

2015

# Chemistry 101-007 General Chemistry I Fall 2015

C. Britt Carlson

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## Fall 2015: CHE 101-007: General Chemistry I

**Instructor: C. Britt Carlson, PhD**      **Email (preferred): [bcarlson@parkland.edu](mailto:bcarlson@parkland.edu)**

**Student Office Hours (drop-ins welcome): M 11-12, W 11-1, R 1-2, F 1-2**

**Office: L133**

**Phone: 217-353-2132**

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<b>Course Information</b>	<b>CHE 101 – 007</b>	
	Class Meetings: WR 3-4:50	Rm. L-242
	Lab Meetings: T 2-4:50	Rm. M-232
	Final Exam: R 12/17 2-4PM	Rm. L-242* (might change)

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**Required Materials:**      **Textbook:** Burdge, Atom's First Chemistry (2<sup>nd</sup> Edition, McGraw-Hill 2015), with Connect Plus homework system.

**Lab Manual:** "CHE 101 Experiments", Parkland Chemistry Staff.

**Others:** Scientific Calculator (with log function), safety goggles, lab notebook (Student Lab Notebook with Spiral Binding).

**Prerequisites:**      Recent **high school chemistry** or completion of **CHE100** with a grade of **C or higher**. Completion of **MAT 098**, or equivalent with a grade of **C or higher**.

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### **Attendance:**

On **8/31** I am required to assess your attendance. If you have not attended to that point, you will be dropped with no refund of tuition and fees. After this census date, you should not plan on an instructor withdrawal if you want to withdraw from the course. You are ultimately responsible for your own withdrawal by the withdrawal date. Non-attendance after the census date will result in an F if you don't withdraw yourself. Attendance at all laboratory sessions, including the first week of class, is required and absences can lead to failing the course. You are responsible for all material and announcements that you may miss if you are absent. You can expect to invest *at least* 8-12 hrs/week outside of class. **Few people will do well in this class if they do not study and spend the time.**

Please refer to the laboratory information sheet for important information about the laboratory component of the class. Anything covered in lab can be included in lecture quizzes, homework, and exams.

### **Mass Notification System:**

In the event of a significant campus emergency, Parkland College will activate the mass notification system. We encourage you to sign up for this free service and select how you would like to be notified: text message, audio message, or email message. Sign up at <http://www.parkland.edu/police/emergency-alert.aspx>

### **Cell Phone Policy:**

Cell phones should be set to vibrate mode during all class periods. Cell phones should not be used in lieu of a watch, stop watch, calculator, and/or reference guide.

***Disabilities:***

If you believe you have a disability for which you may need an academic accommodation (e.g. an alternate testing environment, use of assistive technology or other classroom assistance), please contact: Cathy Robinson, Room U-260, 217-353-2338, [crobinson@parkland.edu](mailto:crobinson@parkland.edu)

***Center for Academic Success:***

If you find yourself needing assistance of any kind to complete assignments, stay on top of readings, study for tests, or just to stay in school, please contact the Center for Academic Success in D120 at 353-2005 or 351-2441. You may also email the CAS at [CenterForAcademicSuccess@parkland.edu](mailto:CenterForAcademicSuccess@parkland.edu). CAS provides free chemistry tutors.

***Writing Lab:***

The Writing Lab is a free service in which English instructors will review your writing projects, offer feedback, and answer your questions. The Writing Lab is located in the Center for Academic Success in Room D120. Go to the Writing Lab website <<http://www.parkland.edu/cas/writing-lab.html>> for more details.

***Academic Honesty:***

It is the student's responsibility to read and understand the Academic Honesty section of the Parkland College Student Policies and Procedures Manual. A portion of this section reads, "Depending upon the nature of the case, [the resolution of the incident] could carry the penalty of a failing grade for that assignment or for the course." See <http://www2.parkland.edu/studentpolicy/honesty.html>

***Core Values:***

We believe strongly in the Core Values espoused by Parkland College: **Honesty and Integrity, Fairness and Just Treatment, Responsibility, Multiculturalism, Education and Public Trust**

Essentially, these values set guidelines for how we should treat you and how you should treat each other (and us). Failure to be respectful of one another or to maintain ethical behavior will not be tolerated.

## Course Assessments and Schedule

### Contents:

The course covers the following topics. Refer to the learning objective – textbook alignment document on Cobra for more details.

Unit	Chapter	Topic
1	2	Atomic Theory and the Periodic Table
	3	Quantum Theory and the Electronic Structure of Atoms
	4	Periodic Trends
2	5	Bonding, Nomenclature and Moles
	6	Chemical Bonding I: Basic Concepts
	7	Chemical Bonding II: Molecular Geometry (VSEPR, Intermolecular Attractions, Valence Bond Theory, Hybridization)
3	8	Stoichiometry
	9	Reactions in Aqueous Solutions
	10	Thermochemistry
	11	Gases
4	12	Properties of Solids and Liquids
	13	Physical Properties of Solutions
	14	Thermodynamics
	15	Equilibrium

\*Special notes on Chapter 1: If you are correctly placed into this course, you have already studied these materials recently. Therefore, it is an unwise use of class time to go over this unit again. Please review this unit yourself and work on the HWMK bonus assignment. (You get 3 bonus points for the assignment). When you have refreshed your memory and are ready, you will take the timed on-line quiz by **Friday 8/28 at 10AM**. If you scored below 75%, it is highly recommended that you withdraw from the course and work on your chemistry and/or math skills before attempting this course again. Statistics show that students scored poorly on Quiz 1 typically were unsuccessful in the course.

### Exams:

Five exams will be given: four unit exams and one cumulative final exam. The unit exams will be given on-campus at the Testing Center for Natural Sciences (L-161). The class on that day will be canceled and you will have any time during the Testing Center hours to take the test that day and the next day (typically a Monday and a Tuesday). Refer to [my.parkland.edu](http://my.parkland.edu) for Testing Center regulations (bring your ID and know your course information: **CHE101-008, Carlson**). Since you are given 2 days to take the exam, there are **no make-up exams**. You must use the Testing Center's calculator.

#### Testing Center Hours:

9:00 am – 3:45 pm Monday through Thursday

9:00 am – 2:45 pm Friday

**Quizzes:**

10 quizzes will be given. One quiz grade will be dropped. Students will be expected to take the quiz on Cobra by a specified date and time. You will be allowed only **25min** each quiz. The quiz will then be automatically submitted and graded, whether you have finished it or not. Make sure to pay attention to the time. You cannot re-take the quiz, so make sure you are ready before you start (know the material and have scrap paper, calculator and pencil ready). The quizzes are short and only provide a few examples of questions. They will be different from the exams and not every concept or chapter will appear on the quiz, even if it might appear on the exam. Do not leave the quizzes to the last day. Each quiz is worth 15 points. **There are no makeup quizzes**. If you have any technical problems, contact TechSD at 217-353-3333 (<http://www.parkland.edu/techsd>). If you see an error or have a problem, contact me ASAP.

**Homework:**

Homework is one of the most important parts of this course. It helps you understand the material and better prepares you for quizzes and exams. Do not leave the homework assignments to the last day before it is due. Instead, finish problems in each section as we progress through the chapter. 14 sets of HWMK problems are assigned, each with 2 parts (a and b). You must complete both parts (a and b) to receive full credit. The homework system, Connect, is in an online format hosted on publisher website and can be accessed through Cobra. *If you have any technical problems, make sure call and get a case # from the Connect Plus help center before contacting me (see [mpss.mhhe.com](http://mpss.mhhe.com) for Customer Service details)*. To access Connect, you should receive an access code as part of your textbook package if you purchase it from Parkland Bookstore. Otherwise, you can purchase a stand-alone version of the access code (card) via the McGraw-Hill website. The lowest two HWMK grades will be dropped. Each HWMK is worth 10 points, except HWMK bonus, for which you will receive up to 3 bonus points. Due dates and times of the HWMK are available in the schedule included in this syllabus. **No late HWMK will be accepted**. The HWMK that is assigned is just a *small sample* of the work that you should be doing outside of class. You will be expected to read all of the pertinent chapter sections, do in-chapter problems and examples, and do end-of-chapter questions (the answers to the odd# questions are in the back of each chapter or the end of the book) in addition to this graded HWMK.

**Bonus Opportunities:**

There are several opportunities for bonus (extra credit) points in this class. All unit exams will include at least 1 bonus question, but there will not be a bonus question on the final exam. Up to 1 bonus pt can be earned by completing the Course Orientation quiz by **W 8/26 at 10AM**. For this quiz, you have unlimited attempts (before the due date) and it is not timed. Up to 2 bonus pts can be earned by attending a scholarly science talk (at least 1hr long), typing up a short reflection paper (~1pg) and handing it in within 1 week of attending the talk. Bonus pts are also awarded for completing homework 1 (refer to Homework section of the syllabus). Lastly, bonus points are awarded for participation in the Natural Sciences Poster Session. This is explained in more detail in the Special Project section of the syllabus.

### **Special Project:**

- This class involves a special project, which is due **in class and on-line on W 11/4. Late projects will not be accepted and will earn a 0%.**
- You can elect to do this project individually or in groups of 2.
- You can choose to make a poster or a PowerPoint presentation.
  - If you create a poster, make sure to use tri-fold poster board.
  - If you create a PowerPoint, you must submit this file electronically to a Drop-box on Cobra (you do not need to submit a hard copy of the PowerPoint).
  - Whether you create a poster or a PowerPoint, you must submit a Word file containing all of the content. This will be submitted to a Drop-box on Cobra and scanned for plagiarism and content. All projects must have citations in the text of the content and a Reference/Works Cited page.
- You must choose a chemistry-related topic and use at least 1 primary research article (not a review article, a news article, or an advertisement) as a source. You must use at least 2 sources in total.
- You should get your topic and primary research article approved by me by **T 10/20.**
- You have the opportunity to present your project during a Natural Sciences Poster Session on **W 12/2** at 4-6 PM. Participation in this event is an extra credit opportunity. If you choose to present, you can earn up to 6pts EC. PowerPoint presentations at the session require the students to bring their own laptop. If you chose to attend, but not present, you can earn up to 2pts EC, if you write a reflection paper due in class on **M 12/7**. Lastly, you can earn up to 10pts EC if you present your project to an audience (this is a competitive process and requires you to submit an abstract that is chosen among other submissions).

### **Writing Guidelines**

- A primary research journal article can be found in a peer-reviewed scientific journal. **Expect to spend time on this.** These research articles are not easy to read. I can also help you if you are having problems understanding your article.
- Both <http://www.chemistrycentral.com/> and <http://www.biomedcentral.com/> are open access databases for journal articles. Also, the Library has resources available, which will be discussed during a lab session. If you have trouble finding articles or if you would like confirmation that the article you found is appropriate, you can come talk to me.
- Plagiarism of any form will NOT be tolerated and will result in a grade of zero. Please refer to [www.plagiarism.org](http://www.plagiarism.org), the library, and the CAS Writing Lab for help. These sources are *highly* recommended. **Many students have received 0% because they did not fully understand what plagiarism is and unintentionally plagiarized.**
- You must include a references/works cited page and you must include references within the body of your paper.
- Within the body of the paper, you need parenthetical references, even if the material is paraphrased and not a direct quote (scientific paper style, not newspaper style). Use the MLA standards for in-text citations and the Works Cited, which can be located at the following website: [http://owl.english.purdue.edu/handouts/research/r\\_mla.html](http://owl.english.purdue.edu/handouts/research/r_mla.html). **Papers that do not include appropriate references pages, use of quotation marks, and in-text parenthetical citations (as appropriate) will result in a grade of zero.**
- Notes on some of the most common errors: Word-for-word sections must be in quotes with in-text citations; Paraphrased content must have in-text citations; Don't rely too much on direct quotations – paraphrasing lets me know that *you* know the information. Use your own sentence structure to avoid mosaic plagiarism.

*A Few Selected Examples from Papers:*

**Good:** Lowenstein explains, “calcium is essential to our body’s ability to function and our ability to think. The cardiovascular system and the nervous system both utilize calcium, and it’s also vital for blood clotting” (Lowenstein). Calcium is so crucial to the body, that without it, my cognitive-thought processing could possibly become impaired, and I wouldn’t even be able to write this paper. In fact, deprivation of proper calcium-intake can also result in hypocalcemia, tingling fingertips, muscle cramps, or osteoporosis (Timberlake, 126). **[Here, the student uses a word-for-word section and has it in quotes with an in-text citation. After that, she uses a paraphrased section with the in-text citation only].**

**Wrong:** Polycystic kidney disease is an inherited disorder in which multiple cysts develop that are noncancerous, and these cysts grow predominantly in a person's kidneys (“Polycystic Kidney Disease”). **[Here, the underlined section was taken word-for-word from the source, and has an in-text citation, but quotes are missing. This is plagiarism. The underlined section should be in quotes].**

**Wrong:** Naproxen is an aromatic compound containing two benzenes, a carboxylic acid, a hydrocarbon/methyl group, and somewhat of an ether group. The two benzenes are the 6-carbon rings bonded to each other, each carbon in the rings have a hydrogen atom attached to it. The carboxylic acid is on the right benzene containing COOH bonded to a CH. There is a methyl group, or hydrocarbon, bonded to the carbon in the carboxylic acid. On the left benzene ring, there is somewhat of an ether bonded to a carbon, the ether contains CH<sub>3</sub>O. Naproxen has a melting point of 153 degrees Celsius. It is insoluble in water and has a pH lower than 4. **[This is paraphrased, and some of it is based on the student’s knowledge gained from class, but it is either based on outside information or is not her original thoughts. The textbook should be referenced in an in-text citation for the functional groups and the last sentence should refer to an outside source. This is plagiarism].**

**Mosaic Plagiarism:**

The source says: “Adenoviruses force quiescent cells to re-enter the cell cycle to replicate their DNA, and for the most part, this is accomplished after they express the E1A protein immediately after infection.”

**Wrong:** Adenoviruses make sleeping cells restart the cell cycle to make new copies of their genetic material. This is done by making the protein E1A right away following infection (Dazard et al. 2011). **[Here the student has just popped in some synonyms, but has used the source’s sentence structure. This is mosaic plagiarism -- a mix of original and source writing. When you paraphrase, you need to use your own words and structure].**

**Good:** In order to increase the number of adenoviruses made by an infected cell, the adenovirus produces a protein called E1A (Dazard et al. 2011). This protein induces the host cells to enter into the cell cycle and start cell division (Dazard et al. 2011). This drives the cells to replicate the viral DNA, thus increasing the copies of viruses that can be made (Dazard et al. 2011).

***For all of these, there should be a Works Cited (references in MLA format).***

**Course Grading: (subject to change)**

<b>Chemistry 101 - Course Rubric</b>					
<b>Categories</b>	<b>Activity</b>	<b>Points per Units</b>	<b>Units</b>	<b>Total Points</b>	<b>Notes</b>
<b>Lecture (79%)</b>	Connect Plus Homework	10	14	120	Two Drops
	Quizzes	15	10	135	One Drop
	Hour Exam	80	4	320	No Drops
	Final Exam	215	1	215	No Drops
<b>Laboratory (18%)</b>	Lab Notebook/Report (including Pre- and Post-Lab Assignments)	12.5	8	87.5	One Drop
	Quizzes	5	10	45	One Drop
	1 <sup>st</sup> Formal Lab Report	15	1	15	No Drops
	Lab Assessment (includes the 2 <sup>nd</sup> Formal Lab Report)	32.5	1	32.5	No Drops
<b>Special Project (3%)</b>	Research Project	30	1	30	No Drops
<b>Extra Credit</b>	Course Orientation Quiz	1	1	1	Bonus
	Welcome Convocation	1	1	1	Bonus
	Science Talk	2	1	2	Bonus
	Chpt 1 Homework	3	1	3	Bonus
	Presentation at Poster Session	6	1	6	Bonus
	OR				
	Attendance at Poster Session (requires reflection paper)	2	1	2	Bonus
	OR				
Oral Presentation at Poster Session (competitive)	10	1	10	Bonus	
<b>Total Points</b>				<b>1000</b>	

**Course Grading Scale**

<b>Less than 60%</b>	<b>60%-69%</b>	<b>70%-79%</b>	<b>80%-89%</b>	<b>90%-100%</b>
<b>F</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>A</b>



**Course Schedule (subject to change):**

Lecture Schedule			Lab Schedule	
Date	Chapter	Topic	Date	Lab
<b>Week 1</b>				
			T 8/25	Safety and Introduction Chemical Foundations
T 8/25	8PM	Math Diagnostic Quiz		
W 8/26	10AM	Course Orientation Quiz (Bonus)		
W 8/26	2	Atomic Theory		
R 8/27	2	Atomic Theory		Pre-lab for density lab is due (in notebook)
R 8/27	8PM	HMWK bonus a: Chapter 1 HMWK bonus b: Chapter 1		
F 8/28	10AM	Quiz #1: Chapter 1		
Sun 8/30: Last day to withdraw for full refund				
<b>Week 2</b>				
			T 9/1	Density lab
W 9/2	3	Quantum Theory		
R 9/3	3	Quantum Theory		
Sat 9/5	8PM	HMWK #2a: Chapter 2 HMWK #2b: Chapter 2		
<b>Week 3</b>				
			T 9/8	Library Session <b>meet in R227</b> (Density lab due)
T 9/8	10AM	Quiz #2: Chapter 2		
W 9/9	3	Quantum Theory		
R 9/10	3 4	Quantum Theory Periodic Trends		Pre-lab for Visible Light Spectroscopy Lab is due (in notebook)
Sat 9/12	8PM	HMWK#3a: Chapter 3 HMWK#3b: Chapter 3		

<b>Week 4</b>				
			T 9/15	Visible Light Spectroscopy
T 9/15	10AM	Quiz #3: Chapter 3		
W 9/16	4	Periodic Trends		
R 9/17	5	Ionic & Covalent Bonding		
Sat 9/19	8PM	HMWK#4a: Chapter 4 HMWK#4b: Chapter 4		
<b>Week 5</b>				
M 9/21	1-4	<b>Exam 1</b>		
			T 9/22	<b>Exam 1</b>
W 9/23	5	Ionic & Covalent Bonding		
R 9/24	5 6	Ionic & Covalent Bonding Chemical Bonding I		
Sat 9/26	8PM	HMWK #5a: Chapter 5 HMWK #5a: Chapter 5		
<b>Week 6</b>				
			T 9/29	3D Printing (1 <sup>st</sup> Formal Lab Report) ( <i>Visible Light Spectroscopy due</i> )
T 9/29	10AM	Quiz #4: Chapter 5		
W 9/30	6	Chemical Bonding I		
R 10/1	6	Chemical Bonding I		
Sat 10/3	8PM	HMWK#6a: Chapter 6 HMWK#6b: Chapter 6		

<b>Week 7</b>				
			T 10/6	Molecular Geometry (3D printing 1 <sup>st</sup> formal lab report due) <b>meet in L242</b>
T 10/6	10AM	Quiz #5: Chapter 6		
W 10/7	7	Chemical Bonding II		
R 10/8	7	Chemical Bonding II		<i>Molecular Geometry due in lecture</i>
Sat 10/10	8 PM	HMWK#7a: Chapter 7 HMWK#7b: Chapter 7		
<b>Week 8</b>				
M 10/12	5-7	<b>Exam 2</b>		
			T 10/13	<b>Exam 2</b>
W 10/14	8	Stoichiometry		
R 10/15	8	Stoichiometry		
<b>Week 9</b>				
			T 10/20	Recycling Aluminum
<b>T 10/20</b>	<b>Get approval for special topic and primary article</b>			
	8	Stoichiometry		
W 10/21	9	Aqueous Reactions		
R 10/22	9	Aqueous Reactions		
Sat 10/24	8PM	HMWK #8a: Chapter 8 HMWK #8b: Chapter 8		
<b>Week 10</b>				
			T 10/27	Titration (Recycling Aluminum due)
T 10/27	10AM	Quiz #6: Chapter 8		
W 10/28	9	Aqueous Reactions		
R 10/29	9 10	Aqueous Reactions Thermochemistry		
Sat 10/31	8PM	HMWK #9a: Chapter 9 HMWK #9b: Chapter 9		

Week 11				
			T 11/3	Thermochemistry – Calorimetry ( <i>Titration due</i> )
T 11/3	10AM	Quiz #7: Chapter 9		
<b>W 11/4</b>	<b>Special Project is Due</b>			
W 11/4	10	Thermochemistry		
R 11/5	10 11	Thermochemistry Gases		
Sat 11/7	8PM	HMWK #10a: Chapter 10 HMWK #10b: Chapter 10		
Week 12				
			T 11/10	Gas Law (Lab Assessment and 2 <sup>nd</sup> Formal Lab Report) ( <i>Calorimetry Due</i> )
T 11/10	10AM	Quiz #8: Chapter 10		
W 11/11	11	Gases		
R 11/12	11 12	Gases Solids and Liquids		
Sat 11/14	8PM	HMWK #11a: Chapter 11 HMWK #11b: Chapter 11		
Week 13				
M 11/16	8 - 11	<b>Exam 3</b>		
			T 11/17	<b>Exam 3</b>
W 11/18	12	Solids and Liquids		
R 11/19	13 14	Colligative Properties Thermodynamics		
Sat 11/21	8PM	HMWK#12a: Chapter 12 HMWK#12b: Chapter 12 HMWK#13a: Chapter 13 HMWK#13b: Chapter 13		

Week 14				
			T 11/24	Chpt 14 Thermodynamics lecture in <b>L242</b> (Gases formal report due)
T 11/24	10AM	Quiz #9: Chapter 12		
W 11/25	15	Equilibrium		
R 11/26		<b>HOLIDAY</b>		
Week 15				
			T 12/1	Thermodynamics – Spontaneity (due at end of lab)
T 12/1	10AM	Quiz #10: Chapter 14		
W 12/2	<b>Natural Sciences Poster and Presentation Session (4-6PM)</b>			
W 12/2	15	Equilibrium		
R 12/3	15	Equilibrium		
F 12/4: Last day to withdraw from class				
Sat 12/5	8PM	HMWK #14a: Chapter 14 HMWK #14b: Chapter 14 HMWK #15a: Chapter 15 HMWK #15b: Chapter 15		
Week 16				
			T 12/8	Equilibrium – Le Chatelier's Principle (due at end of lab)
W 12/9	<b>12-15</b>	<b>Exam 4</b>		
R 12/10	<b>12-15</b>	<b>Exam 4</b>		
Finals Week				
R 12/17	<b>All Units</b>	<b>Final Cumulative Exam in L242 (room subject to change)</b>		

