



Syllabus: *CHM 121N Chemistry and Society*

Course Information

Course Prefix/Number: CHM 121N
Semester: Fall 2020
Class Days/Times: Asynchronous
Class

Credit Hours: 4
Course Title: Chemistry and Society
Room: NA

Instructor Information:

Name: Dr. Rajneesh Verma

Phone/Voice Mail: **520-383-1114**

E-mail: rverma@tocc.edu

Office location: Online

Office hours: *By appointment*

Course Description: This course covers the foundation of chemistry and its relationship to everyday experiences. Skills such as conversions and problem solving techniques are also covered. Students will be introduced to laboratory techniques and participate in experimental activities that promote the development of basic and advanced science process skills

Student Learning Outcomes: *Upon completion of this course, the student will be able to :*

1. Differentiate between physical and chemical properties and changes, and between elements, compounds, and mixtures.
2. Discuss current science problems and potential problems of the future.
3. Use appropriate chemical terminology and conventions to interpret symbols and formulas, balance chemical equations, name and write formulas for common inorganic compounds, and identify various types of chemical reactions.

4. Perform calculations involving the metric system, scientific notation, the mole concept, and concentration terms including molarity, percent, ppm, ppb and dimensional analysis.

5. Use periodic table to identify metals, nonmetals, and metalloids, and list general physical properties for each category including Lewis dot structure.

6. Identify and properly use lab equipment such as flasks, balances, beakers etc.

Course Outline:

I. Classification and Structure of Matter

A. Atomic, ionic, or molecular nature of all material

B. Atomic structure

C. Electronic arrangement

II. Radioactivity

A. Nuclear decay, radiation types

B. Power source

C. Societal implications, current usage

III. Compound Formation from Elements

A. The Periodic Table of Elements

- B. Metals and non-metals; their valence electrons, and periodic perspective*
- C. Atomic elements to ionic or molecular compounds; electron transfer and sharing*

IV. Electron Transfer: Electricity, Oxidation and Reduction

- A. The electrochemical cell*
- B. Construction of batteries*
- C. Corrosion, rust, and bleaching*

V. Acids, Bases and Salts

- A. Definition and reaction with indicator dyes*
- B. pH Scale*
- C. Common acids and bases; and their relative strengths*
- D. "Acid Rain" or other environmental topics related to pH*

VI. Chemical Quantities

- A. The mole concept*
- B. Calculation of molar mass of pure substances*
- C. Interconversion of mass, mole and number of particles*

D. Molar solutions

VII. Stoichiometry

A. The balanced equation

B. Equation molar and mass relationships

VIII. The Liquid State

A. Water and its unique properties

B. Solutions and solubility

C. Contaminants and purification

IX The Gas State

A. Comparison to solid, liquid states: particle density

B. Effects of temperature and pressure on volume

C. The atmosphere and atmospheric pressure

D. Modeling the gaseous state

X. Special Topics

A. Traditional Knowledge of Chemistry

B. Lab techniques: use of flasks, balances and other classroom

C. appropriate activities

D. Other special topics selected by instructor as relevant

Texts and Materials: The following books can also be used. (copy and paste the link in your browser)

Fundamentals of Chemistry by David E. Goldberg

http://dl.booktolearn.com/ebooks2/science/chemistry/9780073221045_fundamentals_of_chemistry_fe89.pdf

Holt Chemistry Textbook

<https://d3jc3ahdjad7x7.cloudfront.net/ZNoJ1D09txjL BX5b2iMhhpzYN2Lc9o36UnuL7MbNYFigssQW.pdf>

Lab Kits

CHM 121 is a lab loaded course and for that you have to purchase a kit. I am providing a link to purchase the kit. Please have this kit before the course begins.

<https://esciencelabs.com/productdisplay/2nd-edition-introductory-chemistry-version-4> (Links to an external site.)

(copy and paste the above link in the address bar of your browser)

A zoom meeting can be scheduled to help the students

Evaluations and Grading & Assignments:

90 and above is an A

80 - 89 is a B

70 - 79 is a C

60 - 69 is a D

Under 60 is Failing

Your grade will be determined by the following:

Evaluation	Points	Percent of total points
1 Exam	100 points (1 x100)	40 %
2 Quiz	40 points (2 x 20)	10%
8 Labs	80 points (8 x10)	25%
4 Homework	40 points (4 x 10)	15%
1 Lab exam	60 points (1 x 60)	10 %

Himdag Cultural Component: Course will explore existing elements, materials and environmental issues where this applies to culture chemical thinking to continue improving or restoring components of Himdag. Students will also formulate a personal ethic regarding the use of chemical thinking in science teaching and research, incorporating perspectives from Western science and TOCC Core values.

Policies and Expectations:

Course Policies:

- 1) Students are expected to attend each class., arriving on time, except in the case of an excused emergency.
- 2) Students are expected to contact instructor prior to absences, coming late to class or leaving early.
- 3) Unexcused late arrivals or early departures will count against attendance record.
- 4) Class participation and preparation are essential to student success. Students must read textual material, prepare for projects, complete required research as stated on the course schedule.
- 5) Students are expected to come to class prepared for class and having done any preliminary work required as per the course schedule.
- 6) Students are expected to stay in class and work diligently throughout the whole time. Sleeping, frequent/continued exiting from the class during the class period will constitute one (1) absence.

7) No cell phone use is allowed during class. Use of cell phones during class, unless permitted by instructor, is a violation of the T-So:son.

8) Submission of homeworks/assignments through emails are not allowed and will not be graded.

9) Failure to submit a project results in a grade of zero (0). An F is a better grade!

10) No work accepted after the last class

11) There are no extra credit work for this class

12) Please sign the lab participation form on canvas and upload it before the due date, without which you will not be able to get any grades for the lab and further administrative action may be taken.

Classroom Behavior

- Visitors may be only allowed at class sessions or on field trips with instructor approval, visitor's safety and behavior are the responsibility of the student.
- Possession of drugs, alcohol or firearms on college property is illegal.
- Food and beverages are allowed in classrooms at discretion of the instructor.
- Cellphones should be turned off during class, unless the instructor is allowing students to use their tools (calculator, internet access).
- Students creating disturbances that interfere with the conduct of the class or the learning of others will be asked to leave.
- Student behavior is also detailed in student handbook under Student Code of Conduct Violations

Make-up policy:

Late assignments are not accepted and will be given a zero. There is no make up policy unless documented evidence are provided for such makeup assignment(s)/homework(s) or at Instructor discretion.

Academic Integrity:

Violations of scholastic ethics are considered serious offenses by Tohono O'odham Community College, the Student Services Department, and by your instructor. Students may consult the TOCC Student Handbook sections on student code of conduct, on scholastic ethics and on the grade appeal procedure. Copies are available at Tohono O'odham Community College.

All work done for this class must be your own, or the original work of your group. While you may discuss assignments with other class members, the final written project must clearly be original. You may use work from books **and other materials**

if it is properly cited. Copying from a book without proper reference or from a person under any circumstances will result in an “F” for the assignment, and at the instructor’s discretion, possibly an “F” for the course. If you are uncertain about proper citations ask your instructor or the librarian.

Course Feedback:

All assignments will be graded and returned to the students promptly, typically within a week after the assignment is closed for handing in. E-mail and phone messages will be returned within two days. A student or the instructor may request a student conference at any time during the semester. Quarterly grade reports will be provided to each student, either in person, by email or via the electronic system of Canvas.

Attendance Policy

You are expected to arrive to class on time and be prepared to participate in each class period. Four unexcused absences may result in withdrawal and a “W” or “Y” will be recorded. You may request to be excused from class for religious observances and practices, for illness, for school or work-related travel or for personal or family emergency. If you will be absent, please notify the instructor as soon as possible (approved by Faculty Senate April 2014).

Incomplete Policy

Incomplete (I) grades are not awarded automatically. The student must request an "I" from the instructor who can choose to award an Incomplete only if all three of the following conditions are met:

1. The student must be in compliance with the attendance policy.
2. The student must have unavoidable circumstance that would prohibit the student from completing the course.
3. The student must have completed over 75% of the course requirements with at least a “C” grade.

Incompletes are not a substitute for incomplete work due to frequent absences or poor academic performance. Incomplete grades that are not made up by the end of the ninth week of the following semester will be automatically changed to an F if the agreed upon work, as stipulated on the written form signed by the instructor and the student when the I grade is awarded, is not completed.

Instructor Withdrawals

Students who have missed four consecutive classes (or the equivalent) not submitted any assignments nor taken any quizzes by the 45th day census report, due on [date of 45th day found in Academic Calendar on TOCC website] are assumed NOT to be participating in the class and may be withdrawn at the faculty member’s discretion. [faculty members should be clear in their withdraw policy, if you do not withdraw students please note in appropriate sections].

Student Withdrawals

Students may withdraw from class at any time during the first 2/3 of the semester without instructor permission and without incurring any grade penalty. Please be sure to withdraw yourself by [withdrawal deadline date found in Academic Calendar on TOCC website] if you do not expect to complete the class, otherwise you may receive an "F" grade.

Special Withdrawals (Y) Grade

The "Y" grade is an administrative withdrawal given at the instructor's option when no other grade is deemed appropriate. Your instructor must file a form stating the specific rationale for awarding this grade. "Y" grades are discouraged since they often affect students negatively. Your instructor will not award a "Y" grade without a strong reason.

Equal Access Statement/Disability Accommodations

Tohono O'odham Community College seeks to provide reasonable accommodations for qualified individuals with disabilities. The College will comply with all applicable regulations, and guidelines with respect to providing reasonable accommodations as required to ensure an equal educational opportunity. This process includes self-identifying as a student with a disability, providing supporting documentation of their disability, and being approved for services through the Disability Resources Office (DRO). It is the student's responsibility to make known to their instructor(s) the student's specific needs within the context of each class in order to receive appropriate accommodations. We will work together in order to develop an accommodation plan specifically designed to meet the individual student's requirements.

For more information or to request academic accommodations, please contact: Anthony Osborn, TOCC Disabilities Resource Coordinator, aosborn@tocc.edu, or 520-383-0033 for additional information and assistance.

Title IX

Tohono O'odham Community College encourages each student to have the knowledge and skills to be an active bystander who intervenes when anyone is observed or being harassed or endangered by sexual violence. Sexual discrimination and sexual violence can undermine students' academic success and quality of life on campus and beyond. We encourage students who have experienced or witnessed any form of sexual misconduct to talk about their experience and seek the support they need.

Confidential support and academic advocacy can be found with: Student Services Title IX Coordinator/Counselor, Alberta Espinoza, M.Ed. located in I-We:mta Ki: Room 18. Phone 520-383-0033 email: aespinoza@tocc.edu

Conduct: Bias, Bullying, Discrimination and Harassment

Tohono O'odham Community College faculty and staff are dedicated to creating a safe and supportive campus environment as a core value. Harassment based on age, class, color, culture, disability and ability, ethnicity, gender, gender identity and expression, immigration status, marital status, political ideology, race, religion/spirituality, sex, sexual orientation, and tribal sovereign status will not be tolerated.

Courses Outline:

I. Classification and Structure of Matter

[\(8/17- 9/7\) Lab00-Lab04](#)

- A. Atomic, ionic, or molecular nature of all material
- B. Atomic structure
- C. Electronic arrangement

II. Radioactivity

[\(9/7-9/14\) 1_HW](#)

- A. Nuclear decay, radiation types
- B. Power source
- C. Societal implications, current usage

III. Compound Formation from Elements

[\(9/14-9/28\), Lab05-06](#)

- A. The Periodic Table of Elements
- B. Metals and non-metals; their valence electrons, and periodic perspective
- C. Atomic elements to ionic or molecular compounds; electron transfer and sharing

IV. Electron Transfer: Electricity, Oxidation and Reduction

[\(9/28-10/5\), HW_2, 1_QUIZ](#)

- A. The electrochemical cell
- B. Construction of batteries

C. Corrosion, rust, and bleaching

V. Acids, Bases and Salts

(10/5-10/19), Lab-07

A. Definition and reaction with indicator dyes

B. pH Scale

C. Common acids and bases; and their relative strengths

D. "Acid Rain" or other environmental topics related to pH

VI. Chemical Quantities

(10/19 -10/26) 2_Quiz, 3_HW, Lab-08

A. The mole concept

B. Calculation of molar mass of pure substances

C. Interconversion of mass, mole and number of particles

D. Molar solutions

VII. Stoichiometry

(10/19-10/26)

A. The balanced equation

B. Equation molar and mass relationships

VIII. The Liquid State

(10/26 -11/2)

A. Water and its unique properties

B. Solutions and solubility

C. Contaminants and purification

IX The Gas State (11/2 - 12/6) 4_HW, Final Exam-1, Lab Exam-1

A. Comparison to solid, liquid states: particle density

B. Effects of temperature and pressure on volume

C. The atmosphere and atmospheric pressure

D. Modeling the gaseous state

X. Special Topics

A. Traditional Knowledge of Chemistry

B. Lab techniques: use of flasks, balances and other classroom

C. appropriate activities

D. Other special topics selected by instructor as relevant

DISCLAIMER: This syllabus is designed to evolve and change throughout the semester based on class progress and interests. You will be notified of any changes as they occur.