

Chemistry 131 – Chemical Principles I
Fall 2019

I. General Information

<u>Instructor:</u>	Dr. Brian Lamp Office: MG3106	Phone: 785-7251	E-Mail: blamp@truman.edu Internet: blamp.sites.truman.edu
<u>Schedule:</u>	Lecture	MWF	8:30-9:20 AM MG1000
	Lab Section 05 Dr. Cassidy Dobson	T	8:30 AM -11:20 AM MG1023
	Lab Section 06 Dr. Jim McCormick	W	2:30 PM -5:20 PM MG1023
	Lab Section 07 Dr. Brittany Hagenhoff	Th	11:30 AM -2:20 PM MG1023
<u>Office Hours:</u>	Office hours are posted outside Dr. Lamp's office and on Dr. Lamp's website. If you are unable to meet during these hours when in need of help, please arrange a time with the instructor IN ADVANCE.		

II. Course Philosophy and Goals

Important Advice: Your success in this, or any course, is directly related to the effort you put forth as you move through the semester. Procrastination and inefficient study habits are two of the primary reasons students struggle in their courses. Develop a good study plan and stick with it and you will find yourself a much happier and more successful student!

Philosophy: Chemistry 129, 130 and 131 are courses that provide a foundation for many other courses in chemistry and biology. Throughout these courses you will be introduced to a great deal of information. We will not spend a great deal of time on any one topic. Even though we do our best to maintain continuity, at times it may seem like we are skipping from one subject to the next without covering anything in detail. It will help if you remember that you are learning many concepts and techniques that will be very useful in upper-level courses.

Course Goals: In the framework of gaining a better understanding of how science works and the thought processes needed to tackle complex problems, we intend:

1. To learn some fundamental concepts and facts in the field of chemistry.
2. To prepare for more advanced chemistry courses.
3. To learn fundamental skills and safe lab practices.
4. To learn to approach and solve problems in a logical and efficient manner.
5. To enjoy learning about chemistry!

Outcome statements for CHEM 131 are at: <http://chemlab.truman.edu/chem131/>

Time Expectation: The minimum investment of time by the average Truman student necessary to achieve the learning goals in this course are typically not less two hours of out of class student work each week per lecture hour. This time is spent working problems, reading and preparing for lecture, and studying for exams and quizzes. An additional three hours per week is typically used for preparing for lab and writing lab notebooks and lab reports. This estimate for an average student may have weekly variations.

III. Required Materials

Textbook: "General Chemistry: Principles & Modern Applications", 10th Ed., Petrucci, Herring, Madura and Bissonette, 2011. (ISBN 978-0-13-206452-1)

Laboratory Manual: The laboratory manual for Chemical Principles, as well as other lab information is online at <http://chemlab.truman.edu>.

Laboratory Notebook: A permanently bound laboratory notebook capable of creating duplicate pages is *required*. You must have this notebook by the first lab.

Safety Glasses: All students are required to have departmental approved *safety glasses or goggles* for use in the laboratory. These goggles must meet ANSI Z87 or Z87.1 standards. Strict compliance of this rule will be maintained at all times. These will be necessary for the **first scheduled laboratory experiment** and all labs thereafter.

Laboratory Attire: Proper lab attire will be required at **ALL** lab sessions. In addition to safety glasses, you must always attend lab wearing long pants, close-toed shoes, and a shirt that covers the upper body (at least equivalent to a crew neck tee-shirt). Inappropriately attired people are not allowed in lab. **Tights or yoga pants are not allowed in lab.**

Calculator: You must have a *hand-held scientific calculator* capable of scientific notation for use on homework problems, quizzes, and exams. It will be assumed that you have a calculator for all quizzes and exams. The instructor will not loan calculators. You cannot use the calculator on your phone for quizzes and exams.

IV. Lecture

Coverage: The lecture portion of the course will explore and elaborate on topics presented in the text. It does not make sense for me to repeat all of the material in the text. I will introduce topics and elaborate on points that are particularly essential or challenging. I expect you to read chapters that we cover *in their entirety* and to ask questions about what you read.

Exams: Four in-class exams worth a total of 400 points will be given. Tentative dates are: **September 11 (W), October 9 (W), November 6 (W), December 4 (W)**
A comprehensive final exam will be given **Friday, December 13** from 7:30 AM - 9:20 AM. The final exam will be worth 200 points.

Online Homework: We will utilize Sapling Learning's online homework system in this course. Instructions for setting up an account are at: <https://community.macmillan.com/docs/DOC-5972-sapling-learning-registering-for-courses>. There is a \$42 fee for access to the system for the semester, but the instant feedback and guidance that the system provides as you solve problems makes it a very good investment! Sapling Learning offers a grace period on payment; for most courses, this is 14 days from the first day of the term. During sign up or throughout the term, if you have any technical problems or grading issues, consult Sapling's student support community, <https://community.macmillan.com/community/digital-product-support/college-students-support-community>, for assistance from their technical support team.

Quizzes & Other Assignments You are welcome to study in groups and work with one another on homework, unless instructed otherwise. While working in groups to solve problems is very helpful, the result is usually a "group" assignment that does not adequately reflect whether you learned the material. In addition to online homework, we will have weekly quizzes of 10-15 minutes. These quizzes will be given in class each Wednesday (except for weeks we have an exam). Many questions for the quizzes will be taken **directly**, or with slight alteration, from the assigned homework. Your reward for doing your homework conscientiously should be good performance on these quizzes. Additional individual or group assignments may also be given.

IV. Laboratory

Laboratory Philosophy: Experimentation is at the heart of chemistry. The vast majority of the new knowledge in chemistry comes from careful examination and interpretation of experimental results. In order for you to have confidence in your results, it is important that the experiments be executed carefully and properly. The Chemical Principles laboratory is designed to teach you lab skills, reinforce concepts from lecture, and show you how to think about scientific problem solving. The importance of lab is reflected in the fact that it counts for over 20% of your final grade.

Lab Notebooks: The purpose of a research lab notebook is to enable you or any other worker to understand your experiment and duplicate your work. Although we are not operating in a research environment, my goal is to teach you the habits that will make you a better scientist in the future. You are required to maintain a permanently bound and numbered lab notebook, capable of making duplicate pages that will be handed in for grading. Before coming to lab you must familiarize yourself with the theory,

techniques, and safety precautions for the experiment. I expect all students to come prepared for lab. Poor preparation will not only lead to poor results, but will also result in loss of points for prelab preparation.

You must have all the information necessary to do the lab written in your notebook **before lab**. This includes: the title of the experiment, a statement of purpose of the experiment, appropriate background and safety information, an outline of the procedure that will be followed, and blank data tables if necessary. Failure to come prepared will result in a loss of points. All results and observations must be written **directly** in the notebook, students who make temporary entries on random pieces of paper or paper towels will find them vanishing (the papers, not the students!).

Other guidelines/rules:

- **Record everything directly in your lab notebook, not on other paper!**
- **Always write in your notebook in PEN, not pencil!**
- Mistakes in the lab notebook should be crossed out with a single line. Whiteout, etc. is not acceptable.
- All labs should be completed in chronological order. The write-up for one experiment should be completed before the next write-up begins.
- Write your name and a running title for the experiment on the top of each page. **Sign and date the bottom of each page as it is completed.**
- Your notebook must have an up-to-date table of contents on the first page.
- Computer-generated tables and graphs are encouraged where appropriate. Such material must be inserted permanently into the notebook with a copy on both the original and carbon copy page and must be accompanied by filename and location of the computer file.
- Affix printouts to notebook pages with glue or tape (not staples). Do NOT staple printouts to the notebook pages! Adjust print settings and/or trim printouts so that they fit within the constraints of a single page and allow the pre-printed page number to show.
- **Paper must not hang out over the notebook page!**
- If you are working in a group and only one member of the group records data at the time of the experiment, you must indicate in your notebook that the original results were copied from the other person's notebook. Give the page number of the original results.

Lab
Grading:

The laboratory component of the course has a major bearing on your overall course grade. Your lab notebook and lab reports will be instrumental in evaluation of your preparation, documentation, and understanding of the experiments. Five of these reports will be graded for 25 points each. The Vitamin C lab will be graded as a 50 point "project". Prelab quizzes and notebook checks may be utilized to evaluate preparation for each lab meeting.

VI. Grading

Grade point
breakdown:

Letter grades will be determined based on the percentage derived from the breakdown shown below.

<u>Source</u>	<u>Grade Point Distribution</u>
4 Exams	400 pts. maximum
10 Quizzes	250 pts. maximum
Final Exam	200 pts. maximum
Homework	100 pts. maximum
Misc. and Group Assignments	100 pts. maximum
10 Experiments	100 pts. maximum
Lab Quizzes	100 pts. maximum
Environmental Lab	50 pts. maximum
5 Lab Reports	125 pts. maximum
Total points	1425 pts. maximum

<u>Grading Scale:</u>	Awarding of final class grades will be based on a 90-80-70-60 scale. Percentages will be based on the total possible points for the semester. <i>I reserve the right to lower the grading scale, but it will never be raised.</i>
<u>Late Hand-ins:</u>	No late work will be accepted. All assignments will be given a specific deadline, anything turned in after the deadline without prior approval will earn a score of zero.
<u>Make-ups:</u>	No make-up exams, quizzes, or labs will be given without prior approval. If you cannot attend a scheduled exam for a <u>valid, instructor-approved reason</u> , notify Dr. Lamp IN ADVANCE and an arrangement will be made. No credit will be given for missed labs, exams or quizzes without prior instructor approval. Valid reasons include traveling with a University-sponsored organization, illness, or death in the family. If a sudden, unexpected event occurs that causes your absence, contact the Student Affairs Office and they will contact me. Also, please leave a voice or e-mail message for me and contact me immediately upon your return.

VII. Policies and Other Information

<u>Academic Integrity:</u>	Students are expected to abide by the Truman State University Student Conduct Code and complete their coursework, including exams and laboratories using their original words and ideas and properly cite the words and ideas of others. Students caught committing an act of academic misconduct will be subject to the full range of penalties, including failing the course. In every case, the Dean of Student Affairs office and the Vice President for Academic Affairs will be notified.
<u>Special Needs:</u>	Any student who has a disability that may prevent him/her from fully participating in class activities must contact the Office of Student Access & Disability Services (x4478) immediately to ensure that your needs are properly met. For more information, see http://disabilityservices.truman.edu/
<u>Mobile Devices:</u>	<u>Unless you are an emergency responder, all mobile devices must be turned off and stored while in lecture.</u> Class disruption due to your mobile device will result in dismissal from the class session (this includes exams). This policy includes texting.
<u>Emergency Procedures:</u>	In each classroom on campus, there is a poster of emergency procedures explaining best practices in the event of an active shooter/hostile intruder, fire, severe weather, bomb threat, power outage, and medical emergency. This poster is also available as a PDF at this link: http://police.truman.edu/files/2015/12/Emergency-Procedures.pdf . Students should be aware of the classroom environment and note the exits for the room and building. For more detailed information about emergency procedures, please consult the Emergency Guide for Academic Buildings: http://police.truman.edu/emergency-procedures/academic-buildings/ This six-minute video provides some basic information on how to react in the event there is an active shooter in your location: http://police.truman.edu/emergency-procedures/active-shooter/active-shooter-preparedness-video/ Truman students, faculty, and staff can sign up for the TruAlert emergency text messaging service via TruView. TruAlert sends a text message to all enrolled cell phones in the event of an emergency at the University. To register, sign in to TruView and click on the "Truman" tab. Click on the registration link in the lower right of the page under the "Update and View My Personal Information" channel on the "Emergency Text Messaging" or "Update Emergency Text Messaging Information" link. During a campus emergency, information will also be posted on the TruAlert website http://trualert.truman.edu/ .
<u>Attendance etc.:</u>	It is expected that everyone will attend class and participate. Although attendance is not mandatory, roll will regularly be taken. Attendance records are a factor in determining borderline grades at the end of the semester. Students with sanctioned absences will not be penalized for being absent, but will be expected to make up any missed work within a reasonable length of time. The professor reserves the right to deem additional absences as unsanctioned once a student has missed 6.67% of class time for sanctioned absences. A list of sanctioned absences can be found in the



General Catalog (see link below). For an absence to be sanctioned, students must notify the professor of scheduled absences during the free add/drop period and as soon as possible for any other absences. Students should also provide the faculty member with written notification of the absence. Arrangements for making up work should be made prior to the absence. If the absence is unexpected, the student must arrange to make up the missed work as soon as possible. Students must realize that making up missed laboratory experiments is very challenging and may not be logistically possible in all instances. The complete Truman Attendance Policy can be found in the General Catalog (click on "Attendance Policy"):
<http://catalog.truman.edu/content.php?catoid=14&navoid=691>

Title IX:

Truman State University and its faculty are committed to supporting our students and fostering an environment that is free from bias, discrimination, and harassment. If you have encountered any form of sexual misconduct (e.g., sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member is a "mandated reporter" and must notify Truman State University's Institutional Compliance Officer and share the basic facts of your experience. The Officer will then be available to assist you in understanding all of your options and in connecting you with resources both on and off campus. If you would prefer to have a confidential conversation about an experience, the counselors at University Counseling Services are NOT mandated reporters and they can be reached at 660-785-4014. For after-hours crisis counseling, call 660-665-5621. For more information regarding Truman's policies and procedures, please see <http://eoaa.truman.edu/university-non-discrimination-policy/> and <http://eoaa.truman.edu/complaint-reporting-resolution-procedure/>.

FERPA:

Education records are protected by the Family Education Right to Privacy Act (FERPA). As a result, course grades, assignments, advising records, etc. cannot be released to third parties without your permission. There are, however, several exceptions about which you should be aware. For example, education records can be disclosed to employees or offices at Truman who have an "educational need to know". For more information FERPA, see <http://www.truman.edu/registrar/ferpa/>.

Misc. advice
and info.:::

- All assignments in lab and lecture *must be written legibly and in a well-organized fashion*. If an answer or work cannot easily be interpreted, no credit will be given.
- All mathematical work and assumptions used when solving a problem, whether on homework, quizzes or exams, *must be shown in order to receive credit for the problem*. Please mark your answers clearly.
- Trim edges of spiral notebook paper and **staple multiple sheets** prior to submission. Points will be deducted if this is not done.
- Do not procrastinate!!! Your understanding of lecture material, and grades on homework and exams will be adversely affected by this approach. *It is strongly recommended that you work ahead on reading and homework and participate fully in classroom discussions and problem solving sessions*. The instructor reserves the right to not answer "panic" questions on the day of an exam and will certainly be stingy with time other than his office hours on the day prior to an exam.
- Behavior that persistently or flagrantly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be asked to leave class pending discussion and resolution of the problem and may be reported to the Office of Student Conduct.

VIII. Anticipated Class Calendar: This is only a guide, our schedule may vary.

	Topic	Chapter
A	Atomic Structure & Quantum Theory	8
B	Atomic Electron Config. & Periodicity	8/9
C	Bonding and Molecular Structure	10
D	Orbitals and Chemical Bonding	11
E	Organic and Carbon Chemistry	26
F	IM Forces, Liquids and Solids	12
G	Solutions and Their Behavior	13
H	Thermodynamics Review	7/19

	Topic	Chapter
I	Chemical Equilibrium Review	16-18
J	Structure, Reactivity & Acid-Base	16/17
J*	Solubility Equilibria	18
K	Electron-Transfer Reactions	20
L	Transition Metals & Coord. Chem.	23/24
M	Nuclear Chemistry	25
N	<i>Chemical Kinetics Review</i>	14
O	<i>Main Group Elements</i>	21/22

August

	M	T	W	Th	F	Lab
Date	19	20	21	22	23	NoLab
Topic	A		A		A	
Date	26	27	28	29	30	Check in, Safety, etc.
Topic	B		B/Quiz		C	

September

	M	T	W	Th	F	Lab
Date	2	3	4	5	6	Coordination Chemistry: Synthesis
Topic	Labor Day		C/Quiz		C	
Date	9	10	11	12	13	Coordination Chemistry: Co Kinetics
Topic	C		Exam		D	
Date	16	17	18	19	20	Coordination Chemistry: Fe(ox) _x Characterization.
Topic	D		D/Quiz		D	
Date	23	24	25	26	27	Molecular Models
Topic	E		F/Quiz		F	

October

	M	T	W	Th	F	Lab
Date	Sept. 30	1	2	3	4	Computational Chemistry
Topic	F		G/Quiz		G	
Date	7	8	9	10	11	No Lab
Topic	G		Exam	Mid	Term Break	
Date	14	15	16	17	18	Gas Chromatography
Topic	H/I		J/Quiz		J	
Date	21	22	23	24	25	Qualitative Analysis
Topic	J		J/Quiz		J*	
Date	28	29	30	31	Dec. 1	Qualitative Analysis
Topic	J*		K/Quiz		K	

November

	M	T	W	Th	F	Lab
Date	4	5	6	7	8	Qualitative Analysis
Topic	K		Exam		K	
Date	11	12	13	14	15	Electrochemistry
Topic	K/L		L/Quiz		L	
Date	18	19	20	21	22	Environmental Chemistry
Topic	L		M/Quiz		M	
Date	25	26	27	28	29	
Topic			Thanksgiving	Break		

December

	M	T	W	Th	F	Lab
Date	2	3	4	5	6	Presentations/ Check Out
Topic	M		Exam		Review	
Date	9	10	11	12	13	Finals Week
Topic					Final Exam	