CHEM 101 – General, Organic, and Biochemistry for the Health Sciences

Course Syllabus, Fall 2025 (Sections 21-24)

Instructor: Dr. David K. Bwambok

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Student (Office) Hours (FB 418) – Tuesday 11:00 am – 12:00 pm, Wednesday 11.00 am – 12.00 pm, Friday 10:00 am – 11:00 pm, and by appointment

Lectures: Tuesday and Thursday 12:30 pm-1:45 pm (FB 101)

Problem Sessions: Friday 1:00 pm - 1:50 pm (FB 101)

Supplemental Instruction (SI) Sessions: To be announced on the first week of class

Course Website: Canvas (https://bsu.instructure.com)

Required Texts/Registrations - Course Bundle that contains:

- eBook (*General, Organic, and Biochemistry, 3rd Ed.*; Denise Guinn; W.H. Freeman and Company; 2019)
- *Achieve* online homework system
- iClicker Cloud

*This bundle is available through the Ball State University Book Store. Please contact your instructor if you have any issues.

Required Materials

Bundle described above
scientific calculator (TI−30X series required)
smart phone capable of running iClicker Cloud app
splash-proof safety goggles
lab coat (must be long-sleeved and cover the torso from the shoulder to the knee)

Contacting the Instructor

If you would like to meet with your instructor to discuss course-related issues, please see the instructor during student hours. These are times during the week that the instructor will be in their office and available to discuss course topics. Please note that student hours are open to all students. It is possible that other students will be in the instructor's office during these times. If you are not available during the designated student hours and need to speak with your instructor, please email your instructor or speak with them after class to schedule an appointment.

When emailing your instructor, you should expect a response within a few hours but no later than the following morning. The only exception is over weekends and during breaks when your instructor may not have the opportunity to respond to your email as quickly. If you do not receive a response within 24 hours, please resend your message. To ensure a quick response, please adhere to the suggestions in *Some Tips …when sending email* below. The best way to get in touch with your instructor is by email. However, if you need to speak with your instructor and are in the new Foundational Sciences Building, feel free to stop by your instructor's office. If the door is closed, please knock to see if your instructor is free.

Course Description and Prerequisites

CHEM 101 is an elective in the University Core Curriculum which surveys the complete field of chemistry, focusing on physical, organic, and biochemistry. This course is divided into units beginning with the general principles of physical chemistry, including the structure of the atom, radioactivity, the properties of ionic and covalent compounds, the chemical properties of matter, solution formation and properties, and solution chemistry. Then, the structure and properties of carbon-containing compounds will be investigated to learn about the interactions between the molecules which are important to live cells. The course will finish with an introduction to biochemistry focusing on the study of carbohydrates, lipids, and proteins.

Class Preparation

Students should come to the lecture prepared to learn about that day's material. To help you prepare, a tentative schedule of topics is listed below in this syllabus. Students are expected to read through the ebook sections identified in this schedule prior to the relevant lecture sessions. Much of the lecture material will be presented using PowerPoint. Due to the breadth of material covered in this course, students will not have time to write down all the information contained on the PowerPoint slides during the lecture sessions. To assist with notetaking, the lecture slides will be made available on the course website. Students are recommended to either print a copy of the lecture notes to write on during the lecture session or download the slides to a tablet or laptop and use pen technology to write notes. Taking notes is an essential part of learning chemistry. The cleaner and neater your penmanship, the easier it will be to review your notes after class.

Outline of Course Topics

The following topics will be covered in CHEM 101:

- Matter and Energy
- Units and Measurement
- Significant Figures in Measurements and Calculations
- Dimensional Analysis
- Temperature Scales and Conversions
- Elements and the Structure of the Atom
- Navigating the Periodic Table of the Elements
- Electron Arrangement and Valence Electrons
- Radioisotopes: α decay and β decay
- Half-Life of Radioisotopes
- High-Energy Electromagnetic Radiation
- The Penetrating Power and Biological Effects of Radiation
- Ionic Compounds
- Covalent Compounds
- Writing Lewis Dot Structures of Covalent Compounds
- Three-Dimensional Shapes of Molecules
- Bond Dipoles and Molecular Polarity
- Intermolecular Forces of Attraction in a Compound
- Counting and Weighing Matter: The Mole
- Writing and Balancing Chemical Equations
- Types of Chemical Reactions
- Energy and Chemical Reactions
- Rates of Chemical Reactions
- Chemical Equilibrium
- Changes of State
- Properties of Gases and The Gas Laws
- Gas Mixtures and Partial Pressures
- Types of Mixtures
- Solutions: Dissolving Covalent and Ionic Compounds in a Solvent
- Solution Concentration
- Solution Dosage and Dilution Calculations
- Osmosis and Dialysis
- Acids and Bases; pH
- Acid-Base Neutralization Reactions
- Buffers
- Introduction to Organic Chemistry and Hydrocarbons
- Alkanes and Cycloalkanes
- Writing Condensed and Line Structures of Alkanes
- Alkenes and Alkynes
- Aromatic Hydrocarbons
- Naming Substituted Hydrocarbons
- Introduction to Functional Groups in Organic Chemistry
- Alcohols, Phenols, Thiols, and Ethers
- Amines and Their Chemical Reactivity as Bases
- Introduction to the Carbonyl-Containing Functional Groups
- Aldehydes and Ketones
- Carboxylic Acids, Esters, and Amides
- Oxidation-Reduction Reactions
- Esterification, Thioesterification, and Amidation Reactions
- Hydrolysis Reactions
- Hydration and Dehydration Reactions
- An Overview of Carbohydrates and Their Function
- Stereoisomers
- The Structure of Common Monosaccharides
- The Structure of Complex Carbohydrates
- The Role of Oligosaccharides as Cell Markers
- Fatty Acids
- Triacylglycerols: Energy Storage Lipids
- Membrane Lipids: Phospholipids and Glycolipids
- Cholesterol, Steroids, and Lipoproteins
- Amino Acids
- Peptides
- Protein Structure
- Enzymes and Enzyme Inhibitors

Lectures

Students are expected to be present and on time for class. Students are responsible for actively learning the lecture material presented by the instructor and are expected to participate in all class activities. Learning chemistry requires that you write down the symbology and work while taking notes and solving problems; therefore, you should bring a pen or pencil (or digital equivalent) along with your outlines to every lecture. Having a calculator on hand is a good idea, as several example calculations will be performed during the lecture sessions this semester.

Students are further expected to be courteous and respectful of others in the lecture hall; therefore, any discussions or comments not related to course topics should be taken to the hallway. Discussions over course-related topics should be held at a low volume to refrain from disturbing those around you. In addition, electronic devices not being used to obtain notes should be turned off or silenced and stowed beneath your chair. Students engaging in distracting, disruptive, and/or inappropriate behavior will be asked to leave the lecture hall. Students are welcome to record video and/or take photos during in-class demonstrations.

Problem Sessions

During the Friday meeting each week (except for exam weeks), we will hold a group problem solving session. The instructor will provide the problem set on Canvas, and students will work together (or independently) to solve the problems. The instructor will assist as students work on the problems and will direct the class as a whole to specific ideas or concepts that are relevant to the problems.

Students are expected to attend all problem sessions prepared to work on the problems. This means having access to the provided problems, as well as all materials required to solve the problems (pen/pencil, paper (or digital equivalent), calculator, notes, etc.). The problems provided will be designed to prepare students for the relevant exams, so this opportunity to practice the knowledge gained in the lecture sessions will be essential to students' success.

University Attendance Policy

A student's official course program is regarded as a contract with the university. Because maximum achievement requires, in part, regular and punctual class attendance, students are expected to attend all classes for which they are registered. Faculty will establish attendance policies for their courses and communicate those policies through course syllabi or outlines.

Students who know they must be absent from a class should notify the instructor or departmental office. Courtesy requires that students speak to the instructor and preferably present a signed and dated memo briefly stating the reasons for absence.

Faculty members are responsible for keeping records of the attendance of all students registered in each class. Students are responsible for completing any work they have missed. The faculty member is not required to do extra teaching to help students "catch up."

Instructor's Attendance Policy

Students are expected to attend all lectures and problem sessions this semester. If you cannot attend class due to illness, quarantine, weather, family emergency, or other University-sanctioned reason, please notify your instructor via email. You do not have to include any specific details in said email. If a student is absent for two consecutive class periods without contacting the instructor or if their absences are excessive and thereby endanger their scholastic standing, the instructor reserves the right to report the absences to the Dean of Students in the Division of Student Affairs.

Attendance will be monitored using the iClicker Cloud app running on a smartphone or equivalent device. Students should register for their iClicker Cloud accounts using the link on the course website prior to our first lecture. Be certain to add our class (**CHEM 101 Sections 21-24**) to your course list. Students will receive points for each lecture session attended, registered when a student answers one or more questions via the iClicker Cloud app.

In-Class Activities

In-class activities will be administered to assess student learning during each lecture this semester. Responses will be collected using the iClicker Cloud app. Please be certain to bring this app (via a smartphone or device with internet access) to every lecture. A maximum of 50 points can be earned by answering in-class assignments and uploading problem sets. Students who notify the instructor of their University excused absence will receive their attendance points. Students who do not notify the instructor will receive 0 (zero) attendance points but may still submit their work for a half credit. Late submissions will be accepted for half credit.

Supplemental Instruction (SI) Sessions

Learning chemistry is an active process: you must work on problems to improve and perfect your problem-solving skills. To assist students with learning effective problem-solving skills and with exam preparation, supplemental instruction (SI) sessions are available. The SI Sessions provide students an opportunity to work together in small groups (or independently if they prefer) to solve problems and answer questions. The SI leader will provide guidance on effective learning strategies for success in the course.

Homework Assignments

As a means of self-assessment and to help students prepare for examinations, homework assignments will be given online via the Achieve online homework system. Students are expected to complete these assignments outside of the lecture and problem session times. Working on these problems is a necessary step toward understanding the lecture material and successfully preparing for the assessments. A total of 5-unit homework assignments will be scheduled this semester, each worth 20 points for a maximum score of 100/100. Students can earn up to 22 points for completing each unit homework on Achieve. While the homework is officially out of 100 total points, it is possible to earn up to 10 extra points by completing the homework, for a maximum of 110/100 points. Extra points have been worked in to reduce the pressure of needing to "be perfect" to receive a high homework score and to give students an opportunity to earn some extra credit points.

Students are expected to complete online assignments using the Achieve online homework system. Registration information, as well as access to Achieve is available on the course website. You will have multiple attempts to answer each question in an assignment, as well as unlimited attempts at answering each assignment. Typically, assignments will open 10 days before the due date, and close Saturday morning (at 6 am) on the week of the relevant course material for the unit. For a complete schedule of due dates, please see the home page on Achieve.

Exam Review Classes

To help students prepare for exams, Thursday classes before each exam will be designated as Exam Review days. Attendance is required at these sessions. Attendance will be taken via the iClicker Cloud app; however, students will also be expected to complete in-class activities. Each activity will be scored out of 10 points. A maximum of 50 points can be earned by completing these activities.

Assessment

Five mid-term examinations and a comprehensive final exam will be given this semester to assess your learning in CHEM 101. Exams will consist mainly of general knowledge and problem-solving questions; however, there also may be essay, short answer, true-false, matching, and/or fill-in-the-blank questions. Questions will be similar in nature to the homework problems and the problems provided during problem solving sessions.

Exams will be given at the start of class on the dates listed in the table below. Students will be given 50 minutes to complete each exam. Exams will be worth 100 points each, for a total of 500 points.

The comprehensive final exam will be given at the start of our scheduled time (see the table below). Students will be given 120 minutes to complete the final exam. The final exam will be worth 150 points and will consist of questions from Units 1, 2, 3, and 4. There will be 40 points of questions from each unit, resulting in a maximum possible score of 160/150.

Students are expected to take all assessments at the scheduled time with the entire class unless alternative arrangements have been made in advance. If the student must miss an assessment due to illness, family emergency, weather, or other valid reason, the instructor must be contacted within 24 hours of the assessment, preferably via email or in person, in order to schedule a make-up opportunity.

Exam	Date	Coverage
1	Friday, September 5th	Unit 1: CH 1, CH 2, CH 3 (Sections 3.1 and 3.2)
2	Friday, September 26th	Unit 2: CH 3 (Sections 3.3 and 3.4), CH 4, CH 5, CH 6
3	Friday, October 17th	Unit 3: CH 7, CH 8, CH 9
4	Friday, November 7th	Unit 4: CH 10, CH 11, CH 12, CH 13 (Section 13.1)
5	Friday, December 5th	Unit 5: CH 13 (Sections 13.2-13.4), CH 14, CH 15, CH 16
Final	Tuesday, December 9th (12:00 – 2:00 PM)	Cumulative (Units 1-4)

Laboratory

An essential component of any chemistry course is the laboratory, where students are given the opportunity to perform hands-on experiments to directly experience the interactions of chemicals, make connections between the observable and the intangible, and gain a better understanding of the course material. In the lab, students will be expected to record observations, data, and other important information to test hypotheses, formulate conclusions, and answer questions. The main objective of recording observations and data using scientific language is to help the student gain experience to become an independent and creative learner. Students will be exposed to some of the experimental tools that chemists use to study the world around them and will be required to make the type of assumptions and conclusions that scientists must make in their daily lives. By completing the laboratory, students will not only reinforce their understanding of the course material, but they will also learn skills that transfer to other fields, such as nursing and exercise science.

In this laboratory, students will complete three paper labs and eleven wet labs throughout the semester. Paper labs will be completed in your assigned lab room (FB 358, 360, 365, or 367). Students are expected to bring their lecture notes, calculator, textbook access, and lab manual to all paper labs. Each paper lab is worth 25 points. To earn the 25 points, students must work the entire lab period or turn in a completed lab write-up.

Wet labs will be completed in your assigned lab room (FB 358, 360, 365, or 367). Students are expected to come to each wet lab prepared to complete the experiment. Pre-lab videos and other useful information are available on the Lab Course website to help students prepare for wet lab. Students must watch the pre-lab video and complete the pre-lab quiz each week prior to the due date/time to be eligible to attend the wet lab. While completing the wet lab, students will report observations, data, results, and conclusions by completing the laboratory worksheets provided within the lab manual (see the Lab Syllabus). Students will discover that they gain a better understanding of an experiment as they analyze the data and observations. Laboratory reports will be assessed based on the following criteria:

- observations, results, and/or conclusions are recorded using proper scientific language and grammar
- calculations are performed correctly with numerical results reported using correct precision and units
- data and results are interpreted correctly
- questions are answered correctly

Each lab report is due by the end of the lab period and is worth a total of 25 points (5 points for the pre-lab quiz and 20 points for the write-up). Students will receive a lab syllabus in the lab, which describes your responsibilities in more detail.

We will meet for lab on Monday, December 9th to complete a final exam preparation worksheet. Students who complete the worksheet will receive 10 extra credit points.

A student's lab grade will be determined based on a percentage of the total number of points earned in the lab. The lowest wet-lab write-up score will be dropped when determining a student's overall lab score; thus, a maximum of 335/325 points can be earned by completing all 15 laboratories. The percentage in the lab will be multiplied by 1.5 to determine a student's lab score, resulting in a score based on a maximum of 150 points (i.e. a student who earns 90.0% (292.5/325) in the lab will receive a lab score of 135).

Please note that successful completion of the laboratory is a required part of the course. **You must participate in and pass the lab with a minimum of 75% of the total points to pass CHEM 101. Scoring less than 75% in the laboratory will result in an automatic F for the course**, regardless of your lecture grade**.**

Laboratory Safety

Students enrolling in this course will be working with a variety of chemicals, some of which could be irritating or hazardous. Proper and accepted good laboratory practice will always be utilized to minimize or eliminate any adverse contact. However, individuals with sensitive medical conditions (including pregnancy) should take precautions such as wearing additional protective garments, delaying enrollment, or not enrolling in this course. Information about how to obtain Material Safety Data Sheets (MSDS) for chemicals used in this course is available in the Chemistry department office, FB 417. Please consult with your instructor and health care professional if you have any concerns.

To ensure safety of all individuals in the laboratory, safety goggles and lab coats must be worn at all times in the lab. The safety goggles must be rated splash-proof (with no open holes). Lab coats must have long sleeves and cover to the knees.

Also, students must dress appropriately in the lab. Students must wear pants, skirts, or dresses that cover the tops of their feet; shirts that cover the neck through to the waist; and closed-toe shoes in the lab. Pants must cover all skin (no holes or tears) from hip to ankle and should be loose-fitting (yoga or other forms of tight pants are highly discouraged as spills can more easily make contact with the skin). Shoes must cover the toes and top of the feet. Long hair must be pulled back and restrained. Any student who is not dressed in a safety-appropriate manner will not be permitted to enter the lab room until they are dressed appropriately.

Additional safety protocols relevant to each experiment will be presented in the pre-lab videos and lab manual. Students who do not watch the pre-lab video(s) and complete the pre-lab quiz will not be permitted to complete that week's experiment.

Learning Chemistry

Learning chemistry should be approached as if you were learning a foreign language. Chemists use symbols and scientific terminology to relay information, which must be learned in order to understand scientific theories and laws. Knowing the symbology and terminology is only the first step; however, more will be required to gain a thorough understanding of chemical principles. You will be expected to learn chemistry by:

- preparing for each lecture by reading the textbook;
- attending all lectures; actively listening during lecture; taking meticulous and legible notes during lecture;
- recording observations and conclusions during in-class demonstrations;
- participating in class discussions; completing in-class activities;
- reviewing notes outside of lecture; working on sample problems in the textbook; participating in study sessions;
- working on assigned problems; completing all online assignments through Achieve;
- reviewing graded material; reworking problems answered incorrectly;
- preparing for the lab by completing all pre-lab assignments; dressing appropriately for and attending all laboratory sessions;
- and completing all laboratory experiments by making observations, collecting data, interpreting qualitative data, analyzing quantitative data, performing calculations, formulating conclusions, and answering all questions.

A large amount of material will be covered in this course. It is best learned by engaging the material every day and in parts. Waiting until the day before an assessment to begin studying will leave an overwhelming amount of material to be learned in too little time. To help you stay organized, detailed lists of specific unit objectives are available on the course website.

Grading

A total of 1000 points are possible in CHEM 101. The points will be distributed as follows:

iClicker Cloud (attendance and questions)	50
Exam Review Activities	50
Homework	100
Laboratory	150
Mid-Term Exams	500
Final Exam	150
Total points possible	1000

The grade that a student receives in CHEM 101 will be based on the following earned points:

930 or more	A	730 − 769	C
900 − 929	A−	700 − 729	C−
870 – 899	B+	670 – 699	D+
830 − 869	B	630 – 669	D
800 − 829	B−	600 – 629	D−
770 − 799	C+	less than 600	F

University Policies and Statements

University Statement

We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse. If you need course adaptations or accommodations because of a disability, please contact the instructor of record as soon as possible. Ball State's Disability Services office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or dsd@bsu.edu.

Learning Center Statement

The Learning Center offers free tutoring and academic coaching for many courses at Ball State. Students can make appointments for online (Zoom) or in-person (NQ 350) appointments. To make an appointment, visit my.bsu.edu and click on "TutorTrac" in the Additional Tools section, or just go directly to https://ballstate.go-redrock.com.

Counselling Center Statement

The Ball State University Counseling Center offers free and confidential services to all students. The Counseling Center is located in Lucina Hall, Room 320. To schedule an appointment, you can contact us at 765-285-1736. Ball State also offers a 24/7 Crisis Line, which can be reached at 765-285-HOPE (4673). The Crisis Line is a mental health resource for those who are struggling with any mental health concerns, including thoughts of self-harm and/or suicide. At the Ball State Counseling Center, we see students for a variety of reasons, some of which include homesickness, relationship concerns, anxiety, and depression. At your first appointment, you will work with a therapist to create a plan that will connect you with resources that best fit your needs. We assist students with getting connected to therapy at our Center as well as connecting students to self-help resources, other on-campus resources, and community-based resources. All Ball State students also have access to several on-demand, self-help resources through a variety of different platforms. All these resources, including a direct link to our website, can be found here:

https://www.bsu.edu/campuslife/counseling-center

The University Core Curriculum

The central purpose of the University Core Curriculum is to enable women and men to live rich, satisfying lives and to undertake the broad responsibilities of citizenship in a free society. Although it seeks to discover and nurture individual talents, the core curriculum's primary emphasis is on preparation for roles that people share in common as human beings as well as members of family and community groups. The spirit of the core curriculum emerges from the kinds of intellectual attitudes the university strives to develop in students. Through their core curriculum courses, students will be able to:

- engage in lifelong education by learning to acquire knowledge and to use it for intelligent ends.
- communicate at a level acceptable for college graduates.
- clarify their personal values and be sensitive to those held by others.
- recognize and seek solutions for the common problems of living by drawing on a knowledge of historical and contemporary events and elements of the cultural heritage surrounding those events.
- work with others to solve life's common problems.
- assess their unique interests, talents, and goals and choose specialized learning experiences that will foster their fulfillment.

Withdrawals

The course withdrawal period begins Monday, August 18th and ends **Monday, October 27, 2025**. Students wishing to withdraw from a course during this period should first discuss the withdrawal with their instructor. All student-initiated withdrawals will be recorded as a final grade of *W* during this period. However, students who discontinue enrollment or who abandon courses without following the withdrawal policy's procedures will normally earn a failing grade in those courses. Students should contact the Office of Financial Aid and Scholarships prior to withdrawing to determine how any financial aid will be affected. To see the impact of the withdrawal on a bursar account, view your ebill account online. Additional information can be found on the Bursar Office website.

For additional details, see *Degree Requirements and Time Limit* in the current Undergraduate Catalog.

Department Policies and Statements

Calculators

Only TI-30X series calculators will be permitted on quizzes and exams. If you do not bring one to class with you, you will be required to perform any calculations by hand and will not be given extra time. If you use any other type of calculator, you will receive a 0 on the quiz / exam.

Lab Course Notice

Students enrolling in this course will be working with a variety of chemicals, some of which could be irritating, hazardous, and/or toxic. Proper and safe laboratory practices must be utilized to minimize or eliminate any adverse contact. However, individuals with sensitive medical conditions (including pregnancy) should take precautions, such as wearing additional protective garments, delaying enrollment, or not enrolling in this course. Links to Material Safety Data Sheets (MSDS) for chemicals used in this course are available on the Lab Course site. Please consult with your instructor and health care professional if you have any concerns.

Some Tips

…when sending email

- **Include a clear, direct subject line.**
- **Think twice before using "reply all".**
  I often will send email to more than one recipient. It is best practice to reply only to me unless you intend for all of those emailed to read your reply.
- **Proofread every message.**
- **Be mindful of your tone.**
  When emailing, your tone cannot be heard. Thus, you should choose your words carefully. An innocent inquiry or comment can be misjudged, especially when written in an email. Also, jokes and sarcastic remarks do not always come across as intended in an email—they often require certain facial expressions or tone to be interpreted correctly. Try reading your email out loud. If it sounds harsh or abrupt to you, it will probably come off that way to the reader. Try using words such as *please* and *thank you* to ensure your reader will understand your intent.

  I understand that college can be frustrating, feel overwhelming, and/or make you very angry or upset. It is usually best not to send any email when you are feeling overly emotional. By all means, write the email while your body is full of rage or while those tears are pouring from your eyes; however, wait to send the message until you are feeling more like yourself. You may be embarrassed by the message you wrote and thankful that you didn't send it with its current content or tone.
- **Use exclamation points sparingly.**
- **Use professional salutations.**
  Use *Hi*, *Hello*, or *Dear* instead of *Hey* or *Yo* when addressing faculty and fellow professionals. Use proper titles, such as *Mr.*, *Mrs.*, *Ms.*, and *Dr*. Informal salutations should be reserved for close friends.
- **Keep your fonts classic.**
  It is best to use 10- or 12-point type, black color, and easy-to-read fonts, such as Arial, Helvetica, Calibri, or Times New Roman when sending email. Bubblegum Chalkduster has a time and place (I suppose), but email is not it.
- **Nothing is confidential in an email.**
  It is better to be safe than sorry when writing email. Emails are very easy to forward, print out, and intercept. Assume that others will see what you send. Never write anything that would be ruinous to you or hurtful to others. Students often feel the need to be very descriptive in emails sent to faculty. Please do not feel that details should be included in an email you send to me. Instead, when necessary, schedule an appointment with me where those details can be expressed verbally and in private.
- **Sign off on the email.**
  An often-overlooked feature of emails is signing your name at the end of the message. When texting, including your identity is not important. However, signing off on an email is essential—especially if your email address does not include your full name. It is best to create a signature block which includes contact information. That way, if you forget the signature, at least your signature block will be there. As students, your signature block should contain your given name (with your preferred name in parentheses), department affiliation or major, university, and email address—other contact information is optional. Once you graduate and find a job, it should include your full name, title, company, and contact information, including a phone number. Be certain to use the same font, type size, and color as the rest of your message.
- **Use your BSU email address for University business ONLY.**
  Use your BSU email for emailing faculty, fellow students, and others you contact as a representative of Ball State. You most likely have another email address. If you don't, create a separate account for emailing friends, family, and non-university entities. Never use your BSU email to contact government representatives (such as Sue Errington, Timothy Lanane, Greg Pence, Todd Young, or Mike Braun), as login information on websites (such as Facebook or Twitter), or for merchant spam (such as receiving Kohl's specials). This will keep your BSU inbox clear of unwanted spam and make it easier for you to see those important messages sent by me. ☺

…when studying chemistry

- **Before class**:
  Review the previous material, answer associated SmartBook/Connect problems, and work any assigned problems out of the textbook or in-class homework. Then, read the relevant sections of the textbook and prepare questions over that material.
- **Soon after class**:
  Go over your notes very carefully. Check to see if your questions were answered. Clear up anything which is not understood by checking in your book or notes, with a classmate, or with the instructor.
- **Before an exam**:
  Try to recite or write down the important points on each page of your notes from memory. Try to say in words each key idea listed on the objective sheets. Work the assigned problems and keep working them until you understand why you worked them the way you did. There's more to learning chemistry than just memorizing facts; you must learn good problem-solving skills, as well.
- **Tips when trying to solve problems**:
  First, try to work any assigned problems without looking at the textbook, your notes, or the answers (if available). If you do not know how to begin solving a particular problem, (1) list all the relevant information, (2) identify the quantities to be calculated, and (3) ask yourself what equations, laws, or theories connect what is known to what is unknown. Then, try to answer the question. If that doesn't work, look in the textbook for worked examples similar to the assigned problem. Read through the solution until you understand how the problem was solved. If you still have trouble, ask a classmate, your lab TA, or your instructor for help.

  Problem solving is an active process. Listing the information and actively searching for relationships that connect that information gets your mind working on the problem. Sitting and reading the problem over and over again does not get you anywhere.

  The main hurdle is step (3). It may be a complex task at first to make the correct connections. However, with enough practice you can become an expert! Treat problem solving like a sport—would you expect to be an expert at hitting a softball if you never picked up a bat? Using that same reasoning, you can't expect to become good at problem solving if you don't practice. Learning good problem-solving skills can be a frustrating experience. The trick to success is never giving up. When you start feeling frustrated, stop and seek help. There are plenty of resources available to help you succeed in this course.
- **Some Do's and Don'ts**:
  Do study chemistry every day! Research has shown that studying 20 minutes every day is better than studying for a three-hour session once a week.

  But, don't spend a lot of time getting ready to study; just study.

  Do form study groups! Research has shown that we learn better from our peers than from experts. And, it helps with your own understanding when you try to explain concepts and problem solving to others.

  But, don't study with chatty classmates who prefer to gossip—they will distract you from the task at hand.

  Do try to learn all the material! Mastering this subject requires that you are capable of making connections between all interrelated facts and concepts covered throughout this course.

  But, don't waste too much time on a single concept that's giving you trouble; it might not even appear on the exam.

  Do extra preparation the evening before an exam! Research has shown that reviewing the evening before an exam does improve performance (surprising, I know).

  But, don't expect to do well on the exam if you wait to cram the night before—in fact, don't even expect to pass.

  Do eat something before an exam! Thinking during the exam requires energy. Studies have shown that eating carbohydrate-rich foods (such as rice, pasta, and potatoes) the night before and protein-rich foods (such as eggs, nuts, yogurt, and fish) the day of the exam improves exam performance.

  But, don't eat turkey or foods made with white flour and/or refined sugar before an exam. Eating turkey, cookies, cakes, chocolates, or candy will make you feel sluggish and tired during the test.

  Do drink water before and during an exam! Studies show that dehydration can make you lose concentration or make you feel faint during the exam.

  But, don't drink beverages containing alcohol or high amounts of caffeine. Alcohol lowers your ability to reason and remember. Being over stimulated can increase your nervousness and reduce your ability to focus.

  Do get a good night's sleep (at least eight hours) the night before an exam! Being well-rested will lower your stress and help you think clearly during the exam.

  But, don't sleep through the test.

NOTE: All information and dates listed in this syllabus are tentative and subject to change. Any changes will be announced in lecture and on the course website.