

**LIFE AND PHYSICAL SCIENCES**  
**Student Learning Outcome Alignment Form**

**Course Prefix/Number: CHEM 1311**

**Course Title: General Chemistry I**

Core Objective	Course SLO	General Learning Activities	Assessment
Critical Thinking Skills	(SLO #19) Interpret laboratory results and experimental data, and reach logical conclusions.	<p>Materials</p> <p>8-Beral pipettes (small)</p> <p>Stirrers- 1 dozen simple wooden tooth picks</p> <p>1-24 Well-plate</p> <p>Chemicals</p> <p>6-capped vials (labeled A, B, C, D, E, and F), 5 mL of solution</p> <p>Deionized Water</p> <p>B 1% Soluble starch</p> <p>1 M Sodium thiosulfate (<math>\text{Na}_2\text{S}_2\text{O}_3</math>)</p> <p>0.2 M Potassium iodide (KI)</p> <p>Deionized water</p> <p>3 % Hydrogen peroxide</p> <p>Students are not told the contents of the vials. Students are broken into groups of three to four and assigned a task of deciding how to combine the chemicals from the six vials to obtain the colors, yellow-blue-clear, in that order. Each group must develop a detailed plan before they can start the process. The plan must be in writing and available to the teacher and the class. After the plan is developed the group may test it using the chemicals from the vials using, the dropper plate, pipettes, and stirrers. If the plan works, the group produces a report and prepares a presentation. If the</p>	Grade. <a href="#">See attached rubric</a>

		<p>plan fails, adjustments are necessary to produce a workable plan.</p> <p>The chemistry of the color reactions are explored during lecture as the topics arise and the students have visual recollection.</p>	
Communication Skills	(SLO #19) Interpret laboratory results and experimental data, and reach logical conclusions.	<p>Materials</p> <p>8-Beral pipettes (small)</p> <p>Stirrers- 1 dozen simple wooden tooth picks</p> <p>1-24 Well-plate</p> <p>Chemicals</p> <p>6-capped vials (labeled A, B, C, D, E, and F), 5 mL of solution</p> <p>Deionized Water</p> <p>B 1% Soluble starch</p> <p>1 M Sodium thiosulfate (<math>\text{BaS}_2\text{O}_3</math>)</p> <p>0.2 M Potassium iodide (KI)</p> <p>Deionized water</p> <p>3 % Hydrogen peroxide</p> <p>Students are not told the contents of the vials. Students are broken into groups of three to four and assigned a task of deciding how to combine the chemicals from the six vials to obtain the colors, yellow-blue-clear, in that order. Each group must develop a detailed plan before they can start the process. The plan must be in writing and available to the teacher and the class. After the plan is developed the group may test it using the chemicals from the vials using, the dropper plate, pipettes, and stirrers. If the plan works, the group produces a report and prepares a presentation. If the plan fails, adjustments are necessary to produce a workable plan.</p>	Grade. <a href="#">See attached rubric</a>

		The chemistry of the color reactions are explored during lecture as the topics arise and the students have visual recollection.	
Empirical & Quantitative Skills	(SLO #19) Interpret laboratory results and experimental data, and reach logical conclusions.	<p>Materials</p> <p>8-Beral pipettes (small)</p> <p>Stirrers- 1 dozen simple wooden tooth picks</p> <p>1-24 Well-plate</p> <p>Chemicals</p> <p>6-capped vials (labeled A, B, C, D, E, and F), 5 mL of solution</p> <p>Deionized Water</p> <p>B 1% Soluble starch</p> <p>1 M Sodium thiosulfate (<math>\text{BaS}_2\text{O}_3</math>)</p> <p>0.2 M Potassium iodide (KI)</p> <p>Deionized water</p> <p>3 % Hydrogen peroxide</p> <p>Students are not told the contents of the vials. Students are broken into groups of three to four and assigned a task of deciding how to combine the chemicals from the six vials to obtain the colors, yellow-blue-clear, in that order. Each group must develop a detailed plan before they can start the process. The plan must be in writing and available to the teacher and the class. After the plan is developed the group may test it using the chemicals from the vials using, the dropper plate, pipettes, and stirrers. If the plan works, the group produces a report and prepares a presentation. If the plan fails, adjustments are necessary to produce a workable plan.</p> <p>The chemistry of the color reactions are explored during lecture as the topics arise and the students have visual recollection.</p>	Grade. <a href="#">See attached rubric</a>

Teamwork	(SLO #19) Interpret laboratory results and experimental data, and reach logical conclusions.	<p>Materials</p> <p>8-Beral pipettes (small)</p> <p>Stirrers- 1 dozen simple wooden tooth picks</p> <p>1-24 Well-plate</p> <p>Chemicals</p> <p>6-capped vials (labeled A, B, C, D, E, and F), 5 mL of solution</p> <p>Deionized Water</p> <p>B 1% Soluble starch</p> <p>1 M Sodium thiosulfate (<math>\text{BaS}_2\text{O}_3</math>)</p> <p>0.2 M Potassium iodide (KI)</p> <p>Deionized water</p> <p>3 % Hydrogen peroxide</p> <p>Students are not told the contents of the vials. Students are broken into groups of three to four and assigned a task of deciding how to combine the chemicals from the six vials to obtain the colors, yellow-blue-clear, in that order. Each group must develop a detailed plan before they can start the process. The plan must be in writing and available to the teacher and the class. After the plan is developed the group may test it using the chemicals from the vials using, the dropper plate, pipettes, and stirrers. If the plan works, the group produces a report and prepares a presentation. If the plan fails, adjustments are necessary to produce a workable plan.</p> <p>The chemistry of the color reactions are explored during lecture as the topics arise and the students have visual recollection.</p>	Grade. <a href="#">See attached rubric</a>

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# CRITICAL THINKING VALUE RUBRIC

Adapted for Texarkana College from the AAC&U Critical Thinking VALUE Rubric

## Definition

Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.

	Does Not Meet Any Expectations 1	Meets Few Expectations 2	Meets Expectations 3	Exceeds Some Expectations 4	Exceeds All Expectations 5
Explanation of Issues	Did not state issue.	Issue is stated without clarification or description.	Issue is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined and/or backgrounds unknown.	Issue is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.
Evidence	Does not identify the basic components of an issue	Information is taken from sources without any interpretation. Viewpoints of experts are taken as fact, without question	Information is taken from sources with some interpretation but not enough to develop a coherent analysis or synthesis.	Information is taken from sources with enough interpretation to develop a coherent analysis or synthesis.	Information is taken from sources with enough interpretation to develop a comprehensive analysis or synthesis.
Influence of Context and Assumptions	Did not show awareness of the issue.	Show an emerging awareness of present assumptions.	Questions some assumptions. Identifies relevant information when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Thoroughly analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.
Student's Position	Takes no position on issue	Specific position is stated but is simplistic and obvious.	Specific position acknowledges different sides of an issue.	Specific position takes into account the complexities of an issue. Others' points of view are acknowledged within position.	Specific position is imaginative. Limits of position acknowledged. Other points of view are synthesized.

Conclusions and Related Outcomes	Does not use previously learned information in new situations.	Conclusion is inconsistently tied to some of the information discussed; related outcomes are oversimplified.	Conclusion is logically tied to information; some related outcomes are identified.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes are identified clearly	Conclusions and related outcomes are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order
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# Communication RUBRIC

Adapted for Texarkana College from the AAC&U Critical Thinking VALUE Rubric and Making Learning Real

## Definition

Written communication is the development and expression of ideas in writing.

Oral Communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors.

Visual Communication is the use of images to persuade, entertain, inform, and enlighten an observing audience of products, ideas, and messages.

	<b>Does Not Meet Any Expectations</b> <b>1</b>	<b>Meets Few Expectations</b> <b>2</b>	<b>Meets Expectations</b> <b>3</b>	<b>Exceeds Some Expectations</b> <b>4</b>	<b>Exceeds All Expectations</b> <b>5</b>
<b>Quality of Information and Organization</b>	Presentation lacks main points and related details. Information lacks connection to the presentation topic. Information is not organized.	Main points are not clear and lack significant detail. Some information is linked to the presentation topic. Information is loosely organized.	Main points are somewhat clear but could use more detail. Most information is linked to the presentation topic. Information is organized.	Main points are clear and detailed. Information is linked to presentation topic. Information is well organized.	Main points are very clear and very detailed. Information is directly linked to presentation topic. Information is very organized.
<b>Nonverbal Communication</b>	Speaker appears very uneasy and insecure. Speaker faces away from the audience or makes no eye contact. Speaker appears disengaged from the audience. Speaker uses few body motions or gestures or has gestures or movements that distract the audience.	Speaker appears uneasy and somewhat insecure. Speaker rarely faces the audience or makes eye contact. Speaker rarely appears to be engaging with the audience. Speaker uses few body motions or has gestures or movements that distract the audience..	Speaker appears generally at ease and confident. Speaker sometimes faces the audience and maintains eye contact. Speaker sometimes appears to be engaging with the audience. Speaker's body motions and gestures neither support nor detract from presentation.	Speaker appears fairly comfortable and confident. Speaker generally faces the audience and maintains good eye contact. Speaker generally appears to be engaging with the audience. Speaker uses body motions and gestures well.	Speaker appears very comfortable and confident. Speaker consistently faces the audience and maintains good eye contact. Speaker consistently appears to be engaging with the audience. Speaker uses body motions and gestures very effectively.
<b>Quality of Verbal Communication</b>	Speaker's voice is consistently too weak or too strong. Speaker fails to use inflections to emphasize key points and create interest or often uses inflections	Speaker's voice is frequently too weak or too strong. Speaker rarely uses inflections to emphasize key points and create interest or speaker sometimes uses	Speaker's voice is generally steady strong and clear. Speaker sometimes uses inflections to emphasize key points and create	Speaker's voice is steady, strong, and clear. Speaker often uses inflections to emphasize key points and create interest. Speaker's talking pace is mostly appropriate.	Speaker's voice is very confident, steady, strong, and clear. Speaker consistently uses inflections to emphasize key points or to create interest. Speaker's talking



	inappropriately. Speaker's talking paces is consistently too slow or too fast.	inflections inappropriately. Speaker's talking pace is often too slow or too fast.	interest. Speaker's talking pace is appropriate.		pace is consistently appropriate.
<b>Visual Tools</b>	Visual aids demonstrate no creativity or clarity and are often difficult to read. Presentation is weakened by the visual tools.	Visual aids have limited creativity or clarity or are sometimes difficult to read. Presentation is not enhanced by the visual tools.	Visual aids are reasonably creative, clear, and easy to read. Presentation is sometimes enhanced by the visual tools.	Visual aids are usually creative, clear, and easy to read. Presentation is often enhanced by the visual tools.	Visual aids are very creative, clear, and easy to read. Presentation is consistently enhanced by the visual tools.
<b>Appropriate Use of Vocabulary</b>	Few or no terms are included in the presentation. May or may not be used appropriately. Lacks context.	Several terms are included in the presentation. May or may not be used appropriately. May lack context.	Most terms are included in the presentation. Generally used appropriately. Generally used in appropriate context.	All terms are included in the presentation. Used effectively. Used in context.	All terms are included in the presentation. Used in unique and creative ways. Used in context
<b>Precision and Detail in Documents Produced</b>	Written documents have numerous errors and lack detail. Little care taken in the production.	Documents may have some errors and show some detail. Some care has been taken in production.	Evident that written documents are correct and show a general attention to detail and accuracy. General care has been taken in production.	Clearly evident that written documents are correct, detailed and accurate. Care has been taken in production.	Documents are clear, well-constructed, accurate, and show attention to detail. Extra care has been taken in the production of written documents.
<b>Overall Presentational Effectiveness</b>	The presentation was weak and not effective.	The presentation was average and somewhat effective.	The presentation was good and effective.	The presentation was very good and effective.	The presentation was exceptional and extremely effective.

# Empirical and Quantitative Skills RUBRIC

Adapted for Texarkana College from the AAC&U Critical Thinking VALUE Rubric

## Definition

The ability to formulate an inquiry that is scientific or mathematical in nature, and then manipulate and analyze numerical data and/or follow an investigative process using empirical and/or quantitative reasoning to satisfy the inquiry and create informed conclusions.

	<b>Does Not Meet Any Expectations</b> <b>1</b>	<b>Meets Few Expectations</b> <b>2</b>	<b>Meets Expectations</b> <b>3</b>	<b>Exceeds Some Expectations</b> <b>4</b>	<b>Exceeds All Expectations</b> <b>5</b>
<b>Identification</b>	The purpose, components, and variables of the investigation/project are not identified.	The purpose, components, and variables of the investigation/project are somewhat identified.	The purpose, components, and variables of the investigation/project are mostly identified	The purpose, components, and variables of the investigation/project are clearly identified..	The purpose, components, and variables of the investigation/project are clearly identified.
<b>Assimilation</b>	The information that is required for an analysis of all investigative components is not evident. If applicable, values are incorrectly translated into variables and no necessary formulas are present.	The information that is required for an analysis of all investigative components is somewhat evident. If applicable, values are incorrectly translated into variables and some necessary formulas are present.	The information that is required for an analysis of all investigative components is mostly evident. If applicable, some values are correctly translated into variables and most necessary formulas are present.	The information that is required for an analysis of all investigative components is evident. If applicable, most values are correctly translated into variables and all necessary formulas are present.	The information that is required for an analysis of all investigative components is clearly evident. If applicable, values are correctly translated into variables and all necessary formulas are present.
<b>Analysis</b>	Most investigative or quantitative components are not scrutinized. The steps followed are illogical and/or irrelevant to the desired result. The proper tools/ technology were not used and/or integrated into the final product. Any notation is not consistent and not defined.	Some investigative or quantitative components are scrutinized. Some steps followed are somewhat logical and relevant to the desired result. The proper tools/ technology were somewhat used and not integrated into the final product. Any notation is somewhat consistent but not defined.	All investigative or quantitative components are somewhat scrutinized. The steps followed are mostly logical and relevant to the desired result. The proper tools/ technology were mostly used and somewhat integrated into the final product. Any notation is mostly consistent and defined.	All investigative or quantitative components are scrutinized. The steps followed are logical and relevant to the desired result. The proper tools/ technology were used and mostly integrated into the final product. Any notation is consistent and well defined.	All investigative or quantitative components are methodically scrutinized. The steps followed are logical and relevant to the desired result. The proper tools/ technology were used and well integrated into the final product. Any notation is consistent and well defined.

<b>Presentation</b>	<p>A summary of the analysis is either inadequately presented or not presented at all. The presented information is mostly incorrect, and/or of poor quality, and/or the terminology/figures are inaccurate and/or hard to understand. Few or no visual representations of evidence are acceptably scaled/ represent the analysis findings.</p>	<p>A partial summary of the analysis is presented. The presented information is somewhat correct, of adequate quality, and the terminology/figures are somewhat accurate and relatively easy to understand. Some visual representations of evidence are acceptably scaled and represent the analysis findings.</p>	<p>A summary of the analysis is presented. The presented information is mostly correct, of good quality, and the terminology/figures are mostly accurate and easy to understand. Most visual representations of evidence are acceptably scaled and represent the analysis findings.</p>	<p>A good summary of the analysis is presented. The presented information is correct, of good quality, and the terminology/figures are accurate and easy to understand. Most visual representations of evidence are well-scaled and/or well represent the analysis findings..</p>	<p>A concise summary of the analysis is presented. The presented information is correct, of high quality, and the terminology/figures are accurate and easy to understand. All visual representations of evidence are well-scaled and well represent the analysis findings.</p>
<b>Application</b>	<p>The integration does not include all steps of the investigation and does not lead to an accurate, nor complete conclusion that relates to the initial investigative argument.</p>	<p>The integration of most steps of the investigation lead to a somewhat accurate, partially complete conclusion that is relative to the initial investigative statement.</p>	<p>The coherent integration of most steps of the investigation lead to an accurate, mostly complete, acceptable conclusion that is relative to the initial investigative statement.</p>	<p>The coherent integration of all steps of the investigation lead to an accurate, mostly complete, relevant conclusion that is relative to the initial investigative statement.</p>	<p>The coherent integration of all steps of the investigation lead to an accurate, complete, relevant conclusion that is relative to the initial investigative statement.</p>

# Teamwork Skills RUBRIC

Adapted for Texarkana College from the AAC&U Critical Thinking VALUE Rubric

## Definition

Teamwork is behaviors under the control of individual team members, their manner of interacting with others on team, and the quantity and quality of contributions they make to team discussions.

	Does Not Meet Any Expectations 1	Meets Few Expectations 2	Meets Expectations 3	Exceeds Some Expectations 4	Exceeds All Expectations 5
Contributes to Team Meetings	Does not collect any relevant information; no useful suggestions to address team's needs;	Shares ideas but does not advance the work of the group.	Offers new suggestions to advance the work of the group	Offers alternative solutions or courses of action that build on the ideas of others.	Helps the group move forward by articulating the merits of alternative ideas or proposals
Facilitates the Contributions of Team Members	Often argues with team mates; doesn't let anyone else talk; occasional personal attacks and "put-downs"; wants to have things done his way and does not listen to alternate approaches;	Engages group by taking turns and listening to others without interrupting.	Engages group by restating the views of other members and/or asking questions for clarification.	Engages group by constructively building upon or synthesizing the contributions of others..	Engages group by both constructively building upon and synthesizing the contributions of others as well as noticing when someone is not participating and inviting him/her to engage.
Individual Contributions Outside of Team Meetings	Completes no assigned tasks outside of team meetings.	Completes some assigned tasks by deadline.	Completes all assigned tasks by deadline; work accomplished advances the project.	Completes all assigned tasks by deadline; work accomplished and is thorough, comprehensive, and advances the project.	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project. Proactively helps other team members complete their assigned tasks to a similar level of excellence.
Fosters Constructive Team Climate	Is argumentative and does not work with the team.	Supports a constructive group climate by treating other members respectfully.	Supports a constructive group climate by treating other	Supports a constructive group climate by treating other	Supports a constructive group climate by treating other

			members respectfully and conveying a positive attitude about the group and its work.	members respectfully, conveying a positive attitude about the group and its work, and motivating other group members.	members respectfully, conveying a positive attitude about the group and its work, motivating other group members, and providing assistance to group members.
Responds to Conflict	Is not present enough to engage in conflict.	Passively accepts alternate viewpoints/ideas/opinions.	Redirects focus toward common ground, toward task at hand (away from conflict)..	Identifies and acknowledges conflict and stays engaged with it.	Addresses conflict directly and helps to manage/resolve it in a way that strengthens overall group cohesiveness.

## Student Learning Outcomes (SLO)

### CHEM 1312

1. State the characteristics of liquids and solids, including phase diagrams and spectrometry.
2. Articulate the importance of intermolecular interactions and predict trends in physical properties.
3. Identify the characteristics of acids, bases, and salts, and solve problems based on their quantitative relationships.
4. Identify and balance oxidation-reduction equations, and solve redox titration problems.
5. Determine the rate of a reaction and its dependence on concentration, time, and temperature.
6. Apply the principles of equilibrium to aqueous systems using LeChatelier's Principle to predict the effects of concentration, pressure, and temperature changes on equilibrium mixtures.
7. Analyze and perform calculations with the thermodynamic functions, enthalpy, entropy, and free energy.
8. Discuss the construction and operation of galvanic and electrolytic electrochemical cells, and determine standard and non-standard cell potentials.
9. Define nuclear decay processes.
10. Describe basic principles of organic chemistry and descriptive inorganic chemistry

# SYLLABUS

**Syllabus:** General Chemistry I

**Course Number:** Chemistry 1411

**Semester & Year:** Fall 2012

Instructors Information:	
Mike Buttram, Professor	Patricia Harman, Professor
Office Number: Chemistry Building Room 221	Office Number: Chemistry Building Room 225
Phone Number: 903-838-4541 Ext 3280	Phone Number: 903-838-4541 Ext 3392
Email Address: <a href="mailto:mike.buttram@texarkanacollege.edu">mike.buttram@texarkanacollege.edu</a>	Email Address: <a href="mailto:patricia.harman@texarkanacollege.edu">patricia.harman@texarkanacollege.edu</a>
Web Page: <a href="https://campus.texarkanacollege.edu/">https://campus.texarkanacollege.edu/</a>	Web Page: <a href="https://campus.texarkanacollege.edu/">https://campus.texarkanacollege.edu/</a>
Office Hours: MW 9:30-11:00 and 5:30-6:00 TTR 11:00-12:00	Office Hours: MW 9:30-11:00, TTh 8:00-9:30

Class Schedule:			
Lecture: Chemistry Bldg. Room 224		Laboratory: Chemistry Bldg Room 220	
Chem 1411.01	MW 11:00 am-12:15 pm	Chem 1411.51	M 2:00-4:45 pm
Chem 1411.02	TTh 9:30 am-10:45 am	Chem 1411.52	T 2:00-4:45 pm
		Chem 1411.53	W 2:00-4:45 pm
Chem 1411.03N	MW 6:00 pm-9:00 pm	Laboratory included in lecture schedule	

**Course Description:** Chemistry 1411 covers the fundamental facts, laws, principles, theories, and concepts of chemistry necessary for further work in science or science-related subjects. The course stresses chemistry basics, stoichiometry, atomic structure, periodic properties of matter, chemical bonding, molecular geometry of organic and inorganic molecules, and the states of matter. Chemistry 1411 involves lecture sessions and laboratory sessions. Students who enroll in Chemistry 1411 enroll in a lecture section and a laboratory section (For night classes the two are combined). The course is taught by two professors, and both lecture and laboratory are integral parts of the course that attempt to cover related material in the same time frame. The course has a college credit of 4 hours.

**Prerequisites:** Students are expected to have completed either pre-calculus in high school or college algebra. Those that do not meet these requirements should be concurrently enrolled in Chemical Calculations (Chemistry 1205). It is helpful to have had one or more years of high school chemistry or an introductory course in college chemistry. Students who cannot meet these requirements need the permission of the professor to enroll.

**Required Textbooks:** The Chemistry 1411 textbook is Chemistry, 4<sup>th</sup> edition by McMurry and Fay. The ISBN number is 0-13-140208-0. This book can be acquired at a reasonable price from the Texarkana College Book Store or online. A website with no shipping charges is <http://www.betterworldbooks.com/>. An older or newer version of the text book is acceptable. The problem solution manual is optional. It is available in the college bookstore and online. The ISBN number is 0-13-140214-5. The Chemistry 1411 Laboratory Manual is available in the Texarkana College Book Store or may be downloaded directly from the Chemistry 1411 Moodle Page. All problem assignments and lecture material may be obtained from the Chemistry 1411 Moodle Page.

**Lecture:** Chemistry 1411 lecture meets for 75 minutes twice a week for fourteen weeks and has an extended period for a final examination during the fifteenth week. The format involves typical lecture presentations supported by electronic displays and numerous live chemical demonstrations that support the topics under discussion. The lecture electronic material is available on the campus Moodle Page along with other activities that support many concepts. The grade for the lecture portion of the course is determined from a combination of scores on five written sectional examinations and the a comprehensive final examination. The final examination is a standardized multiple choice test written by the American Chemical Society. The lecture component of the course accounts for sixty percent of the overall course grade (50% for the sectional examinations and 10% for the final examination). Sectional examinations from past years are available on the course Moodle Page.

**Tentative Examination Schedule:**

Examination I	Chapter 1 &, 2	September 11 <sup>th</sup> and 12 <sup>th</sup>
Examination II	Chapters 3 & 4	October 2 <sup>nd</sup> and 3 <sup>rd</sup>
Examination III	Chapter 5 & 6	October 23 <sup>rd</sup> and 24 <sup>th</sup>
Examination IV	Chapter 7	November 14 <sup>th</sup> and 15 <sup>th</sup>
Examination V	Chapter 8 & 9	December 5 <sup>th</sup> and 6 <sup>th</sup>



**Laboratory:** Chemistry 1411 laboratory consists of fourteen three hour laboratory periods that introduce the student to basic chemistry laboratory concepts, techniques, and calculations. Safety practices are covered during the first laboratory, and the safety theme is continued throughout the semester. Students are required to wear safety glasses at all times, wear pants that cover the legs, and have closed toed shoes. The completion of a pre-laboratory assignment is required before a student can take part in the laboratory activities for a given session. The pre-laboratory assignments review the relevant theory and problems solving skills necessary to complete the laboratory assignment. The laboratory grade is based upon the completion of the pre-laboratory assignment and the laboratory work as assigned. The completed laboratory work and pre-laboratory assignment should be turned in at end of the laboratory period. The work will be assigned a numerical grade and returned to the student. Students who do not achieve a score of "60" or better for the laboratory portion will not receive a passing grade in Chemistry 1411.

**Homework:** Students are expected to complete weekly homework assignments. The assignments are available as handouts and can be downloaded from the Moodle page. Each homework assignment is to be completed prior to the subject area examination. The home work will be assigned a grade and the average grade on the homework assignments counts as 10% of the total course grade. It is the student's responsibility to see that their work result is graded and recorded. Home work that is presented for a grade after the area examination will not generally be given any credit.

**Extra Credit Work:** Extra credit for final grade determination can be obtained by completing the computer tutorials in the computer tutorial laboratory (Chemistry Building, Room 218) and by completing the extra credit examinations on the Chemistry 1411 Moodle page with a grade of 90% or better. Completion of each activity allows a maximum value of 5 points to be added to the final course grade.

**Final Course Grade:** The final course grade is determined by combining the lecture, laboratory and homework grade together in the following manner:

Grade Category	Maximum Score
Lecture test Average x 0.5 =	50
Final examination grade x 0.1 =	10
Laboratory average x 0.3 =	30

Homework average x 0.1 =	10
Computer tutorial completion (Maximum 5 pts based on % completion)=	5
Extra Credit Examinations on Moodle Page (Maximum 5 pts based on % completion)=	5
Total Score	110

**Tutoring:** Texarkana College Student Support Services has tutors available to assist chemistry students that need help with the course. They can help with the completion of homework assignments and pre-laboratory assignments. These tutors are typically available in the Chemistry Building. Schedules will be posted.

**Learning Outcomes:** The learning outcomes for Chemistry 1411 are published by the Texas Higher Education Coordinating Board and are available from the Lower-Division Academic Course Guide Manual. The following are included for those that successfully complete the course:

1. Define the fundamental properties of matter.
2. Classify matter, compounds, and chemical reactions.
3. Determine the basic nuclear and electronic structure of atoms.
4. Identify trends in chemical and physical properties of the elements using the Periodic Table.
5. Describe the bonding in and the shape of simple molecules and ions.
6. Solve stoichiometric problems.
7. Write chemical formulas.
8. Write and balance equations.
9. Use the rules of nomenclature to name chemical compounds.
10. Define the types and characteristics of chemical reactions.
11. Use the gas laws and basics of the Kinetic Molecular Theory to solve gas problems.
12. Determine the role of energy in physical changes and chemical reactions.
13. Convert units of measure and demonstrate dimensional analysis skills.

Specific laboratory objectives required by the Texas Higher Education Coordinating Board and available from the Lower-Division Academic Course Guide Manual are:

1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
2. Demonstrate safe and proper handling of laboratory equipment and chemicals.
3. Conduct basic laboratory experiments with proper laboratory techniques.
4. Make careful and accurate experimental observations.
5. Relate physical observations and measurements to theoretical principles.
6. Interpret laboratory results and experimental data, and reach logical conclusions.
7. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
8. Design fundamental experiments involving principles of chemistry.
9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

### **GENERAL COURSE POLICIES**

**Attendance Policy:** You are not required to attend lecture sessions. Success in college level courses is often closely correlated with classroom attendance and participation. The role will be called and a list of those absent maintained. If you make a grade of "F" for whatever reason the last day you attended class based on the class role will be recorded on the final grade sheet. This may impact your scholarships and future funding. It is possible that you will be asked to return money based on this date. Attendance and completion of laboratory assignments is mandatory. Students who miss more than three laboratories will be dropped from the class unless other arrangements are made with the laboratory instructor. Students who do not achieve a score of "D" or better for the laboratory portion will not receive a passing grade in Chemistry 1411.

**Classroom Behavior:** In general, lectures and laboratories are conducted in a rather open fashion with adequate opportunity for students to interact with their instructors and with each other about chemistry. Excessive talking between students or other behavior that becomes a distraction to the instructor or class members will result in the student(s) being asked to leave the class. Please mute any electronic devices before attending course lectures. General behavior for students on campus is reviewed in the Texarkana College Catalogue and the Texarkana College-Student Handbook (<https://www.texarkanacollege.edu/>)

**Missed Examinations:** If you know in advance that you are going to miss an examination it is best to arrange with the instructor to take the examination early. If you miss an examination for reasons beyond your control, you should contact the instructor as soon after as feasible to make arrangements to take the examination. Examinations are typically graded promptly and returned. It is best to take a missed examination prior to the original being returned to the class for review. In cases of extended illness or disaster, accommodations can usually be made.

**Missed Laboratory:** Students who know they will miss laboratory should meet with the instructor to see if attending a laboratory on a different day of the week is feasible. Instructors are generally willing to help students who notify them promptly of their attendance problems and keep them up to date. Students who miss more than three laboratory sessions will be dropped from the course unless they have made other arrangements with the instructor.

**Incomplete Grade Policy:** Incompletes can be given if you complete 75% of the course work with at least a 70% average. Students who want an incomplete grade should meet with the instructor and make a request for the grade and have a plan for completing the required work.

**Withdrawal Policy:** If you wish to drop the class, please do so yourself. The instructor will not be responsible, unless you make a specific request prior to the drop deadline. The drop deadline for each semester is can be found in the Texarkana College Catalogue (<https://www.texarkanacollege.edu/>). After the drop deadline the student that fails to complete the class with a satisfactory grade will receive a grade of "F". The student's final attendance date will be reported with the grade of "F".

**Testing Center Policy:** During the semester you may be asked to take examinations in the Texarkana College Assessment and Testing Center located in Room 11 of the Business and Computer Technology Building. The hours of operation, policies and procedures for the testing center can be found on the Texarkana College Web Page at <https://www.texarkanacollege.edu/>. The policies of the Texarkana College Assessment and Testing Center must be studied and closely followed.

**Student Services:** Student Services is located on the first floor of the Administration Building and offers many services to TC students. These include campus housing, student handbook, awards and recognition, student insurance, and scholarships. The web address is <https://www.texarkanacollege.edu/>.

**Student Support Services:** Student Support Services helps students by offering career information, tutoring, study skills, and college transfer information. Student Support Services is located in Room 106 of the Career Education Center. The Web page for Student Support Services can be found at <https://www.texarkanacollege.edu/>.

**Academic Integrity Statement:** Scholastic dishonesty, involving but not limited to cheating on a test, plagiarism, collusion, or falsification of records will make the student liable for disciplinary action after being investigated by the Dean of Students. Proven violations of this nature will result in the student being dropped from the class with an "F". This policy applies campus wide, including the TC Testing Center, as well as off-campus classrooms or lab sites. For more information students should refer to TC Student Handbook.

**Disability Act Statement:** Texarkana College complies with all provisions of the Americans with Disabilities Act and makes reasonable accommodations upon request. Please contact Larry Andrews at 903.823.3283, or go by the Recruitment, Advisement, and Retention Department located in the Administration building for personal assistance.

If you have an accommodation letter from their office indicating that you have a disability which requires academic accommodations, present it the instructor so we can discuss the accommodations that you might need for this class. It is best to request these changes at the beginning if not before the start of class so there is ample time to make the accommodations. See Texarkana College Catalogue at: <https://www.texarkanacollege.edu/>

**Financial Aid:** Attention! Dropping this class may affect your funding in a negative way! If you drop, you could owe money to the college and/or federal government. Please check with the Financial Aid office before making a decision.

# General Chemistry

## Grade Minder

### Chapter Exams

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

### Laboratory Grades

- Lab 1. \_\_\_\_\_
- Lab 2. \_\_\_\_\_
- Lab 3. \_\_\_\_\_
- Lab 4. \_\_\_\_\_
- Lab 5. \_\_\_\_\_
- Lab 6. \_\_\_\_\_
- Lab 8. \_\_\_\_\_
- Lab 9. \_\_\_\_\_
- Lab 10.  
\_\_\_\_\_
- Lab 11.  
\_\_\_\_\_
- Lab 12.  
\_\_\_\_\_
- Lab 13.  
\_\_\_\_\_

### Problem Set

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

If you want to calculate your grade at any time follow this procedure:

Find your chapter examination average x 0.5 \_\_\_\_\_

Find your laboratory write-up average x 0.3 \_\_\_\_\_

Find your problem set average x 0.1 \_\_\_\_\_

Estimate your final exam grade x 0.1 \_\_\_\_\_

Tutorial extra Credit (Maximum 5 points) \_\_\_\_\_

Moodle page Examinations extra credit (Maximum 5 points) \_\_\_\_\_

Find the sum of previous six to determine your numerical score for General Chemistry \_\_\_\_\_

A numerical score of 90 or above equates with an "A", 80 or above with a "B", 70 or above with a "C", 60 or above a "D", and grades below 60 equate with a grade of "F". Students who do not have a numerical score of "60" or better for the laboratory portion of the course will not receive a passing grade for the course

Chemistry 1311  
Laboratory Problem

**Materials**

8-Beral pipettes (small)  
Stirrers- 1 dozen simple wooden tooth picks  
1-24 Well-plate

**Chemicals**

6-capped vials (labeled A, B, C, D, E, and F), 5 mL of solution

- A. Deionized Water
- B. B 1% Soluble starch
- C. 1 M Sodium thiosulfate ( $\text{BaS}_2\text{O}_3$ )
- D. 0.2 M Potassium iodide (KI)
- E. Deionized water
- F. 3 % Hydrogen peroxide

Students are not told the contents of the vials. Students are broken into groups of three to four and assigned a task of deciding how to combine the chemicals from the six vials to obtain the colors, yellow-blue-clear, in that order. Each group must develop a detailed plan before they can start the process. The plan must be in writing and available to the teacher and the class. After the plan is developed the group may test it using the chemicals from the vials using, the dropper plate, pipettes, and stirrers. If the plan works, the group produces a report and prepares a presentation. If the plan fails, adjustments are necessary to produce a workable plan.

The chemistry of the color reactions are explored during lecture as the topics arise and the students have visual recollection.