

**Chemistry 1451
College Chemistry II
Spring 2016**

Instructor: Dr. Faith Yarberry
Office: Laney-Manion Annex – Rm 129
Phone: 501-852-2530
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Office Hours: MW 1:00-3:00 pm, R 9:30 – 11:00 am in Laney Annex 129

Course Information:

Lecture: Laney-Manion 102 – MWF 9:00-9:50
Text: *Chemistry A Molecular Approach* (3rd Ed.) by Tro

Lab: Laney-Manion 206 T – 10:50-1:30 CRN: 23365
Laney-Manion 206 T - 8:00-10:40 CRN: 27568
Text: Labs to be printed from Blackboard

Course Item	# Given	# Dropped	# Toward Grade	Points per Item	Total Points
Lab	12	1	11	15	165
In-Class Quizzes	?	?	7	5	35
Assignments	?	?	10	5	50
Service-Learning	1	0	1	100	100
Exams	4	1	3	150	450
Final Exam	1	0	1	200	200
Total					1000

Grades: A: 900 - 1000 points B: 800-890 C: 700-790 D: 600-690 F: < 600

The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the UCA Office of Disability Services, 450-3613.

I do not offer make-up times for any course material. Missed laboratories, assignments, and exams will be dropped up to the allotted number described above. I do not accept late assignments. Do NOT ask to reschedule the final exam it WILL NOT happen. In the case of illness, please talk to me as soon as possible for any consideration to be given.

Any grade disputes must be discussed within 2 business days with the instructor.

Course Description	College Chemistry II is a required course for chemistry, biology, chemical physics majors, and medical pre-professional tracks. More advanced principles of general chemistry are treated with emphasis on theoretical and quantitative applications.
Prerequisites	The prerequisite for this course is a C or better in CHEM 1450 (College Chemistry I)
Materials Required	Graphing Calculator Mastering Chemistry Access Goggles Textbook Printed Laboratories (On Blackboard) Signed Safety Agreement Informed Consent Form(s) Service-Learning Agreements (2 forms)
Course Objectives	<p>Upon completion of this course, the student should have gained:</p> <ul style="list-style-type: none"> • An understanding of intermolecular forces, their impact on a substances physical properties, and their impact in solution formation • The ability to perform calculations using a variety of concentration units • An understanding of colligative properties and calculations involving colligative properties • An understanding of rate laws, the ability to determine rate laws, and the ability to perform calculations involving integrated rate laws • A working knowledge of equilibrium and LeChatlier's principle • The ability to calculate the pH of solutions containing strong acids, weak acids, strong bases, weak bases, and buffers • An understanding of the solubility constant and the ability to perform calculations containing the solubility constant • The ability to determine whether a reaction occurs in the manner described and perform calculations to confirm that understanding • The ability to work with Redox reactions as part of electrochemistry • A basic understanding of radioactivity and nuclear reactions
Attendance	<p>Each class meeting is important to the course development. Class begins at 9:00 am and ends at 9:50 am. Roll will be taken. 6 unexcused absences may result in a WP or WF grade at the instructor's discretion. It is the responsibility of the student to obtain any information covered during their absence.</p> <p>Attendance in the laboratory is mandatory. More the two absences WILL result in the student being dropped from the course with a WP or WF at the discretion of the instructor.</p>
Homework	A list of Homework problems can be found on Blackboard for each chapter. These problems <u>will not</u> be graded; however your success on timed exams will improve by completion of these homework problems. We will be working on these problems during class time, so bring your textbook to class.

Assignments Mastering Chemistry assignments containing 2 questions will be assigned periodically throughout the semester. The assignment will consist of questions over concepts discussed during the previous class. The instructor will try to announce when they are posted during class, but it is the student's responsibility to check the Mastering Chemistry website regularly. Assignments will be due before the start of the lecture after being posted. Assignments will not be accepted late.

In-class Quiz Quizzes will be administered periodically throughout the semester at the start of a class following announcements. Students will be given 5 minutes to complete the quiz. The quiz will cover material discussed in the previous lecture and will reflect how questions will be presented on an examination.

Exams 4-50 min exams will be administered on the dates listed in the syllabus beginning at 9:00 am. The final exam will be held April 27th from 2:00-4:00 pm. Plan your schedule accordingly because make-up exams will NOT be offered. Missed exams will be dropped up to the allotted number.

Laboratory Grade - Laboratory experiments will constitute 165 points of your grade. Each lab will be graded out of 15 points. (Lab Lectures count as a single lab grade of 15 points)

Laboratory Grade	Points	When Due
Teamwork	3	Evaluated by the instructor and teaching assistant
Data / Results	5	Friday following the lab
Post-Laboratory	5	Friday following the lab
Safety	2	Throughout lab the First safety violation receives a warning, the second safety violation you will lose 2 points. A third violation and you will be told to leave the lab.
Total	15	

Teamwork Chemistry is an experimental science. Lab time is your chance to master some of the experimental aspects of the subject. You will work in groups in the lab, but you will still be expected to actively participate in the experiments. Passive observation in lab while your partners do the work is unacceptable and will cost you up to 3 points of your teamwork points. Teamwork points will be determined by the TA and your instructor.

Each group will consist of three to four roles. These roles will be assigned at the start of each lab. If your group consists of only three members, the Scribe and Mathematician roles will be combined. The roles are:

Leader – Keeps the group on track, understands the background.

Lab Tech – Knows the procedure in advance, leads the group through the procedure.

Scribe – Records all information on the data/results and post laboratory sheets

Mathematician - Makes sure all recorded values are to the correct number of significant figures.

Your participation will be graded on the efficiency by which you carried out your role, whether you participated in completing the experiment and whether you helped in the completion of the calculations on the data/results sheet.

Data/Results Your data must be recorded to the correct number of significant digits. Your results will be graded for correctness in calculations, the correct number of significant digits, and for accuracy.

Post Lab Your post-laboratory will be graded for thoughtful answers based on your data/results and for correctness. One data and results sheet will be turned in for each group on the Friday after completion of the lab.

Safety Safety is Mandatory. You will not be allowed to enter the lab without closed toe shoes and goggles. You will be warned upon your first safety violation. A second violation will result in the loss of 2 points. The third violation will result in you being required to leave the lab for that day and receiving a zero for that lab.

Safety Agreement Before being permitted into the first lab, you must complete the safety agreement at uca.edu/web/forms/view.php?id=353

Service Learning Project:

Service-Learning Project This course contains a Service-Learning component. The Service-Learning component will be a 5-6-person group project. The Service-Learning Project will involve participation in the development of a hands-on chemistry activity and presentation of that activity at a Science Night scheduled by the College of Natural Science and Mathematics. Completion of the project will constitute 100 points of your grade.

Objectives Students will: (1) learn to work in teams, (2) think critically about scientific information, (3) learn to orally communicate scientific concepts to a broad audience, (4) learn about the importance of UCA's and their personal engagement in the community, and (5) learn how to write up a scientific procedure.

Process

The group will:

- Consist of 5-6 students
- Decide on a hands-on activity to present to the public
- Communicate the names of the group members and the activity to the instructor via email for approval
- Meet with the instructor on one occasion (described below).
- Present their hands-on at a Science Night (each group must be represented at each science night).
- Submit a write-up over their activity.
- Evaluate their participation and the participation of the other members of their group.

Pseudoscience Fair Grade:

Email communication	5
Meeting with Instructor	10
Quality Communication at Science Night	40
Paper	25
Self-Evaluation	15
Member Evaluation (Participation)	10
Total	100

Description of Grade

The group will:

- **Email Communication**
Students will establish their group and determine a topic. The names of the group members and topic must be emailed to the instructor by Jan 29th for approval. The first group to email the instructor regarding a specific hands-on activity will receive approval of that activity assuming it is reasonable for a Science Night. If denied approval, the group will need to edit according to the instructors comments.
- **Meeting with Instructor**
You will be required to give a list o materials needed to accomplish the hands-on activity to the instructor during this meeting. Additionally, you will be required to correctly explain the science behind the activity to the instructor.
- **Quality Communication at Science Night**
10 pts - attend
10 points – explaining the science behind the activity
20 pts – a quality, age-appropriate explanation of the science behind the activity
-10 points off for all group members if the group is not represented at all science nights
- **Paper**
The paper must have an objective, materials list, procedure, safety considerations, and scientific explanation. Your grade will be determined on the quality of the paper and its science.
- **Self-Evaluation**
5 pts – completion
10 potints – thoughtful completion
- **Member Evaluation**
0 points if your group member and instructor determines that you did not participate
2-10 points depending on your degree of activity within the group as indicated by the other members’ evaluation and the instructor’s evaluation.

Pseudoscience Fair Calendar:

Date	Location	Time
Jan 29	Email Communication Due	
Feb 5-10	Meeting with the Instructor	
Feb 15	Group must gather materials from instructor	
Feb 16	Science Night – Mayflower Elementary	
Feb 25	Science Night – Nemo Vista	
Mar 16	Science Night – St. Joseph	
Mar 30	Paper Due	9:00 am
Mar 30	Member Evaluation Due	9:00 am
Mar 30	Self-Evaluation Due	9:00 am

General Information:

Office Hours

This time is specifically set aside for you to ask me questions and receive help on course material. Use this time! **If you cannot make the scheduled times, make other arrangements with me.**

Academic

The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared

Integrity

responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

The penalty for academic dishonesty on an exam in this course is that the student will receive a zero for that exam and the exam grade will be counted into their final average

Emergency Procedures Summary

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at <http://uca.edu/mysafety/bep/>. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.

Title IX Disclosure

If a student discloses an act of sexual harassment, discrimination, assault, or other sexual misconduct to a faculty member (as it relates to "student-on-student" or "employee-on-student"), the faculty member cannot maintain complete confidentiality and is required to report the act and may be required to reveal the names of the parties involved. Any allegations made by a student may or may not trigger an investigation. Each situation differs and the obligation to conduct an investigation will depend on those specific set of circumstances. The determination to conduct an investigation will be made by the Title IX Coordinator. For further information, please visit: <https://uca.edu/titleix>. **Disclosure of sexual misconduct by a third party who is not a student and/or employee is also required if the misconduct occurs when the third party is a participant in a university-sponsored program, event, or activity.*

Other Policies

Information concerning University Academic Policies (such as the Sexual Harassment Policy and Academic Policies) can be found in the Student Handbook. Students should familiarize themselves with all policies listed in the Student Handbook at <http://uca.edu/ubulletin2015/general-policies-information> .

Tentative Schedule (Lab and Exam Dates will NOT Change)

Date	Topic	Lab Due
Jan 8	Syllabus	
11	Liquids, Solids, and Intermolecular Forces	
12	Graphing Lab	
13	Liquids, Solids, and Intermolecular Forces	
<i>13</i>	<i>Last Day to Change Your Schedule for the Spring Semester</i>	
15	Liquids, Solids, and Intermolecular Forces	Graphing
<i>18</i>	<i>Martin Luther King Day – No Class</i>	
19	Aspirin	
20	Solutions	
22	Solutions	Aspirin
25	Solutions	
26	No Lab	
27	Solutions	
29	Solutions	
Feb 1	Chemical Kinetics	
2	Lab Lecture	
3	Exam 1	
5	Chemical Kinetics	
8	Chemical Kinetics	
9	Sugar Density	
10	Chemical Kinetics	
12	Chemical Equilibrium	Sugar
15	Chemical Equilibrium	
16	Kinetics	
17	Chemical Equilibrium	
19	Chemical Equilibrium	Kinetics
22	Acids and Bases	
23	K_{eq} Spectral Determination	
24	Exam 2	
26	Acids and Bases	K _{eq}
29	Acids and Bases	
Mar 1	Le Chatlier's	
2	Acids and Bases	
4	Aqueous Ionic Equilibrium	LeChatlier's
7	Aqueous Ionic Equilibrium	
8	Weak Acid	
9	Aqueous Ionic Equilibrium	
11	Aqueous Ionic Equilibrium	Weak Acid
14	Aqueous Ionic Equilibrium	
<i>17</i>	<i>No Lab</i>	
16	No Class - Study	
18	Exam 3	
<i>18</i>	<i>Final Date to withdraw with a W grade</i>	
<i>21-25</i>	<i>Spring Break – No Classes or Lab</i>	
28	Free Energy and Thermodynamics	
29	Buffer	
30	Free Energy and Thermodynamics	

Apr 1	Free Energy and Thermodynamics	Buffer
4	Free Energy and Thermodynamics	
5	K_{sp}	
6	Free Energy and Thermodynamics	
8	Electrochemistry	K _{sp}
11	Electrochemistry	
12	KNO₃ and Thermodynamics	
13	Electrochemistry	
15	Electrochemistry	KNO ₃
15	<i>Final Date to withdraw with a WP/WF grade</i>	
18	Exam 4	
19	Electrochemistry Lab	
20	Nuclear	Electrochem
22	<i>Study Day – No Class</i>	
27	Final Exam: 2:00 pm – 4:00 pm	

Technology Instructions

Laboratory Safety Agreement – required for admittance to first lab

Go to <https://uca.edu/web/forms/view.php?id=353>

Complete the Form

Blackboard – contains PowerPoints, Videos, Optional Homework, Syllabus, Evaluation forms, etc.

Log into your MyUCA account

Click on the My Courses tab

Click on College Chemistry II

Mastering Chemistry – Assignments and Math Quizzes

www.masteringchemistry.com

Click on student under register now

Select US

Click – Yes, I have a CourseID

Type in Yarberry1451S2016

Click – Yes, I have an Access Code (Purchased from the Bookstore)

Click – I agree

Fill out remainder of information with your purchased Access Code

Opportunities for Bonus Points (You can earn up to 30 point maximum.)

Opportunity	Attendance	Evaluation
Chalk Talk	5	
Chalk Talk	5	
Chalk Talk	5	
Seminar – Laney 104, Jan 29 th , 2:00 (be polite or 0)	5	
Seminar – Laney 104, Feb 5 th , 2:00 (be polite or 0)	5	
Seminar – Laney 104, Feb 12 th , 2:00 (be polite or 0)	5	
Seminar – Laney 104, Feb 19 th , 2:00 (be polite or 0)	5	
Seminar – Laney 104, Mar 11 th , 2:00 (be polite or 0)	5	
Seminar – Laney 104, Mar 31 st , X-period (be polite or 0)	5	
MapWorks Completed (show print-out or screen shot of completion screen)	5	
Map-Works Evaluation (Found under Course Bonus folder in Blackboard)		10
Lecturer Position Evaluation (Found on Blackboard)		10
Additional Science Night	10	
Additional Science Night	10	
Additional Science Night	10	

Attendance Points – Sign in with Dr. Yarberry and be attentive.

MapWorks Evaluation and Guest Lecturer Evaluation– Complete the form available on Blackboard

Lab	
Graphing	_____/15
Aspirin	_____/15
Lecture	_____/15
Sugar	_____/15
Kinetics	_____/15
Keq	_____/15
LeChatlier's	_____/15
Weak Acid	_____/15
Buffer	_____/15
Ksp	_____/15
Thermo	_____/15
Electrochem	_____/15

Service-Learning	
Email	_____/5
2 nd Meeting	_____/10
Science Night	_____/40
Paper	_____/25
Self Eval	_____/15
Member Eval	_____/10

In-Class Quiz	
Quiz 1	_____/5
Quiz 2	_____/5
Quiz 3	_____/5
Quiz 4	_____/5
Quiz 5	_____/5
Quiz 6	_____/5
Quiz 7	_____/5
Quiz 8	_____/5
Quiz 9	_____/5
Quiz 10	_____/5
Quiz 11	_____/5
Quiz 12	_____/5
Quiz 13	_____/5

Exams	
Exam 1	_____/150
Exam 2	_____/150
Exam 3	_____/150
Exam 4	_____/150

Assignments	
Assignment 1	_____/5
Assignment 2	_____/5
Assignment 3	_____/5
Assignment 4	_____/5
Assignment 5	_____/5
Assignment 6	_____/5
Assignment 7	_____/5
Assignment 8	_____/5
Assignment 9	_____/5
Assignment 10	_____/5
Assignment 11	_____/5
Assignment 12	_____/5
Assignment 13	_____/5
Assignment 14	_____/5
Assignment 15	_____/5

Bonus	

Course Item	# Given	# Dropped	# Toward Grade	Points per Item	Total Points
Lab	12	1	11	15	165
In-Class Quizzes	?	?	7	5	35
Assignments	?	?	10	5	50
Service-Learning	1	0	1	100	100
Exams	4	1	3	150	450
Final Exam	1	0	1	200	200
Total					1000

To determine what you need to make on your final exam:

- A. Sum of Top 11 Lab Grades _____
- B. Sum of Top 3 Exam Grades _____
- C. Sum of Service Learning _____
- D. Sum of Top 7 In-Class Quiz Grades _____
- E. Sum of Top 10 Assignment Grades _____
- F. Bonus (up to 30 points) _____
- G. Total Sum A – F above** _____

For an A on your transcript, the following equation indicates the number of points you need on your final exam.

$$900 - G = \underline{\hspace{2cm}}$$

For a B on your transcript, the following equation indicates the number of points you need on your final exam.

$$800 - G = \underline{\hspace{2cm}}$$

For a C on your transcript, the following equation indicates the number of points you need on your final exam.

$$700 - G = \underline{\hspace{2cm}}$$

For a D on your transcript, the following equation indicates the number of points you need on your final exam.

$$600 - G = \underline{\hspace{2cm}}$$

**University of Central Arkansas
Informed Consent Agreement**

Development and Implementation of Algebraic/Chemistry Online Tutorial

You are being asked to participate in a research study. Before you give your consent to volunteer, it is important you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

Investigators

Faith Yarberry, Ph.D.
Department of Chemistry
University of Central Arkansas
Laney 205
Conway, AR 72035
501-852-2530

Lisa Christman, M.S.
University College
University of Central Arkansas
Main Hall 29B
Conway, AR 72035
501-450-3220

Purpose of the Research

This research study is designed to determine the effectiveness of a new Algebraic/Chemistry Online Tutorial.

The data from this research will be used to develop and improve new video tutorials that help students connect mathematical concepts learned in previous classes to those utilized in freshman-level chemistry classes.

Procedures

As part of the course you will be required to watch multiple videos illustrating mathematical and chemical concepts throughout the semester and complete a Math Quiz related to the video. If you volunteer to participate in this study, the results of your quiz and exam grades will be compared to grades obtained from a control group under the same instructor during previous semesters.

Your participation will take approximately one hour three times during the semester.

The Algebraic/Chemistry Online Tutorial is experimental. It is believed that, due to the method of presentation, it will benefit the students at comprehending mathematical and scientific concepts.

Potential Risks or Discomforts

There are no foreseeable risks associated with the study.

Potential Benefits of the Research

We expect that your grades, on mathematical concepts, to be higher than your predecessors scores in College Chemistry.

We believe that this research will benefit future chemistry students at the university and 9th-12th grade levels in the secondary education system as the Algebraic/Chemistry Online Tutorial is expanded to other sections of the course, other universities, and into the high school classrooms.

Confidentiality and Data Storage

Copies of each exam given throughout the semester will be photocopied and identification markers removed. The investigators will compare exam questions between the control group and the test group. Semester grades will be compared between the control group and the test group, but again all identification markers will be removed before the investigators work begins.

The data, used in the research, will be stored in Dr. Faith Yarberry's laboratory for 3+ years in a locked filing cabinet. Dr. Yarberry will be the only individual with access to the data when not being analyzed.

Participation and Withdrawal

Your participation in this research study is voluntary. You may refuse to participate without penalty. If you decide to participate, you are free to stop at any time without penalty by just stopping and/or telling the investigator.

You may not withdraw from the study after data collection has been completed since your name is not linked to the data.

Questions about the Research

If you have any questions about the research, please ask them now. If you have questions later, you may contact . . . Dr. Faith Yarberry (501-852-2530) or Lisa Christman (501-450-3220).

This research project has been reviewed and approved by the Institutional Review Board for the Protection of Human Subjects at the University of Central Arkansas. If you believe there is any infringement upon your rights as a research subject, you may contact the Research Compliance Coordinator at (501) 450-3451.

Subject's Agreement

I have read the information provided above. My signature below indicates my voluntary agreement to participate in this research study. Please return one copy of this consent form and keep one copy for your records.

Signature of Research Subject

Date

Signature of Investigator (optional)

Date

**University of Central Arkansas
Informed Consent Agreement**

Flipped Classroom Model

You are being asked to participate in a research study. Before you give your consent to volunteer, it is important you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

Investigators

Faith Yarberry, Ph.D.
Department of Chemistry
University of Central Arkansas
Laney 205
Conway, AR 72035
501-852-2530

Purpose of the Research

This research study is designed to determine the effectiveness of a Flipped Chemistry Classroom Model.

The data from this research will be used to develop and improve the classroom experience to enhance students understanding of concepts presented in the freshman-level chemistry classes.

Procedures

As part of the course you will be required to watch a portion of the courses chemistry lecture prior to attending class. During the class you will participate in activities designed to improve your understanding of chemical concepts. If you volunteer to participate in this study, your success on quizzes and exams will be compared to grades obtained from a control group under the same instructor during previous semesters.

Your participation should not require additional time then already expected of a student in a first-year chemistry course.

It is believed that, due to the method of presentation, students will develop a stronger foundation of scientific concepts associated with the course.

Potential Risks or Discomforts

There are no foreseeable risks associated with the study.

Potential Benefits of the Research

We expect that your grades will be higher than your predecessor's scores in College Chemistry.

We believe that this research will benefit future chemistry students at the university and 9th-12th grade levels in the secondary education system as the style of course will be expanded to other

sections of the course, other universities, and into the high school classrooms.

Confidentiality and Data Storage

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Signature of Research Subject

Date

Signature of Investigator (optional)

Date