



## SYLLABUS

### A. Course Description

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Course Level	Language
CHM	414	Industrial Inorganic Chemistry (1)	3	2	2	0	6	CHM 313	7	English

Topics covered in the course include the introduction on the water and the methods of water treatment. The course will be provide the students with Basic information for Nitrogen, Phosphorus, and Potash, Nitrogen-Containing Fertilizers, Sulfur and Sulfur Compounds, Alkalis and Related products and the halogens. It gives also information on ceramics, classification of ceramics and ceramic manufacturing processes glass, composition of glass and manufacturing procedure. It provides information on extractive metallurgy. The practical part consists of a set of experiments that reinforce the module concepts. At the end of this course the student will be able to

- Know the basic information for industrial requirements and methods of preparation.
- Develop awareness on the contribution of industry to community welfare.
- Visualize the scope of the Saudi chemical industry relevant to provision of pure water, fertilizers and metals.
- Know the fundamental chemical processes that followed in chemical industry
- Carry out experiments to analyze ammonium and phosphate fertilizers.

### B. References: Required Textbook & Internal Website

I shall use

*Inorganic Chemistry an Industrial and Environmental Perspective*, T.W. Swaddle, (1997) Elsevier Inc. ISBN: 978-0-12-678550-0.

**Students are required to purchase the textbook/materials (it is an obligation).** The book contains the lecture notes as well as activities for the students to take part in; the book serves as a workbook.

Other references:

- *Industrial Inorganic Chemistry*, Karl H. Buchel, Hans H. Moretto and Peter Woditsch, (2<sup>nd</sup> Ed), WILEY-VCH Verlag GmbH, D-69469 Weinheim (Federal Republic of Germany), 2000 ,(ISBN: 3-527-29849-5)
- *Applied Chemistry, Theory and Practice*, O.P. Vermani, A.K. Narula, (2<sup>nd</sup> Ed), 1995, New Age International (P) Ltd., Publishers Published by New Age International (P) Ltd., Publishers, ISBN (13) : 978-81-224-2494-

Google Classroom Webpage: <http://www.imamm.org/>



### C. Topics Outline

**Disclaimer:** this is a very fast-paced course. There will be little time-if any-for review. What follows is an approximate outline of the pace of the course. We may go faster or slower, contingent on the class response. The tentative list of topics to cover:

#### a. Theory:

- 1. Water:** Economic Importance, Production of Potable Water, Filtration, Production of Soft or Deionized Water, Water Hardness and its treatment. Nitrogen-Containing Fertilizers: Economic Importance, General Information Importance of Ammonium Sulfate, Importance of Ammonium Nitrate, Importance of Urea, Manufacture of Nitrogen-Containing Fertilizers. Phosphorus and its Compounds, Phosphorus and Inorganic Phosphorus Compounds, Products, Phosphoric Acid, Phosphoric Acid Salts, Phosphorus.. Potassium-Containing Fertilizers: Occurrence of Potassium Salts, Economic Importance of Potassium-Containing Fertilizers, Manufacture of Potassium-Containing Fertilizers, N-P-K fertilizer: sources and forms of fertilizers.
- 2. Sulfur and Sulfur Compounds:** Sulfur and Sulfur Compounds: Sulfur, Economic Importance, Applications, Sulfuric Acid, Starting Materials for Sulfuric Acid Manufacture, Sulfuric Acid from Sulfur Dioxide.
- 3. The Halogen:** The Chlorine, Chlorofluorocarbons, Oxides and Oxoacids of Chlorine, Fluorine and Fluorine Compounds, Bromine and Iodine, Extraction, Uses and Hazards of Bromine.
- 4. Mineral Fertilizer:** Phosphorus-Containing Fertilizers, Economic Importance, General Information, Importance of Superphosphate, Importance of Triple Superphosphate, Basic Slag (Thomas) Phosphates Nitrogen-Containing Fertilizers: Economic Importance, General Information Importance of Ammonium Sulfate, Importance of Ammonium Nitrate, Importance of Urea, Manufacture of Nitrogen-Containing Fertilizers. Potassium-Containing Fertilizers: Occurrence of Potassium Salts, Economic Importance of Potassium-Containing Fertilizers, Manufacture of Potassium-Containing Fertilizers.

#### b. Practical:

Determination of water hardness, Determination of nitrogen in ammonium nitrate, Determination of nitrogen in Urea, Determination of phosphorous, Determination of potassium, Determination of water in fertilizer, Determination of sulphur, Determination of chloride, Soap Creation (hot method), Soap Creation (cold method), Introduction to N-P-K fertilizer, Manufacture and analysis of bench scale N-P-K fertilizer.

### D. Exams & Grading System

The semi-official dates of the exams for this course, with all the caveats, that the word “semi-official” entails, can be found here:

- **Midterm 1:** 6<sup>th</sup> or 7<sup>th</sup> week      & **Midterm 2:** 11<sup>th</sup> or 12<sup>th</sup> week
- **Quizzes & Homeworks: During the semester**

Your course grade will be based on Final Exam, Midterms, Homework, Quizzes, Participation, Attendance and Project.

<b>Midterm 1:</b> 10 %	<b>Midterm 2:</b> 10 %	<b>Final Exam:</b> 40 %
<b>Laboratory:</b> 30 %		<b>Quizzes; Homework &amp; Attendance &amp; Participation:</b> 10 %



### Grading distribution:

A+: [95, 100], A: [90, 95], B+: [85, 90], B: [80, 85], C+: [75, 80], C: [70, 75], D+: [65, 70],  
D: [60, 65], F: [0, 60].

### E. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. (“Immediate family” is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

[Executive Rules for Study Regulations and Examsgoo.gl/ykm7t3](https://www.examsgoo.gl/ykm7t3)

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