



## Course Specifications

<b>Course Title:</b>	<b>Inorganic Chemistry 2</b>
<b>Course Code:</b>	<b>2042204-3</b>
<b>Program:</b>	<b>Bachelor in Chemistry</b>
<b>Department:</b>	<b>Department of Chemistry</b>
<b>College:</b>	<b>College of Sciences</b>
<b>Institution:</b>	<b>Taif University</b>

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## A. Course Identification

<b>1. Credit hours:</b> 3 (Theoretical)
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 6 <sup>th</sup> Level/ 2 <sup>nd</sup> Year
<b>4. Pre-requisites for this course (if any):</b> Inorganic Chemistry 1 (2042102-2)
<b>5. Co-requisites for this course (if any):</b> NA

## 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	40	80 %
2	Blended	10	20%
3	E-learning	-	-
4	Distance learning	-	-
5	Other	-	-

## 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	40
2	Laboratory/Studio	-
3	Tutorial	-
4	Others (Blended)	10
	<b>Total</b>	<b>50</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description

The transition elements play important roles in our daily life and in keeping the living organisms alive. Many materials those we encounter each day contain transition element such as iron, copper, nickel etc., in one form or another. Production of various materials using chemical processes invariably involved catalysis which are mostly transition metal and their compounds. The course describes the roles of transition elements in biological systems or in chemical processes involving them, it's essential to understand the principals underlying the chemistry of these elements.

### 2. Course Main Objective

The course aims to recognize the theoretical aspects of reactions, electronic configurations, the basic concept and general methods of industrial production of d-block elements.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding:</b>	
1.1	List the characteristics and behavior of transition metals	K2
1.2	Determine the role of transition metals in industrial applications	K3

CLOs		Aligned PLOs
<b>2</b>	<b>Skills:</b>	
2.1	Predict the magnetic behavior for different transition metal ions	S1
2.2	Explain the importance of inorganics for environmental and economic issues	S3
<b>3</b>	<b>Values:</b>	
3.1	Illustrate the concept of personal responsibility for achieving duties by teamwork.	V1

## C. Course Content

No	List of Topics	Contact Hours
1	General properties of the transition elements: physical, chemical, magnetic catalytic properties. These will include: Atomic radius, Density, melting and boiling points, ionization energy, electronic configuration and oxidation states and colours.	5
2	Scandium group: Chemical properties of elements and compounds-separation of elements – general uses	5
3	Titanium group: Chemical properties of titanium and its compounds, extraction and uses.	5
4	Vanadium group: Chemical properties and uses of Vanadium, Oxo-vanadium compounds; extraction and reactions.	5
5	Chromium group: General properties and uses of compounds; extraction and preparation.	5
6	Manganese group: General properties, chemistry of Manganese compounds; extraction and uses.	5
7	Iron group: General properties and uses of iron, chemistry of Iron compounds, types of oxides, complexes of iron, extraction of iron and steel production, corrosion.	5
8	Cobalt group: General properties, chemistry of Cobalt compounds, extraction and application, isotopes of Cobalt.	5
9	Nickel group: General properties, chemistry of Nickel compounds, complexes, extraction and applications.	5
10	Copper and zinc: General properties, chemistry of Copper and Zinc compounds, complexes, extraction and applications.	5
<b>Total</b>		<b>50</b>

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
1.1	List the characteristics and behavior of transition metals	Lecture	Written exam
1.2	Determine the role of transition metals in industrial applications	Lecture	Written exam
<b>2.0</b>	<b>Skills</b>		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.1	Predict the magnetic behavior for different transition metal ions	Discussion	Homework Assignments
2.2	Explain the importance of inorganics for environmental and economic issues	Discussion	Homework Assignments
3.0	<b>Values</b>		
3.1	Illustrate the concept of personal responsibility for achieving duties by teamwork.	Collaborative Learning	Individual presentations

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework Assignments (Electronic)	Throughout Semester	10%
2	Individual presentations	Throughout Semester	10%
3	Mid Term Exam	6	30%
4	Final exam	11/12	50%

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

### Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Commitment to the rules of the Academic Advising Department at the university in accordance with the academic guidance manual approved by the university and the attached forms, there are different arrangements made by teaching staff to support student consultations including;

- Office hours: 8 hours per a week for each academic member.
- Academic guidance: an academic member has a number of students to guide them throughout degree journey.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<ul style="list-style-type: none"> <li>Inorganic Chemistry, D. Shriver and P. Atkins (2010), Oxford University Press, Latest Edition. ISBN: 978-0199236176. <a href="https://tinyurl.com/4uw2vcdj">https://tinyurl.com/4uw2vcdj</a></li> </ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>Chemistry, Science of Change, D. W. Oxtoby, W. A. Freeman, T. F. Block (1998). Saunders. College Publishing, Philadelphia (USA), Latest Edition. ISBN: 978-0030331886. <a href="https://tinyurl.com/3szuev8s">https://tinyurl.com/3szuev8s</a></li> </ul>
<b>Electronic Materials</b>	<ul style="list-style-type: none"> <li>Saudi Digital Library (SDL) <a href="https://apps.tu.edu.sa/sdl/default.aspx">https://apps.tu.edu.sa/sdl/default.aspx</a></li> </ul>
<b>Other Learning Materials</b>	<ul style="list-style-type: none"> <li>Principles of Modern Chemistry, Oxtoby, David W., Gillis H. P., Campion, Alan. (2008). Thomson Brooks/Cole: Belmont, CA (USA), Latest Edition. ISBN: 978-0534493660. <a href="https://tinyurl.com/4wff3c5r">https://tinyurl.com/4wff3c5r</a></li> </ul>

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"><li>Lecture hall with 100 seats.</li></ul>
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"><li>Computer and data show with Wi-Fi access.</li></ul>
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching and assessment	Students	Survey (indirect method)
Extent of achievement of course learning outcomes	Program leader	Reports (Direct method)
Quality of learning resources	Peer referees Students	Reports (Direct method) Survey (indirect method)

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	<b>Department Council/ Quality assurance committee</b>
<b>Reference No.</b>	2-5-1444
<b>Date</b>	01/11/2022