

**CHEM 2310 - Introduction to Quantitative Analysis**  
**3 Credit Hours**

**Course Description:**

This course is designed provide an introduction to analytical chemistry primarily for those who intend to pursue a career in teaching high school science, or who need to establish certification for teaching chemistry in high school. Laboratory procedures, sample calculations, statistical analysis of experimental data obtained using virtual laboratory exercises will be included.

**Course Outcomes:**

The goals are:

1. To gain a strong background in the chemical principles important in analytical chemistry

and acquire factual knowledge about current techniques used in chemical analysis.

2. To learn to solve analytical problems in a quantitative manner and evaluate the

accuracy and precision of experimental data thus giving yielding a greater

understanding of the different types of the chemical analysis used in the chemical

industry and environmental studies.

By the end of the semester the student should be able to:

- Describe the analytical process

- Solve chemical equilibrium problems

- Evaluate the uncertainty of experimental data using statistics

- Apply the systematic treatment of equilibrium to a variety of chemical reactions such as



acid-base, redox, and metal complexation

- Define the responsibilities and roles of analytical chemists in society

- Disseminate what they have learned to students and the general public enhancing their

#### Prerequisites and Corequisites:

CHEM 1110 and CHEM 1120

position as a member of society

#### Course Topics:

Students will be introduced to a broad range of topics in modern chemical analysis with emphasis on interesting or timely examples. Such topics might include applications of analytical chemistry in archaeology, nanotechnology, and forensic science.

The course is divided into 6 modules. Each subsequent unit is dependent on the previous units. These are:

1. Analytical Processes and Chemical Measurements
2. Statistical Treatment of Experimental Data
3. Acid Base Equilibrium and Buffer Solutions
4. Polyprotic Acid/Base Equilibrium & EDTA Titration
5. Electrochemistry and Redox Reactions
6. Fundamentals of Spectrochemical Analysis

#### Specific Course Requirements:

To succeed in this course the student must be curious, self-motivated, and well organized. The student must be computer-literate having the abilities to access and browse the web, to use word processing software, use a spreadsheet for graphing and data analysis, and to send and receive attachments via email.

### Required Textbooks:

Please visit the [Virtual Bookstore](#) to obtain textbook information for this course. Move your cursor over the "Books" link in the navigation bar and select "Textbooks & Course Materials." Select your Program, Term, Department, and Course; then select "Submit."

### Supplementary Materials:

Student website available from the publisher. Homework assignments are on-line at WebAssign.

### Web Resources:

- [Citation Styles Online](#)

### Hardware and Software Requirements:

Minimum hardware requirements can be found [here](#).

Minimum software requirements can be found [here](#).

### Common applications you might need:

To read a PDF file download the latest version of [Adobe Reader here](#)

Don't have Microsoft Word? Explore an alternative [OpenOffice here](#)

Accessing a PowerPoint file? Download the [PowerPoint Viewer here](#)

### Web Resources:

Purdue [OWL Online Writing Lab](#) (for APA, MLA, or Chicago style)

The Writing Center [Online Writer's Handbook](#)

#### Student Resources:

- Technical support information can be found on the [TN eCampus Help Desk](#) page.
- Smarthinking virtual tutoring is available **FREE** of charge. to access Smarthinking, visit the course homepage and select Smarthinking under Course Resources. You also view [sample sessions](#) to see what Smarthinking offers and how it works.
- Information on other student issues or concerns can be located on the [TN eCampus Student Resources](#) page.

#### Instructor Information:

Please see "Instructor Information" in the Getting Started Module for instructor contact information, virtual office hours, and other communication information. You can expect to receive a response from the instructor within 24-48 hours unless notified of extenuating circumstances.

#### Testing Procedures:

Tests are required for each module for a total of five (5) tests. They may be taken only during a specified time period. Results, with feedback, will be available immediately to both student and instructor.

One (1) proctored final exam completes the testing process. The student is responsible for selecting and obtaining an acceptable proctor. Instructions for this procedure are found at: <http://www.tnecampus.info/steps-obtaining-proctor>

#### Grading Procedures:

A student's grade is determined based on his/her numerical average achieved through completion of: homework and class participation (discussion forum usage), module tests, special projects, and final examination. Levels of achievement and weighting for each of these elements is outlined below.

#### Grading Scale:

Numerical Range	Letter Grade
90-100	A
80-89	B
70-79	C
60-69	D
Below 60	F

Grades are assigned in conformity with a standard college grading scale listed above. The numerical grade is computed from a weighted average of the following items with the indicated weights. In cases where a student has demonstrated a significant level of improvement, the weight of the final exam may be increased to reflect the then-present level of mastery.

Item	Weight (%)
Homework and Class Participation	20
Special Projects	10
Module Tests (5)	40
Final Exam	30
Total	100

### Assignments and Projects:

The student should plan on completing one module every two weeks in the order shown in course content. Assignments for this course will consist of a homework set for each module, five tests, three special projects, and one final exam. The times at which the homework assignments and module tests can be taken is shown in the course calendar.

### Class Participation:

Each student is expected to participate fully in the class discussion bulletin board. This participation is of two kinds: sending and responding to pleas for help from fellow students and responding to the instructor-posted Discussion Questions. The instructor will post discussion questions unannounced. It is the student's responsibility to check the bulletin board daily for open threads and announcements. Each student is required to respond, in a thoughtful manner, to each discussion question as well as to respond to the comment of at least one fellow student on that same question. After a suitable time the discussion will be ended by the instructor and student responses noted and graded. Every comment must observe proper netiquette. Every comment must be labeled with the students name to permit proper

evaluation.

Last but not least, learn to email the instructor regularly with questions. He or she thrives on them.

### Late Policy:

Planning your week is of vital importance. To keep yourself on track plan to do the following: 1) work through a module with its assigned lecture notes, textbook reading, and homework submission and 2) Participate in any posted discussions and/or the chat room. They will be of great help in understanding the material. Once you have completed a module schedule the test for that module. You can't do it all in one afternoon.

### Course Ground Rules:

*The following two statements (1., 2.) were derived from the TBR System-wide Student Rules document, released January 2012:*

RULES OF THE TENNESSEE BOARD OF REGENTS STATE UNIVERSITY AND  
COMMUNITY COLLEGE SYSTEM OF TENNESSEE SYSTEMWIDE STUDENT RULES  
CHAPTER 0240-02-03 STUDENT CONDUCT AND DISCIPLINARY SANCTIONS

[Read the document in its entirety here.](#)

#### **1. Standards of Conduct:**

- Students are required to adhere to the same professional, legal and ethical standards of conduct online as on campus. In addition, students should conform to generally accepted standards of "netiquette" while sending e-mail, posting comments to the discussion board, and while participating in other means of communicating online. Specifically, students should refrain from inappropriate and/or offensive language, comments and actions.

#### **2. [Review the TN eCampus Academic Integrity/Academic Honesty Policy:](#)**

- In their academic activities, students are expected to maintain high standards of honesty and integrity. Academic dishonesty is prohibited.

Such conduct includes, but is not limited to:

- an attempt by one or more students to use unauthorized information in the taking of an exam
- to submit as one's own work, themes, reports, drawings, laboratory notes, computer programs, or other products prepared by another person,
- or to knowingly assist another student in obtaining or using unauthorized materials.

Plagiarism, cheating, and other forms of academic dishonesty are prohibited.

Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are subject to disciplinary action through the regular procedures of the student's home institution. Refer to the student handbook provided by your home institution to review the student conduct policy.

In addition to other possible disciplinary sanctions that may be imposed, the instructor has the authority to assign an "F" or zero for an activity or to assign an "F" for the course.

#### **Other Course Rules:**

Students are expected to:

- Participate in all aspects of the course
- Communicate with other students
- Learn how to navigate in Brightspace
- Keep abreast of course announcements
- Use the assigned course management (Brightspace) email address rather than a personal email address
- Address technical problems immediately:
  - [Contact Technical Support](#)
  - [View Term Calendar here](#)
- Observe course netiquette at all times.

#### **Guidelines for Communications:**

##### **Email:**

- Always include a subject line.
- Remember without facial expressions some comments may be taken the wrong way. Be careful in wording your emails. Use of emoticons might be helpful in some cases.
- Use standard fonts.
- Do not send large attachments without permission.
- Special formatting such as centering, audio messages, tables, html, etc. should be avoided unless necessary to complete an assignment or other communication.

- Respect the privacy of other class members

### **Discussions:**

- Review the discussion threads thoroughly before entering the discussion. Be a lurker then a discussant.
- Try to maintain threads by using the "Reply" button rather starting a new topic.
- Do not make insulting or inflammatory statements to other members of the discussion group. Be respectful of other's ideas.
- Be patient and read the comments of other group members thoroughly before entering your remarks.
- Be cooperative with group leaders in completing assigned tasks.
- Be positive and constructive in group discussions.
- Respond in a thoughtful and timely manner.

### **Library:**

The [Tennessee Virtual Library](#) is available to all students enrolled in TN eCampus programs and courses. Links to library materials (such as electronic journals, databases, interlibrary loans, digital reserves, dictionaries, encyclopedias, maps, and librarian support) and Internet resources needed by learners to complete online assignments and as background reading will be included within the course modules. To access the Virtual Library, go to the course homepage and select the **Virtual Library** link under Course Resources.

### **Students with Disabilities:**

Qualified students with disabilities will be provided reasonable and necessary academic accommodations if determined eligible by the appropriate disability services staff at their home institution. Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility for specific accommodations from the disability services staff at the home institution. It is the student's responsibility to initiate contact with their home institution's disability services staff and to follow the established procedures for having the accommodation notice sent to the instructor.

### **Syllabus Changes:**

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of



such changes both by individual email communication and posting both notification and nature of change(s) on the course bulletin board.

#### Disclaimer

The information contained in this syllabus is for general information purposes only. While we endeavor to keep this information up-to-date and accurate, there may be some discrepancies between this syllabus and the one found in your online course. The syllabus of record is the one found in your online course. Please make sure you read the syllabus in your course at the beginning of the semester. Questions regarding course content should be directed to your instructor.