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**CHEM 104: Integrated General Chemistry**

**Section 11, 20, 21:** Tuesday/Thursday 3:30 pm – 4:45 pm in KRB 204

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Instructional Team Information

**CHEM 104 Instructors**:

Name: Mark T. Baillie, Ph.D.

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Email: [baillie@udel.edu](mailto:baillie@udel.edu)

Office Hours: ***See Canvas for weekly hours***

*Also available by appointment*

**BISC 207 Instructors**:

Michael Moore, Ph.D. [mcmoore@udel.edu](mailto:mcmoore@udel.edu)

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**Preceptor:**

Anne Terrell [aterrell@udel.edu](mailto:aterrell@udel.edu)

Required Materials

*Note*: If you took iCHEM103 with Dr. Baillie in 15S, and purchased the 2 semester options, you don’t need to buy anything for this course.

1. Bundle of online homework, practice homework platform, and textbook (*see* Table 1 *for options*)
   1. Online access cards
      1. Sapling (online homework)
      2. SmartWork (practice resource – free from publisher with book purchase)
   2. Classroom Text: *Chemistry: The Science in Context* by Gilbert, T., Kirss, R., Foster, N., & Davies, G. book*.* 4th ed.
2. Moog, R. & Farrell, J. *CHEMISTRY*: A Guided Inquiry. 6th ed. Wiley, Hoboken, 2015. ISBN: 9781119921592.
3. i>Clicker2: You will **need** the **second-generation** iClicker device to earn credit as we utilize the numeric input feature that is *not possible* with the first generation clicker.
4. Safety Goggles (not glasses). Must be ANSI compliant.

Table 1: Homework and Book options. You will need to purchase ONE of the options (ISBN numbers) in this table. Please choose the package that best suits your needs.

|  |  |  |
| --- | --- | --- |
| **Sapling Homework & SmartWork** | **Gilbert Chemistry text** | **1 semester ISBN** |
| 2 Online Access Cards | **eBook** | 9780393571424 |
| 2 Online Access Cards | **Loose-leaf** print book & **eBook** | 9780393571448 |
| 2 Online Access Cards | **Paper back** print book & **eBook** | 9780393571400 |
| 2 Online Access Cards | **Hardcover** print book & **eBook** | 9780393571387 |

*\*note: the online only options can also be purchased* ***directly from Sapling*** *through the Canvas “Assignment” portal.*

*If you would like to* ***buy or rent******a copy*** *of the book in addition to the digital options, you will need to do this at one of the campus bookstores.*

Course Overview

Chemistry is a very diverse field and, at its most basic level, aims to understand the physical world that surrounds us. Chemistry is a *science*.Science uses systematic processes to observe, describe, explain, and predict physical and chemical phenomenon. During CHEM 103, you were equipped with the tools required to *speak the language* of chemistry. We explored broad applications of relevant areas of interest in this beloved discipline. During CHEM104, we will continue to establish ties between biological, medical, environmental, and societal applications of key chemical content areas that include chemical kinetics, equilibrium, energetics, and nuclear systems. Throughout this semester, we will ask ourselves 1) how fast does a process occur? 2) To what extent does that process proceed? 3) What energetic forces drive that process? One of the many salient features of chemistry is that its ubiquitous concepts are relevant to you personally, regardless of your major or eventual career path. As a member of this society, you are affected by historical theoretical developments just as much as modern advancements. My commitment to you is that our journey into the sub-microscopic world of electrons, atoms, and molecules influences you in a positive way and somehow shapes your overall perspective on your world. Welcome to your integrated experience.

How Does This Course Fit in the Bigger Picture of Your Education?

This introductory course was designed in consideration of the fundamental chemical principles that you will need to be successful in your scientific career. Specifically, we have made an effort to include biological relevance to core chemical principles. This is complimented by an emphasis on developing skills that you will use in any career you pursue, such as group work and presentation skills, self-reflection of your own learning and progression (metacognition), and critical thinking skills.

I have highlighted the goals that are most tied to the specific course objectives stated below.

UD General Education Goals

How does this course fit in the bigger picture of your education? This general course was designed with consideration of the fundamental chemical principles that you will need to be successful in your scientific career. We have made an effort to include biological relevance to core chemical principles within the framework established by UD. General education at UD prepares students who are able to:

1. Read critically, analyze arguments and information, and engage in constructive ideation.
2. Communicate effectively in writing, orally, and through creative expression.
3. Work collaboratively and independently within and across a variety of cultural contexts and a spectrum of differences.
4. Critically evaluate the ethical implications of what they say and do.
5. Reason quantitatively, computationally, and scientifically.

Example Course Learning Outcomes

Upon successful completion of this course, you should be able to apply knowledge gained from all readings, assignments, in-class exercises, workshop, studio and laboratory activities to big picture concepts as exemplified below.

1. Describe radiometric carbon dating and how it may be used to determine the age of a sample, including the techniques limitations and assumptions.
2. Extend colligative properties to biological systems such as the freezing point of an animal’s blood as a function of glucose or other solute concentrations.
3. Apply kinetic molecular theory and gas laws to predict coastal weather patterns.
4. Distinguish between equilibrium and non-equilibrium reaction conditions and identify how various influences may perturb the position of this state in your cell phone.
5. Consider the energetics, kinetics, and reversibility of blood and its buffering system. Sample regional streams to assess for various parameters of water quality to infer health risks and inform environmental decisions.
6. Collaborate with your peers on written communications of your scientific work.
7. Use your proficiency of the language of chemistry to disseminate your laboratory results to a broader audience including fellow students, faculty, and university staff.

Course Logistics

Course Management & Class Time

Please note that this course has [UD Capture](http://ats.udel.edu/udcapture/) enabled, which means that the audio and the screen presentations for every class period will be recorded. No one will be on camera. In addition, I have enabled [LiveMark](http://ats.udel.edu/livemark/) to help students with taking notes along with the recorded lectures.

Course *and* lab materials will be managed using [Canvas](http://www.udel.edu/canvas) (one site for lecture, one for lab). Through Canvas, you can access your Sapling Learning account, read announcements, access the links to UD Capture and LiveMark, download lecture handouts, access links to campus resources, read and post onto the discussion forums, and review your grades. Furthermore, your Syllabus Quiz will be available only on Canvas. It is your responsibility to check this website often so you are up-to-date on readings, assignments, and other course- and lab-related material.

It is my goal to create an interactive atmosphere during this class so I do expect that students be actively engaged in the class. During class, I will clarify and elaborate on the readings, introduce material not covered in the readings, support class discussions, and incorporate activities and demonstrations. I strongly recommend that you read the material for the week’s classes *prior* to attending class. **To help you with taking notes, I will post lecture handouts under “Files” on Canvas the night before each class.** During class, please feel free to raise your hand and let me know if you need me to repeat something, slow down, or if you have a relevant question that you think the rest of the class would also like to hear!

Some Expectations about Classroom Behavior

Please be courteous to your fellow classmates and me. This section is here in the syllabus to make it clear what I expect in terms of behavior during class time. Students violating these expectations are engaging in disrespectful behavior and may be asked to leave. Disruptive behavior serves only to impede both your own learning and the learning of your classmates.

* Avoid coming in late or leaving early. Pack up your belongings only after the class time has ended.
* Refrain from talking during class time when others are speaking. In a lecture hall filled with 150 students, even whispering is loud and very distracting.
* Be mindful of your use of technology in the class. *There is evidence that multitasking on a laptop lowers students’ grades by 10% and lowers the grades of peers that see a multitasking screen by 17% (*[*Sana, Weston, & Cepeda, 2013*](http://www.sciencedirect.com/science/article/pii/S0360131512002254?np=y)*). That is more than one full grade!* You may use technology in the classroom to look up material relevant to the class material, post questions on the discussion forums, use LiveMark, or to take notes. Do NOT text, go online shopping, use Pinterest, or anything else that is not relevant to class.
* Turn off or silence your cell phones or other electronic devices before entering the classroom. *There is evidence that the interruption of a ringing cell phone negatively affects note-taking efficacy and impairs test performance on the material that was interrupted (End, Worthman, Mathews, & Wetterau, 2010).*

Doing Well in This Course

There are a few things that you can do to improve your learning experience in this course:

* Regular attendance
  + Sometimes, things happen so if you do miss a class period, you have a few options.

1. Listen to the class period that you missed on UD Capture. The link to access UD Capture and LiveMark can be found on Canvas under “Resources”.
2. Make friends with your classmates! If you ever have to miss a class because there’s an emergency, you can nicely ask a new friend for a copy of his or her notes.

* Reading the chapter associated with the class period *before* attending class
* Suggested readings for the coming week will be linked on Canvas to a Google document.
* Additionally, the publisher of our textbook has provided resources that are available through Canvas, in Modules. Please see the interactive tools available there to gain access to visual summaries, flashcards, ChemTours (a great resource!), and additional questions and more.
* Active engagement during class time
* Push yourself to raise your hand to ask a question or contribute to discussion questions.
  + - Your efforts to stay involved in class discussions will pay off
* Print out or download the lecture notes *before* class so that you can take notes on the discussion of the topic and participate in class discussions/activities.
* Use LiveMark to help you indicate unclear points during lecture that need re-reviewing.
* Sit in the front of the lecture hall so you can avoid feeling disconnected or to avoid the distraction of other students’ computer screens.
* Participate in the discussion forums and twitter ([#UDChem](https://twitter.com/search?q=%23udchem&src=typd))
* Ask questions about course material sooner rather than later and have your peers or us help you! Your TAs and I will usually check the Canvas Discussion Board daily.
* Share how you can apply chemistry to what you’re learning in other classes, what you are reading in the news, and your everyday life. See our Twitter section below.
* Are we not covering a specific chemistry topic in which you are interested? Post a thought-provoking comment or question!
* Visit your Preceptor, TA or us during office hours (come introduce yourself to us!)
* You do not need to ask permission to come to our office hours! Just come on by during the scheduled days and times! You can find office hours on our Canvas home page.
* This is a very large course and we enjoy getting to know our students individually during these office hours! You are always welcome to discuss course material, broader questions about educational and career paths, or tips on studying. If you cannot make office hours and would like to schedule an appointment, please politely send an email request with your availability (e.g., Monday before class, Thursday after 11am).
* Watch this series of short videos on “How to Get the Most Out of Studying”

These videos address (with psychological research!) the common issues that some students have reported as challenges to their success in college science courses – [(1) misconceptions about learning](http://youtu.be/KFHAtBm_CCI), [(2) levels of processing information](http://youtu.be/pROdsokl9cU), [(3) developing effective studying strategies](http://youtu.be/9GvBJalFeLs), [(4) practicing effective studying](http://youtu.be/7pm214sVViQ), and [(5) what steps to take when students earn a bad exam grade](http://youtu.be/2WKhd0r_oqo).

Course Communication & Emails

I will post announcements, course material, and other important information on Canvas so it is important that students regularly check their UDel email and the course website regularly.

Email is the best way to reach me. Please know that responding to emails promptly is a priority for me. *However, in general, please* **allow 24 hours on weekdays and 48 hours on the weekends for responses to your emails***.* If you do not receive a reply within these time frames, it is safe to assume that I did not receive it and feel free to send me another email.

Because of convenience, email communication is generally very common between instructors and students. Thus, it is important to recognize the importance of email etiquette:

* *Include a proper greeting.*
  + “Hi Professor Baillie” is great! “Hey Baillie” is not.
* *Let me know which course section you are taking with me.*
  + I teach multiple courses and sections of this course so please **include the class name and section number either in the subject line or within the body of the email**. This will allow me to provide tailored responses to content specifically discussed during your section.
* *Tell me who you are.*
  + Consider the email like a traditional letter that you would write by hand and include a “signature” with your first and last name. I like to get to know my students and reply to your emails with proper greetings as well!
* *Check the syllabus before you email me a question.*
  + I try to be very thorough (as you can tell from the page count!!) when I create the syllabus and it will often answer most general questions about the course. **The syllabus is very wise.**
* *Post onto the Canvas Discussion Forums.*
  + I encourage students post their questions to the forums rather than sending me an email. In some cases, your fellow classmates may be able to help you out. In other cases, your classmates may have a similar question and everyone can benefit from a response to this question. Either your TA or I will regularly check this Discussion Board.
* *Be professional.*
  + Use complete words and sentences and check for errors in your email. Please do not use text-messaging abbreviations or send a series of emails as you think up questions. “Hey, when r u postin the study guide” is not appropriate. When you are composing an email, ask yourself if the tone is professional and respectful. Is this a message you would send to your boss at a job?
* *Multiple questions?*
  + If you have several questions, or require a very detailed answer, it may be difficult to respond in an email, so please visit office hours or schedule an appointment.

We are on Twitter!

If you would like to learn more about chemistry in the news and science at UD (seminars, events & opportunities), consider following [**@iChemUD**](https://twitter.com/iChemUD). Feel free to post articles or events that you think add to our understanding of chemistry in the context of the world around with [**#UDChem**](https://twitter.com/search?q=%23udchem&src=typd)! To decide if a tweet is *appropriate*, ask yourself if you think others in the class could benefit by your tweet. If not, maybe you should post to another hashtag that isn’t linked to our course.

Grading

You will have the opportunity to earn up to a total of 1000 points across the entire course. We go by a straightforward point system so to calculate your grade percentage, add up your total earned points and divide by the total possible points. Please note that your final course grade will NOT be rounded up so the percentage you earn needs to cross the bottom threshold of each of the letter grades in the grading scale below (e.g., a 89.98% earns you an A-).

|  |  |  |
| --- | --- | --- |
| **Course Component** | **Weighted Point Value** | **Percentage of Total Points** |
| i>Clicker2 Class Participation | 50 points | 5.00 % |
| Sapling Assignments | 70 points | 7.00 % |
| Sapling Quizzes | 50 points | 5.00 % |
| Workshop | 60 points | 6.00 % |
| Lab | 250 points | 25.00 % |
| Exams 1 - 4 (equally weighted) | 520 points | 52.00 % |

|  |  |  |  |
| --- | --- | --- | --- |
| A = 90.00-100% | | A- = 88.00-89.99% | |
| B+ = 84.00-87.99% | B = 78.00-83.99% | | B+ = 84.00-87.99% |
| C+ = 72.00-74.99% | C = 63.00-71.99% | | C+ = 72.00-74.99% |
| D+ = 56.00-58.99% | D = 53.00-55.99% | | D+ = 56.00-58.99% |
|  | F < 50.00% | |  |

Course Componenets

i>Clicker2 Class Participation

You must register your iClicker2 through Canvas immediately. To register your device, go to the lecture Canvas page for this course, click on the iClicker tab on the left side of the page, and enter the ID number from the back of your clicker in the registration box. After submitting, scroll down and make sure that you see your number has been registered on that same page. Bring your iClicker**2** to EVERY class period.

These in-class iClicker questions are meant to support and enhance your understanding of the course material and a good way for both you and me to gauge your level of understanding.

You must answer at least 75% of the questions presented on any given day in order to receive credit for participation (worth 1 point per day). In terms of credit, it will not matter if you get the questions incorrect – points are awarded just for participation. Students occasionally forget their clicker or miss class for a variety of reasons (excused or unexcused), you will only need to achieve 90% of the total points available to earn full credit on this component of the course. Hence, those few days of forgetfulness or illness will not impact the grade you can earn. There will be no chances to make-up missed iClicker questions. NO – you may not hand in a scrap piece of paper with your responses if you forget your clicker!

*It is important that you participate with only your own iClicker. If you participate in iClicker activities for someone else, this behavior is unacceptable and is considered academic dishonesty.*

Sapling:

Online Assignments

We have found that in order to master concepts in chemistry, you need to put in a substantial amount of time reading as well as **working through practice problems** (critical to learning). To accomplish this goal, we have devised specific homework problem sets on Sapling that will provide you an opportunity to work through the problem solving process. Sapling assignments have been set up as a form of practice; regardless of the number of attempts you need to complete a problem, you earn credit simply by **completing** the problem. You may find hints or tutorials helpful to complete a problem; feel free to use these resources as you wish. However, if you use the “Give Up” option, you will be able to see how to complete the problem, but will no longer be able to earn credit for that problem. These assignments will factor in to class discussions to introduce or elaborate on topics covered in this course. Even though this is a large class, you will be expected to participate in class discussions about these materials. It is never fun if we all sit in awkward silence! There will be no chances to make-up Sapling assignments. You must complete the homework by the due date or it will be marked down for every hour it is late (10% per hour).

Online Quizzes

Because your homework assignments are designed to give you ample time and opportunity to master the material without a point penalty for your attempts, you will have an assessment **the day after** each assignment is due. This online assessment will be available through Sapling and will reflect the problems that were on your assignment, but will be graded on the first attempt. The quiz will always occur on the day after the assignment is due and will be available from 6:00 AM – 11:55 PM. You can start the quiz anytime it is open but beware that you will have a specified and limited amount of time to complete the quiz (stated at the start of the quiz, typically anywhere from 15 to 30 minutes depending on the material). It is your responsibility to make sure that you have a stable internet connection (ideally hardwire through Ethernet cable) to minimize risk of disconnecting and losing time on the quiz. There will be no chances to make-up these quizzes.

Sapling **does NOT work on mobile devices** without flash, so please plan on using a computer for your quizzes.

SmartWork

You have access to an online homework platform tailored to your textbook. Assignments embedded herein are strictly optional but *highly* recommended for extra practice.

Workshop

Chemistry is a science of explaining observations in experimental data, which we use to predict future events. Hence, many of the concepts in chemistry are most easily understood by analyzing experimental data and identifying trends. Every week you will be responsible for attending workshop, a 1-hour highly active and engaging session led by an undergraduate peer facilitator. During Workshop, you will often be learning concepts before they are introduced in class, and other times refining your understanding of current course topics. You will receive credit for attending Workshop *and* being on task during the hour. Please use the Canvas site 15F iCHEM104 Workshop to select a time on Friday that you will commit to attending each week. You will have 3 different section times to choose between.

Lab

Refer to your lab syllabus for detailed information on labs. These labs will are designed to integrate equipment, concepts, and techniques from your chemistry and biology courses. We hope that you will sometimes find yourself unable to distinguish “chemistry lab” from “biology lab”! Due to the high dependence on group work in lab, there is a VERY strict attendance policy that we urge you to take special note of.

Exams

There will be a total of 4 exams (the 4th exam is given during finals week). **The first three exams are semi-cumulative and the fourth is fully cumulative**. Because of overarching theories and concepts that are applied to the different topics as we continue through the semester, there will be questions that incorporate previously learned material. It is important to note that not all of the material covered in class time will be in the textbook and we will not cover everything in the textbook during class time. However, any of the information presented in the assigned reading, class time, lab, workshop, and studio is fair game to be included in the exams.

“Never memorize something that you can look up.” – Albert Einstein

The questions on our exams will test for more than if you can memorize an equation. We want you to focus on **how to use equations**, and to be able to work with relationships between variables to predict what will happen. Hence, **you are allowed to bring a 3” x 5” notecard** to each exam with any *hand written* notes on it that you wish. You may use both sides of the notecard. You must put your name and ID# legibly on the notecard, and turn it in at the end of the exam.

Exam Policies:

Final Exam Replacement Policy:

If your final exam score is *higher* than the score on either your 1st, 2nd, or 3rd exams, the lowest of these 3 scores may be replaced by your final exam score. The final exam score will *not* be replaced in any situation. Please refer to the excused and unexcused absence policies described below for more information on missed exams.

Advanced Notice Excused Exam Policy:

Acceptable reasons for missing an exam include serious illness, family emergencies, or military duty. Athletic participation and religious holidays not listed in University calendars are also acceptable reasons but note that for these reasons to be valid, **advance written notification needs to be provided** to me by the **second week** of the semester. If you have an acceptable reason, provide appropriate documentation, and notified in the appropriate time frame, you may replace your missed exam score with the final exam score OR, if circumstances permit, take the exam at an alternate time / day.

Missed Exam Policy:

If you do **miss** an exam for an **unexpected** and acceptable reason, you will need to provide documentation (e.g., doctor’s note) and **contact me immediately** (within two days). If you have an acceptable reason, provide appropriate documentation, and notified me immediately, you may replace your missed exam score with the final exam score.

Unexcused Exam Policy:

If you do not provide an acceptable reason for missing an exam, provide appropriate documentation, and notified me immediately, you may only replace one missed exam score with the final exam score.

Language Dictionary Use During Exams:

The University's policy states that a language barrier does not constitute a "special needs/learning disability" case, so students in this situation are not referred to the DSS Office. The CHEM104 policy for language dictionary use on exams will be to approve INSPECTED PAPER language dictionaries. ELECTRONIC language dictionaries will NOT be allowed at any time.

Special Accommodations:

If you have a documented disability that may need certain accommodations, please contact the [Office of Disabilities Support Services (DSS)](http://www.udel.edu/DSS/) as soon as possible. I will do what I can to accommodate needs but certain requested accommodations (e.g., extended time exams at the DSS Center) require registration with the DSS. The DSS office is located at 119 Alison Hall, 240 Academy Street and their phone number is 302-831-4643.

Grading Disputes & Minimum Req. for Passing CHEM 104:

On occasion, a student may believe that they have earned a higher grade on an assignment than they actually received or may believe that there is more than one right answer to a multiple-choice question. If you believe that a review of grades of warranted, you must meet with me within one week of receiving the grade/score. If you dispute a lab grade, you must meet with your TA to address the specific issue. **After one week, your grade/score cannot be argued and is permanent.** Be aware that if you request a grade correction, your entire exam is subject to re-grading. This may result in a lower overall grade.

Minimum Requirements For Passing Chem104 Are:

* Successful completion of the laboratory section of CHEM104
  + See lab syllabus for details on requirements
* Completion of the Final Exam
* Achieving a passing grade in the entire course

*If any of these requirements are not met by the end of the semester, you will earn an “INCOMPLETE”*

*grade.*

* An “INCOMPLETE” grade in CHEM104 F15 converts to a grade of “F” on February 15th, 2016.
* If you are considering changing to a Listener status or Withdrawing from this class, you must make an appointment with your chemistry and biology professor immediately. These two courses are linked, and your decision to change status in either course has broad implications.

A Note On Academic Honesty:

All students at the University of Delaware are expected to be honest in their academic studies. You are presumably pursuing higher education in order to actually learn course content and demonstrate to both professors and yourself what you can do intellectually. By committing acts such as plagiarizing the words or ideas of another, cheating on an exam or assignment, or allowing or helping another student to do these things, you are cheapening your own educational experience.

You should familiarize yourself with the Code of Conduct at the University of Delaware, which outlines the standards of student behavior, including guidelines regarding academic honesty: <http://www.udel.edu/stuguide/13-14/code.html>. Because this expectation to read the Code of Conduct is explicitly written in this syllabus and stated verbally during class time, pleading ignorance will not be a valid excuse. If you are caught committing an act of academic dishonesty, the incident will be reported to the Office of Student Conduct.