questions	Quarterly tests
1.5	Recognize the use of UV,Vis. spectra for the study of inorganic molecules .	Recent research related to the subject	Evaluation of research and working papers related to the course and its objectives, and assigned to students as an activity and
1.6	• recognize how to make the interpretation of nuclear magnetic spectra.	Constructive discussion	Participation and positive incentives during the
1.7	• recognize the NMR spectrum for C, P, F	Solving exercises	Activity and home works
<b>2.0</b>	<b>Cognitive Skills</b>		
2.1	Distinguish between the types of electromagnetic radiation	Deep discussion with the students by asking some diverse and exciting oral questions during the	Ask questions at the end of the lecture
2.2	Distinguish different modes of vibration of molecules	Linking between skills and reality and what surrounds us	Evaluation the results of the research done by the students as well as the paper work, and involve them in the evaluation process.
2.3	To apply the rules spectroscopy of coordination compounds.	Trying to explain the issues in regular and motivated way in order to increase and improve the focusing of the students during the	Achievement tests include (oral questions, quarterly tests, the final test)
2.4	Understand how to make the interpretation for uv, vis, ir	examples	
2.5	Requesting that the multiplicity of uses of the spectroscopy devises	Linking between skills and reality and what surrounds us	Ask questions at the end of the lecture
2.6	Acquire the skill of the discuss of nmr, ir for inorganic compounds .	Constructive discussion	Participation and positive incentives during the lecture
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	The ability to form groups and the distribution of tasks	To strengthen the confidence of the students and encourage them to attend lectures,	Request a share presentation in front of the students through discussions
3.2	Skill presentation in front of others	To raise the spirit of cooperation among students	

3.3	Skill constructive criticism, dialogue and discussion with others	Cooperation, tolerance and compassion while dealing with colleagues	Involve and discuss the students during the evaluation of their reports
3.4	Ability to clearly express an opinion and accept the opinions of others	Sharing duties (interactive workshop / joint presentation / report / prepare working	
3.5	The ability to analyze and educate.		
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	The ability to use e-mail to communicate with the instructor and other students	Request the students to send their home works and research via	Written tests
4.2	The ability of the students to access useful sites on the Internet, in order to search for specific data and information	Cooperative Education and visit libraries	
		Asking the students to exploit some useful sites in the internet associated with the topics of decision for further	Evaluation of research projects and worksheets
		Giving some additional marks (incentives) to the student who supports their research with information from useful sites in the internet	Evaluation of research projects and worksheets
<b>5.0</b>	<b>Psychomotor</b>		
5.1	Not		

5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top )

Course LOs #	Program Learning Outcomes (Use Program LO Code #s provided in the Program							
	1.1	1.2		2.1	3.2		4.1	
1.1								
2.1			<b>Not applicabl</b>					

6. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project,	Week Due	Proportion of Total
1	First written exam	7 <sup>th</sup> week	20%



2	Short report related to the course content	8 <sup>th</sup> week	10 %
4	Second written exam	13 <sup>th</sup> -14 <sup>th</sup> week	20 %
5	Final written exam	End of semester	50 %

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)

### E Learning Resources

1. List Required Textbooks

- Advanced Inorganic chemistry, a comprehensive Text, F.A. cotton and G. Wilkinson, 4<sup>th</sup> edition, New York, Interscience publishers, 1980.
- Inorganic Spectroscopic Methods, Oxford Chemistry Primers, Alan Brisdon, 1998.
- NMR spectroscopy in Inorganic chemistry, Oxford Chemistry Primers, Jonathan A. Iggo 1999.

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

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

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

- 1- [www.scopus.com](http://www.scopus.com)
- 2- [www.wikipedia.org](http://www.wikipedia.org)
- 3- [www. Springerlink.com](http://www.Springerlink.com)
- 4- [www.science direct .com](http://www.science direct .com)

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

## PowerPoint

### 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.)

**Halls with capacity of 45 students conditioned and equipped with a display device, an electronic panel and a computer as an integrated unit.**

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

**A laptop computer, for PowerPoint presentations of lectures, a remote control and laser pointer.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

**The need of a special library for faculty members.**

**The need of software for calculations, plotting and statistical operations.**

### G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

**Preparation of a questionnaire to measure the level of achievement of students in the course, and to evaluate the effectiveness of the teaching method used.**

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

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- Periodic developmental, internal and external review.
- Evaluation of the students of the performance course's teacher and those of the visiting professors through questionnaires.
- Evaluation of the students for the quarterly and final tests the through questionnaires.

### 3 Processes for Improvement of Teaching

- **Develop the capacity of the professor by training programs to guide them to use oriented ways of thinking and brainstorming and collaborative learning.**
- **Follow-up, which was linked to the new decision or effective ways of teaching.**
- **Implement the recommendations of the Commission study plans about the decision.**
- **The application of the directives of the management department for the development of teaching performance.**

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)

- **Periodically Revision of Course Description and vocabulary by a committee of programs and study plans.**
- **Hosting a visiting professor to evaluate the decision and scalability.**
- **Workshops for teachers scheduled.**
- **Update sources of learning for the decision to make sure that keep pace with the modern developments.**
- **Statistical analysis of the results of the outcome of the students and take advantage of them in the Calendar and development.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodically Revision of Course Description and vocabulary by a committee of programs and study plans.**
- **Hosting a visiting professor to evaluate the decision and scalability.**
- **Workshops for teachers scheduled.**
- **Update sources of learning for the decision to make sure that keep pace with the modern developments.**
- **Statistical analysis of the results of the outcome of the students and take advantage of them in the Calendar and development.**