

Chemistry 1406 Syllabus

North Lake Campus of Dallas College

INSTRUCTOR INFORMATION

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COURSE INFORMATION

Course Title: General, Organic and Biological Chemistry

Course Number: 1406

Section Number: 72201

Semester/Year: Spring 2023

Credit Hours: 4

Class Meeting Time/Location: inet

Certification Date: see Dallas College website

Last Day to Withdraw: see Dallas College website

COURSE PREREQUISITES

Developmental Mathematics 0305 or Developmental Mathematics 0310 or Developmental Mathematics 0098 or Developmental Mathematics 0099 or the equivalent. Developmental Reading 0093 or English as a Second Language (ESOL) 0044 or have met the Texas Success Initiative (TSI) standard in Reading.

COURSE DESCRIPTION

CHEM 1406 Introductory Chemistry I (Allied Health emphasis) This is a Texas Common Course Number.

This is a survey course introducing chemistry to allied health students. Topics may include inorganic, organic, biochemistry, food/physiological chemistry, environmental/consumer chemistry. Designed for allied health students and for students who are not science majors. Coordinating Board Academic Approval Number 40.0501.51 03 (3 Lec, 3 Lab.)

The online section of this class is essentially the same as the on campus section and only for students with excellent time management and organizational skills who are able to take responsibility for their learning process. Online courses are not easier or less work than courses on campus. Expect to put in more time since you will be figuring out many things on your own, especially in the lab.

Online students may NOT come to campus to perform labs, there is not space or personnel available to accommodate online students in the campus chemistry labs.

STUDENT LEARNING OUTCOMES

There is an additional Learning Objectives document in ecampus that you should print out. It is more detailed and helpful for exam study. It is under the Chapter Contents button.

1. Perform calculations related to topics included in Chemistry 1406.
 - a. Be able to express, interpret, and utilize relationships between variables.
 - b. Solve problems using complete, thorough setups with metric and SI units, significant figures, and dimensional analysis.
2. Describe the fundamental particles of matter; relate basic laws and theories to their behavior, utilize a systematic method of naming compounds and polyatomic ions.
3. Write and balance different types of chemical equations, and perform molar mass conversions.
4. Define energy and heats of reactions, and perform related calculations. Recognize the environmental issues related to energy.
5. Recognize the correlation between electronic structure and the organization of the periodic table. State the number of valence electrons for the representative elements.
6. Determine the relationship between pressure, volume, moles, and temperature of gases and perform related calculations. Describe the characteristics and behavior of gases, liquids and solids and the intermolecular forces that are involved with these states of matter.
7. State the Octet Rule and predict the charge of an ion. Name and write formulas for compounds.
8. Differentiate between ionic and molecular compounds, and draw Electron Dot structures for atoms. Draw Lewis structures for covalent compounds.
9. Define radioactivity, write nuclear reactions, and perform related calculations with half-lives. Recognize the environmental and medical impact of nuclear radiation.
10. Identify organic families of compounds, distinguish representations of organic compounds. Name organic compounds. Distinguish between conformational, structural and stereo isomers.
11. Identify carbohydrates by their molecular formula and functional groups. Draw Fischer projections of monosaccharides. Distinguish between D and L sugars, alpha and beta anomers. Recognize the source for the different blood types.

12. Define solution, and explain colligative properties and the process of osmosis. Describe the factors affecting solubility and perform calculations with concentration of solutions.
13. Distinguish between fat and oil and their properties and molecular structure. Draw a phospholipid bilayer.
14. Define equilibrium, write equilibrium expressions and perform related calculations, and apply Le Chatelier's principle. Describe the factors affecting reaction rates.
15. Define acids, bases, and buffers, differentiate between strong and weak acids/bases, and identify conjugate acid/base pairs. Perform pH calculations with acids, bases and buffers.
16. Draw general structure of an amino acid. Recognize the four levels of protein structure.
17. Understand what an enzyme is and how it works.
18. Identify nucleic acids, protein synthesis.

TEXAS CORE OBJECTIVES

The College defines essential knowledge and skills that students need to develop during their college experience. These general education competencies parallel the Texas Core Objectives for Student Learning. In this course, the activities you engage in will give you the opportunity to practice two or more of the following core competencies:

1. **Critical Thinking Skills** - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. **Communication Skills** - to include effective development, interpretation, and expression of ideas through written, oral, and visual communication
3. **Empirical and Quantitative Skills** - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
4. **Teamwork** - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
5. **Personal Responsibility** - to include the ability to connect choices, actions, and consequences to ethical decision-making
6. **Social Responsibility** - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

COURSE MATERIALS

Learning materials will be provided as part of the IncludedED program www.dcccd.edu/included)
If you opt-out of the IncludedED program, you are responsible for obtaining all your required learning materials by the first day of the class. ([Institutional Policies.](#))

- **Textbook:** “*General, Organic, and Biological Chemistry: An Integrated Approach*” 4th edition by Laura Frost and Todd Deal. Prentice Hall
- **Homework System:** Pearson’s Modified Mastering (titled “MyLab & Mastering” on the website.) Access to the homework is under the Homework button in ecampus.
- **Lab** – Online students must procure lab materials. See details in Appendix B for how to do this. The lab manual is available through ecampus. **The lab experiments were written by NLC faculty are copyrighted material and should not be altered or distributed. They should not be posted to any websites.**
- **Scientific calculator** – these can be purchased anywhere for as little as \$10. Make sure the calculator you use can do log functions and exponents.
- **Access to ecampus** – our class website contains many documents and information such as the lab manual, grades and due dates for exams and labs.

I encourage online students to find ONE lab partner. Look for a partner by posting to the discussion board or emailing the class (a link in the Tools button.) This way you can benefit by having a friend in the class to collaborate with. If you perform the labs with a partner you must still submit your own independent lab report. Yes, you may collaborate with your partner and your data will be the same. But answers to questions cannot be exactly alike. Put all answers in your own words. Otherwise this is plagiarism and will be dealt with as cheating as outlined in the Syllabus and Student Code of Conduct.

Copies of completed North Lake labs are available on the Internet at disreputable websites. Do not visit these sites or use those copies or upload your labs to these sites. In addition to dishonesty this is a copyright infringement.

I have discovered many cases of plagiarism. If you plagiarize it is very likely that I will discover your plagiarism. The penalty for plagiarism is extremely high: if you plagiarize you will receive an F in the course.

Plagiarism is not worth the risk.

GRADED WORK

Homework – 10%

Problems are assigned and graded. The “Homework” button contains your homework assignments through the Pearson website. **Late homework will worth 50% of the total points.** Due dates are in the Pearson website under the “Assignments” tab. No credit will be given for homework done after the last due date.

Lab – 35%

NOTE: YOU CANNOT PASS THIS COURSE WITH A FAILING LAB GRADE

On campus students will only need to provide safety goggles. All other materials and equipment will be provided on campus.

The online course uses a “wet” lab experience with actual chemicals and equipment since the American Chemical Society does not recognize virtual or simulated labs as valid lab experience.

Lab kits are Included. They are to be picked up in the North Lake Book Store:

North Lake campus, K Building, K-201

[5001 N. MacArthur Blvd.](#)

[Irving, TX 75038](#)

972-550-0509

972-550-7924 (fax)

[Email the North Lake store](#)

[Store Hours](#)

If you need your materials shipped you must do the following:

- Go to <https://www.bkstr.com/dallascollegestore/product/included-handling-43217-1>
- Pay the “handling” fee of \$12.50 to ship the item. When you check out to purchase this handling fee, you will enter your mailing address and choose the speed of shipping (price varies depending on speed chosen and where it is to be shipped).

The Included team recommends you use your school email address to make it easier for Follett to match your account properly, but it is not required as long as you put in correct contact information and answer the phone if Follett calls for clarification of the request.

Check your kit contents against the packing list AS SOON AS you get your lab kit. If there are any missing or broken item please fill out a case via this link [lab kit](#) A confirmation email will be generated. If you wait until the lab is due to find out you have a missing item it will be too late.

The online course is the same as our on campus course and will require just as much if not more effort to achieve success.

Lab experiments are due throughout the semester. These experiments will help to reinforce some of the concepts and theories that are studied. Every effort has been made to correlate the lab schedule to topics in the lecture schedule. However, due to the unique scheduling of each semester, these may not coincide exactly. This is not a problem as each lab is self-contained, meaning you can read the lab and understand everything that you need to in order to perform the lab. (In fact there is some pedagogy which claims that students learn concepts better when they are first introduced in the lab.)

The lab grade will be the average of all the Lab Report grades. The lab schedule is in ecampus under the Labs button. Late labs will drop by ten points for each day the reports are late.

Safety training will occur at the beginning of the semester. This is required by law. Safety Training consists of reading the documents in ecampus under the Labs Button. Students must take the Safety Agreement “test” in ecampus or their labs will not be graded.

NOTE for Financial Aid Students: *This Safety Agreement test must be taken before the certification date or you will not be certified in this class.*

Online students are encouraged (but it is not mandatory) to find **ONE** partner through emailing the class. You must email me the name of your lab partner and put their name on labs which you do together. This way you can benefit by having a friend in the class to collaborate with and also share the cost of the lab materials. I encourage communication between partners but each of you must turn in your own unique Lab Report. This means that while your data will be identical, any answers to questions or conclusions will be **IN YOUR OWN WORDS**. Your answers cannot be alike or even similar. Do not copy each other as this is plagiarism and will be dealt with as Academic Dishonesty. If you and your partner have the same answers this is plagiarism. Read the document on Plagiarism found under the Labs button so that you know what plagiarism is and do not do it.

Copies of completed North Lake College labs are available on the Internet at disreputable websites. Do not visit these sites or use those copies or upload your labs to these sites. In addition to dishonesty this is a copyright infringement.

I have discovered many cases of plagiarism. If you plagiarize it is very likely that I will discover your plagiarism. The penalty for plagiarism is extremely high: if you plagiarize you will receive an F in the course.

Plagiarism is not worth the risk.

Students will follow the experimental procedure outlined in the lab experiment document. All observations, data, and calculations (show work for full credit) should be typed on the Lab Report Sheet. Online students will upload finished reports to the Turnitin link for grading.

- Lab schedule – under the “Labs” button in ecampus and Syllabus
- Safety Training information – under the “Labs” button in ecampus
- Lab Manual – under the “Labs” button in ecampus. Each lab folder has the Lab which is a word document that introduces and outlines the experimental procedure.
- Equipment and Chemicals – Online students must refer to Appendix B of Syllabus to procure your lab materials. Campus students do not need anything other than goggles.

The following are guidelines for what is considered **ACADEMIC DISHONESTY** on Lab Reports. (See “Institutional Policies” section below.)

- **No falsification of data.** Do not “fudge” or “tweak” in any way in order to improve your results.
- **Do your own work.** No sharing of data, that is, you may not copy data from someone else or give someone else your data.
- **No plagiarism.** Students must submit their own independent Lab Reports and cannot use someone else’s report as your own. If you work with a partner your data may be

the same as your partners but you must answer questions, perform calculations, and write the conclusions on your own. Use your own words.

Quizzes – 10%

There is a quiz in eCampus which will cover the material in each chapter of the textbook. Read the chapter in the textbook, go through the power point in eCampus, then take the quiz. The power point and quiz will be under the “Chapter Contents” button in eCampus under the Chapter folder. The quizzes are due the same time as the exam due date. That is, they should be completed BEFORE you go to the testing center to take the exam.

Exams – 45%

Exams are multiple choice. Exams will be taken in the Testing Center or possibly at home using Respondus LockDown Browser. Detailed instructions on how to use this browser and how to take exams is in eCampus under “LockDown Browser” menu button. Students must fill out a test request form at [testing center](#) for an appointment.

Exams must be taken by the due date under the “Exams” button. You will log on to eCampus and click on the “**Exams**” button and select the exam. Exam scores will appear on eCampus immediately upon completion of the exam.

Students are NOT allowed to leave the exam area during a test and return to complete the test. If you leave, the test is over. Do **NOT** use websites or other additional information during the test other than what is provided as this constitutes Academic Dishonesty.

Exams must be taken during the scheduled times. Any student who misses a test deadline with an excused absence can only earn a maximum of 70% of the total points. Exams will be cumulative; however, they will focus on more recent material.

MAKE-UPS: For a missed exam with **an excused absence during the testing dates**, a make-up exam must be taken as soon as possible **at the discretion** of the instructor. Excused absences will **only** be offered for one of the following reasons: illness, death in family, official University business, or documented emergency.

There will be formulas and additional info provided on each exam. Refer to the **document under the Exams button** to see what will be provided.

As you study, refer to the **Learning Objectives** for each chapter. These Learning Objectives help you prepare for the exams and are located under the "Course Documents" button.

Submit requests for special accommodations to the Disability Services Office (A430, 972-273-3165.) Visit the [North Lake College Disability Services](#) for more information.

Final Grade

A = 90-100 B = 80-89 C = 70-79 D = 60-69 F = 0-59

Chapter Quizzes	10%
Homework	10%
Lab	35%
Five Exams	45%

Your grade can be calculated at any time using the formula below. This formula is the same one that I use. Do not ask me to calculate your grade since you can do it as well as me.

$$\text{Grade} = \text{Exam Ave} \times 0.45 + \text{Hmwk Ave} \times 0.1 + \text{Lab Ave} \times 0.35 + \text{quiz ave} \times 0.1$$

Do not ask for extra credit. Anyone who asks for extra credit risks having five points deducted on an exam. There is already extra credit in the homework as well as bonus questions on each exam. I have no idea what extra credit I would give you that would help you to learn the content of this course better than the credit I have already built into the course.

OTHER COURSE POLICIES

- No cell phones or beeping devices allowed. No open lap tops.
- Paper, pencil and calculator are required at all classes.
- Attendance for campus students is mandatory (but not graded.) Arrive on time so you do not disturb the class. You are encouraged to ask questions and participate. Students are responsible for all materials handed out and all announcements made during their absence regardless of the reason(s) of the absence.
- Excused absences will only be offered for one of the following reasons: illness, death in family, official University business, or documented emergency. For any excused absence written documentation is required. To obtain an excused absence, email me and submit documentation by the next class meeting.
- Distractive talking or any disorderly conduct is prohibited. Please be courteous of others. It is distracting to leave the classroom in the middle of the class time. If you leave to answer a text or go to the rest room, do not come back. If it is a true emergency you may return.
- Follow the Code of Student Conduct.
- Students are encouraged to go for Tutoring.

TUTORING CENTERS

Tutoring is available and you are encouraged to take advantage of this free resource. The centers feature tutors, software, videos, CDROM's, internet, models, places to study quietly, places for group work, and other materials to assist in science classes.

North Lake STEM Resource center (P333):

Schedule link: tinyurl.com/stemrc3

[DC tutoring](#) for online and face to face classes. The North Lake center is in L139.

The following is a check list to follow to succeed in this course:

1. Read the Chapter in the Textbook
2. Read/study the chapter power point found under the Chapter Contents button in ecampus.
3. Complete the chapter QUIZ found under the Chapter Contents button in ecampus (10% of class grade.)
4. Complete the HOMEWORK on the MyLab and Mastering website by the due date listed in the website under the "Assignments" tab (10 % of class grade.)
5. Complete the scheduled LAB work and submit the report by the due date (35% of grade.)
6. Refer to the Learning Objectives found in the Chapter Contents button. Make sure you have mastered these objectives before taking the exam. I suggest printing these out so that as **you study you can refer to them. These Learning Objectives will help you be well prepared for the exams.**
7. Go to your testing center and take the EXAM by the due date. (50% of grade.)

INSTITUTIONAL POLICIES

[Institutional Policies](#) include information about tutoring, Disabilities Services, class drop and repeat options, Title IX, and more.

Appendix A: Schedules

Last day to withdraw can be found on DC website. Due dates of exams, quizzes, homework, and labs for the current semester are given in e-campus and the Pearson homework website.

Chapter	Chapter Title
1	Chemistry Basics
2	Atoms and Radioactivity
3	Compounds
4	Intro to Organic Compounds
5	Chemical Reactions
6	Carbohydrates
7	State Changes, Solubility and Lipids
8	Solution Chemistry
9	Acids, Bases and Buffers
10	Proteins

Assignment (Lab/Exam)	Due Date
Read Syllabus	Jan 17
Lab Intro/safety training	18
Safety Test	19
Measurement and Significant Figures (Ch1)	23
Exam 1 Chapters 1,2	25
Chemical Nomenclature (Chap 3)	30
Molecular Models Labs I and II (Chap 4)	Feb 1
Exam 2 – Chapters 3,4	6
Chromatography of dyes	8
Saponification (Ch 7)	13
Exam 3 – Chapters 5,6,7	15
Colligative Properties (Ch 8)	20
Solutions, Electrolytes, and Conc (Ch 8)	22
Exam 4 – Chapters 8,9	27
Enzymes (Ch 10)	1
Exam 5 – Chapter 10	Mar 8

Appendix B: Online CHEM 1406 Lab Materials

Below is a list of supplies needed for your CHEM 1406 online lab. The IncludedED program will supply NLC1406 kit from Home Science Tools. If you have opted out of IncludedEd you need to order this kit yourself. **EVERYONE must order a balance and procure additional materials that are not in the lab kit. See below for more details.**

You may choose to work with ONE partner which will reduce the expense of your lab as well as make the lab more fun. One set of supplies is sufficient per lab group of two. At the end of the semester please consider donating any left-over supplies or chemicals that you no longer need or want. We will put them to good use or dispose of them responsibly. You must inform me of who your partner is.

If you have opted out of IncludedED you must order the North Lake College Chemistry 1406 Kit, SK-NLC1406, ~\$80 from the following website:

<https://www.homesciencetools.com/product/north-lake-college-chemistry-1406-kit/>

EVERYONE must order a balance and procure additional materials that are not in the lab kit. Please make sure you have all supplies by doing the following:

1. **Order a Balance**, ~\$10 from the following website: [Order Scale](#)
2. **Procure the following materials** – This is a list of materials that are also needed to perform these labs. The chemicals and materials on this list are available at grocery stores, drug stores, hardware stores, etc. You very likely already have many of these in your home and kitchen.
 - Ruler
 - Book
 - Olive oil 70 g
 - Cheesecloth
 - Rubber band
 - Egg white or other food
 - Nonfat dry milk
 - Ice cube molds- *pliable silicone molds are best but you can also use paper muffin cups*
 - Timer (phones all have these)
 - Empty plastic water or shampoo bottle
 - Salt, NaCl(s) – 100g
 - Sugar – 100g
 - Epsom Salts – less than 1tsp
 - Celery – 1 fresh stalk
 - Vinegar – 50 mL
 - Vegetable oil 5mL
 - Food coloring (red, blue, green, yellow)
 - Pencil
 - Aluminum foil or saran wrap
 - ¼ lb Raw liver (fresh or frozen, thawed) *or* 1 package yeast
 - Cutting board and knife (if using liver)
 - Distilled water
 - Microwave safe bowl with cover
 - Microwave oven
 - Large plate (like a dinner plate)

North Lake College Chemistry 1406 Kit, SK-NLC1406



- 250 & 600 ml glass beakers
- 250 ml Erlenmeyer flask
- wickless alcohol lamp and stand
(you'll need to provide [denatured alcohol](#) as fuel)
- 10 ml polypropylene graduated cylinder
- 100 ml polypropylene graduated cylinder
- 4 Test tubes, large 16x150 mm
- test tube stand
- test tube clamp
- 12" thermometer
- Funnel, plastic, 65 mm dia.
- tubing pinch clamp
- Tube, 2 pack, 5 mm glass, 3" long
- Tubing, 4.8 mm vinyl, 2' long
- Rubber stopper, #6.5, 2-hole
- Rubber stopper, #0, 1-hole
- pH papers
- Pipet (medicine dropper)
- Stirring rod, glass, 6" long
- copper II sulfate, CuSO_4 , 30g
- Sodium hydroxide, NaOH , 30g
- Molecular Model Set, Student
- Hydrogen peroxide, 30mL
- Weighing boats, polystyrene 10 pack
- Filter paper, 11cm, 10pack