

7.7 Advanced Inorganic Chemistry

Module Name Advanced Inorganic Chemistry		Module Code CO-442	Level (type) Year 2 (CORE)	CP 5
Module Components				
Number	Name	Type	CP	
CO-442-A	Advanced Inorganic Chemistry	Lecture	5	
Module Coordinator Ulrich Kortz	Program Affiliation • Chemistry	Mandatory Status Mandatory for Chemistry		
Entry Requirements		Frequency	Forms of Learning and Teaching	
Pre-requisites		Annually	<ul style="list-style-type: none"> Lecture (35 hours) Tutorial (10 hours) Private Study Lecture (80 hours) 	
<input checked="" type="checkbox"/> General and Inorganic Chemistry	Co-requisites <input checked="" type="checkbox"/> None	Knowledge, Abilities, or Skills <ul style="list-style-type: none"> 		
Recommendations for Preparation				
Early reading, extensive note taking and self-testing, work through practice problems, fully understand the material before entering laboratory and the risks associated with the daily goals.				
Content and Educational Aims				
This Module introduces advanced concepts of inorganic chemistry, such as Molecular Structure and Bonding (VB theory, MO theory, semiconductors), Symmetry and Group Theory, Structures of Solids (metals, ionic solids), d-metal Complexes (structure and symmetry, bonding and electronic structure, reactions of complexes), The Electronic Spectra of Complexes (electronic spectra of atoms vs complexes, bonding and spectra of M-M bonded compounds).				
Intended Learning Outcomes				
By the end of the module, the student will be able to				
<ul style="list-style-type: none"> discuss advanced concepts of inorganic and organometallic chemistry; master various topics such as synthesis of inorganic compounds, bonding, structure, etc; explain what are coordination compounds, their nomenclature and isomerism; determine the electronic structure of d-metal complexes and explain their properties (correlate between electronic structure and properties); explain the elements in the periodic table and the periodic properties of these elements. predict the geometries of inorganic compounds; determine the structure and symmetry of molecules and correlate between symmetry and properties; 				

7.11 Bioprocess Engineering

Module Name Bioprocess Engineering		Module Code CO-444	Level (type) Year 2 (CORE)	CP 5
Module Components				
Number	Name	Type	CP	
CO-444-A	Bioprocess Engineering	Lecture and tutorial	5	
Module Coordinator Marcelo Fernandez Lahore	Program Affiliation • Chemistry	Mandatory Status Mandatory for Chemistry		
Entry Requirements		Frequency	Forms of Learning and Teaching	
<i>Pre-requisites</i>	<i>Co-requisites</i>	Annually	<ul style="list-style-type: none"> Lecture and tutorial (45 hours) Private study (45 hours) Exam preparation (35 hours) 	
<input checked="" type="checkbox"/> Introduction to Biotechnology <input checked="" type="checkbox"/> Industrial Biotechnology	<input checked="" type="checkbox"/> None			
		1 semester	125 hours	
Recommendations for Preparation				
None				
Content and Educational Aims				
<p>Biotechnology advances in the laboratory require appropriate strategies for implementation in industrial practice. One main pre-requisite for exploitation is the ability to efficiently scale-up any processes involved for final product delivery to the market. Process biotechnology is concerned with the design, dovetailing, performance evaluation and final implementation of unit operations. Examples are fermentation, solid-liquid separation, extraction and leaching, adsorption and chromatography. Every production scheme has to be validated in terms of product quality and processing costs. Software packages may be employed to illustrate processing alternatives.</p>				

7.21.2.11 Sustainable Value Creation with Biotechnology. From Science to Business

Module Name Sustainable Value Creation with Biotechnology. From Science to Business.			Module Code JTBQ-BQ-011	Level (type) Year 3 (Jacobs Track)	CP 2.5
Module Components					
Number	Name			Type	CP
JTBQ-011	Biotechnology: From Science to Business			Lecture - Tutorial	2.5
Module Coordinator Marcelo Fernandez Lahore		Program Affiliation <ul style="list-style-type: none"> Jacobs Track - Big Questions 		Mandatory Status <ul style="list-style-type: none"> Mandatory for Chemistry Mandatory elective for students of all undergraduate study except IEM 	
Entry Requirements			Frequency	Forms of Learning and Teaching	
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills		annually	<ul style="list-style-type: none"> Lecture and Tutorial (17.5 hours) Private Study (45 hours)
<input checked="" type="checkbox"/> None	<input checked="" type="checkbox"/> None	<ul style="list-style-type: none"> the ability and openness to engage in interdisciplinary issues on bio-based value creation media literacy, critical thinking and a proficient handling of data sources 		Duration 1 semester	Workload 62.5 hours
Recommendations for Preparation https://www.ctsi.ucla.edu/researcher-resources/files/view/docs/EGBS4_Kolchinsky.pdf https://link.springer.com/article/10.1057/jcb.2008.27 https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf					