Sul Ross State University
Syllabus for CHEM 2402 (Fall 2018)

Class: Inorganic Chemistry II
Instructor: Dr. Yanfeng Yue
Room: WSB 307; Office: WSB 217
Time: TR 10:00-10:50 am
Office Hours: MWF 11:00-12:00; TR 800-9:30
Office Phone: (432) 837-8217
Email: yanfeng.yue@sulross.edu

Student Learning Objectives (SLO):

A student graduating with the ***chemistry major*** is expected to demonstrate that (s)he is able to do the following:
1. Organic Chemistry—Students will be able to draw organic molecular structures and explain organic reactions, stereochemistry, structural analysis and reactions in biological systems.
2. Inorganic Chemistry—The student will be able to demonstrate understanding of coordination chemistry, valence theory, elementary actions and advanced molecular theory.
3. Analytical Chemistry—The student will be able to demonstrate an understanding of theory of analytical chemistry and conduct analytical analysis, including data analysis and calibration, equilibrium chemistry, gravimetric analysis, titrimetric analysis, spectroscopic analysis, and electrochemical analysis.
4. Physical Chemistry—The student will be able to demonstrate an understanding of the application and theory of physical chemistry, including topics such as atomic structure, electrochemistry, surface chemistry, solid-state chemistry, and thermodynamics.
5. Research—The student will collect and analyze published chemical literature and undertake a chemistry research project.

Core Objectives (CO):
1. **Interests of Chemistry** – Inspire and keep the students' interests of chemistry.
2. **Critical Thinking Skills** – Students will gain/improve their critical thinking ability by solving real life chemistry problems through inquiry, analysis, and evaluation of available information. Students will be tested on their critical thinking ability in exams and through lab experiments.
3. **Communication Skills** – Students will have the opportunity of improving communication skills through oral discussion and writing reports (i.e. observation, explanation, and conclusion, etc.) on the experiments done in the lab sessions.
4. **Empirical and Quantitative Skills** – Students will use the mathematical skills needed to manipulate and analyze numerical data obtained through experimentation in order to form conclusions.
5. **Teamwork** – Students will use team-spirit and consider different points of view to work effectively while conducting experiments as a team working toward a shared purpose or goal.
6. **Career Goals** – Students will be trained in a broad set of skills in many disciplines that are ideal for pursuing jobs in industry or academics in graduate schools.

Lecture sessions are designed to fulfill PLO 1, CO – 1, 2, 3, 4, and 5. Lab sessions are designed to fulfill PLO 3, CO 1-6.

Text: Inorganic Chemistry by Catherine E. Housecroft (4th Edition). The following chapters will be covered:

10 Hydrogen 299
11 Group 1: the alkali metals 326
12 The group 2 metals 348
13 The group 13 elements 371
14 The group 14 elements 426
15 The group 15 elements 485
16 The group 16 elements 546
17 The group 17 elements 591
18 The group 18 elements 624
19 d-Block metal chemistry: general considerations 639
20 d-Block metal chemistry: coordination complexes 665
21 d-Block metal chemistry: the first row metals 716
22 d-Block metal chemistry: the heavier metals 778
23 Organometallic compounds of s- and p-block elements 848
24 Organometallic compounds of d-block elements 887
25 Catalysis and some industrial processes 940
26 d-Block metal complexes: reaction mechanisms 976
27 The f-block metals: lanthanoids and actinoids 1002
28 Inorganic materials and nanotechnology 1033
29 The trace metals of life 1065

Homework: There will be problems assigned for each chapter. **NO LATE HOMEWORK WILL BE ACCEPTED.**

Examinations: There will be ***two midterm*** examinations and ***a final*** examination. The final is mandatory and will be comprehensive. **NO MAKE-UP EXAMS WILL BE GIVEN. Two midterm exams or final examination missing WILL RESULT IN FAILING THE COURSE.**
ATTENDANCE PRERESQUITE: BEING ABSENT FROM MORE THAN 9 LECTURES WILL RESULT IN FAILING THE COURSE. PERCENTAGE BREAKDOWN OF MARKS:
Homework: 15%
Each Midterm Exam (15%): 15% × 2
Lab: 15%
Final Exam: 40%
Final Exam (from Chapter 10 to chapter 29) (Dec 7, Friday): 10:15 a.m. - 12:15 p.m.

Course Calendar
Lecture 1 (August 27): Discussion on Syllabus, Chapter 10 Hydrogen
Lecture 2 (August 29): Chapter 10 Hydrogen
Lecture 3 (August 31): Chapter 11 Group 1: the alkali metals
Sep. 3th, Labor Day Holiday
Lecture 4 (September 5): Chapter 12 The group 2 metals

Lecture 5 (September 7): Chapter 13 The group 13 elements
Lecture 6 (September 10): Chapter 14 The group 14 elements
Lecture 7 (September 12): Chapter 15 The group 15 elements
Lecture 8 (September 14): Chapter 15 The group 15 elements
Lecture 9 (September 17): Exam Review
Lecture 10 (September 19): Exam I Chapter 10-15
Lecture 11 (September 21): Chapter 16 The group 16 elements
Lecture 12 (September 24): Chapter 16 The group 16 elements
Lecture 13 (September 26): Chapter 17 The group 17 elements
Lecture 14 (September 28): Chapter 17 The group 17 elements
Lecture 15 (October 1): Chapter 18 The group 18 elements
Lecture 16 (October 3): Chapter 18 The group 18 elements
Lecture 17 (October 5): Chapter 19 *d*-Block metal chemistry: general considerations
Lecture 18 (October 8): Chapter 20 *d*-Block metal chemistry: coordination complexes
Lecture 19 (October 10): Chapter 20 *d*-Block metal chemistry: coordination complexes
Lecture 20 (October 12): Chapter 21 *d*-Block metal chemistry: the first row metals
Lecture 21 (October 15): Chapter 21 *d*-Block metal chemistry: the first row metals
Lecture 22 (October 17): Chapter 21 *d*-Block metal chemistry: the first row metals
Lecture 23 (October 19): Exam Review
Lecture 24 (October 22): Exam Review
Lecture 25 (October 24): Exam II Chapter 16-21
Lecture 26 (October 26): Chapter 22 *d*-Block metal chemistry: the heavier metals
Lecture 27 (October 29): Chapter 22 *d*-Block metal chemistry: the heavier metals
Lecture 28 (October 31): Chapter 23 Organometallic compounds of s- and p-block elements
Lecture 29 (November 2): Chapter 24 Organometallic compounds of d-block elements
Lecture 30 (November 5): Chapter 24 Organometallic compounds of d-block elements
Lecture 31 (November 7): Chapter 25 Catalysis and some industrial processes
Lecture 32 (**November 9**): Chapter 26 *d*-Block metal complexes: reaction mechanisms
Lecture 33 (**November 12**): Chapter 26 *d*-Block metal complexes: reaction mechanisms
Lecture 34 (**November 14**): Chapter 27 The f-block metals: lanthanoids and actinoids
Lecture 35 (November 16): Chapter 27 The f-block metals: lanthanoids and actinoids
Nov. 16 Last day to Drop
Lecture 36 (November 19): Chapter 28 Inorganic materials and nanotechnology
November 21-23: NO CLASS: THANKSGIVING HOLIDAY
Lecture 37 (November 26): Chapter 28 Inorganic materials and nanotechnology
Lecture 38 (November 28): Exam Review chapter 22-24
Lecture 39 (November 30): Exam Review chapter 25-27
Lecture 40 (December 3): Exam Review chapter 28, 29
Lecture 41 (December 5): Exam Review chapter 28, 29
December 6: Dead day
Final Exam (from Chapter 10 to chapter 29) (Dec 7, Friday): 10:15 a.m. - 12:15 p.m.

Students with Special Needs: *Sul Ross State University is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartze, M. Ed.,*

L.P.C., in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8203. E-mail: mschwartze@sulross.edu.

Scholastic Dishonesty: Students who violate the University rules on scholastic dishonesty are subject to penalties, including the possibility of an **F** in the course and/or dismissal from the University. All assignments (including homework) need to be individually completed and not copied from another student's work. Electronic submission of homework is accepted after hours (not recommended), but must be hand written and scanned (either with a scanner or a smart phone) and emailed to Dr. Yue at: yanfeng.yue@sulross.edu. Homework electronically completed in Microsoft Word or other similar programs will NOT be accepted.