



# CAMPBELLSVILLE UNIVERSITY

## COURSE SYLLABUS

PLEASE TYPE.

DATE 20 December 2016

ACADEMIC UNIT Natural Science Division FACULTY Elizabeth K. Sutton

Discipline	Course # and Section	Title of Course	Credit Hours	Cross Reference (if applicable)
CHE	113-91	General Chemistry I Lab	1	n/a

TEXTBOOK  Required  Not Required

Author Beran, Jo Allen Title "Laboratory Manual for Principles of General Chemistry", 10<sup>th</sup> ed.

Publisher John Wiley & Sons Publishing Date of Publication 2013

WORKBOOK  Required  Not Required

Author \_\_\_\_\_ Title \_\_\_\_\_

Publisher \_\_\_\_\_ Date of Publication \_\_\_\_\_

PLEASE ANSWER THE FOLLOWING QUESTIONS ON A SEPARATE SHEET OF PAPER AND ATTACH TO THIS FORM.

- DESCRIPTION OF COURSE: Develop a brief description of the course as it will appear in the Catalog.
- STUDENT LEARNING OBJECTIVES: List the student learning objectives for the course. Please relate these objectives to the mission and goals of the University and the Academic Unit. For general education courses, please indicate which student learning objectives address general education goals and the intended method of assessment. A minimum of four of the seven general education goals must be included.

*Example: Students will demonstrate their ability to compare and contrast two types of basket weaving. (Goal: Oral and Written Communication; Evidence: research paper and class presentation)*

- COURSE OUTLINE: Outline the topics/units that are to be taught.
- EVALUATION: How do you plan to determine the grade in the course? Please include grading scale.
- REQUIREMENTS:
  - Examinations: State when tests are to be administered, including unit, mid-term, and final examinations.
  - Reports: How many, length required, and what type (Oral, term and/or research, book critiques).
  - Supplemental reading assignments or outside work required.
  - Supplemental instruction aids: Audio visual aids, field trips, guest speakers, etc.

6. BOOKLIST

DEAN Date Copy Received \_\_\_\_\_

VICE PRESIDENT FOR ACADEMIC AFFAIRS Date Copy Received \_\_\_\_\_



I. **TITLE:** CHE 113 General Chemistry Laboratory I, one credit hour

II. **COURSE DESCRIPTION:** This laboratory course is an introductory course for chemistry majors and minors. **One three-hour laboratory period per week. Prerequisites:** CHE 111 must be taken concurrently.

III. **COURSE OBJECTIVES**

- A. **General Education Curriculum Objectives (GECO):** (numbered to correspond to the listing in the University catalog)
2. Critical Thinking: Students will demonstrate the ability to reflect on theories and issues in a systematic fashion.
  4. Ethics: Students will demonstrate an understanding of Christian values and ethical standards in order to make mature and informed decisions concerning moral issues.
  5. Oral and Written Communication: Students will demonstrate the ability to express ideas, beliefs, and information in an organized, precise, and persuasive manner.
  6. Quantitative Literacy: Students will demonstrate the ability to understand and utilize mathematical and/or logical relationships to analyze data, to construct and assess arguments, and to make sound judgments in quantitative situations that arise in daily life.
- B. **Student Learning Outcomes (SLO):** Students will (numbered to correspond to the pertinent General Education Curriculum Objective [GECO])
1. Students will specifically demonstrate laboratory and safety techniques that are related to basic chemistry and chemical samples. (GECO 6; Evidence: quizzes, weekly labs)
  2. Students will develop skills to critically analyze the validity of experimental data. (GECO 4, 6; Evidence: lab reports)
  3. Students should comprehend and use basic chemical principles, terminology, and the uses of scientific technology and their implications. (GECO 6; Evidence: quizzes, lab reports)
  4. Students will recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing. (GECO 2,5; Evidence: lab reports)
  5. Students will follow ethical practices when conducting research, writing reports, using sources and when working with others. (GECO 4; Evidence: quizzes, lab reports)
  6. Students will demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies. (GECO 4,6; Evidence: quizzes, lab reports, class discussion)
  7. Students will demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture. (GECO 4,6; Evidence: lab reports)
- C. **Program Learning Outcomes (PLO):** (numbered to correspond to the program learning outcomes listed in the program assessment document)
1. The student will be able to demonstrate a solid understanding of the core principles in the traditional subdivisions of chemistry: Analytical, Inorganic, Organic and Physical.
  2. The student will be able to perform qualitative/quantitative chemical analyses/syntheses through the use of the appropriate laboratory techniques/equipment, experimental design, data acquisition, interpretation of data, and relevant instrumentation.
  4. The student will be able to articulate chemical information/data/ideas clearly and effectively in speech and in writing in an acceptable presentation format.
  5. The student will demonstrate a fundamental knowledge of chemical safety, chemical hazards, and proper disposal of chemical waste and be introduced to basic principles of green chemistry.

6. The student will demonstrate critical thinking skills in chemistry: interpretation, evaluation, explanation, and scientific inquiry; how to ask appropriate questions, gather relevant information effectively and creatively, and reason logically from this information to make reliable conclusions.
- D. **Course Specific Objectives (CSO):** numbered to correspond to the pertinent Program Learning Outcomes (PLO). Evidence: lab reports, quizzes, lab notebooks, exams.
1. The students will be able to illustrate principles and safety rules covered in the concurrent lecture course. (PLO 1,5)
  2. Students will demonstrate the techniques of handling chemicals in the laboratory and proper laboratory techniques. (PLO 5)
  3. Students will demonstrate how to use laboratory equipment, how to take measurements using appropriate precision, and make observations to identify chemical and physical changes. (PLO 2)
  4. The students will learn and demonstrate how to carry out syntheses, calculate theoretical yield, percent yield and percent errors. (PLO 1)
  5. Students will know how to carry out qualitative and quantitative analyses using techniques such as precipitation, titration, and calorimetry. (PLO 1)
  6. Students will be able to determine and evaluate experimental errors and their impact on results. (PLO 2,6)
  7. Students will know how to use a laboratory record book, record data, analyze data and write lab reports including introductions and discussions. (PLO 4,6)

#### IV. COURSE OUTLINE

- A. Safety Practices/Basic Lab Techniques
- B. Density of Liquids and Solids
- C. Scientific Observations
- D. Determination of an Empirical Formula
- E. Limiting Reagents/Preparation of an Inorganic Compound
- F. Acid-Base Titrations
- G. The Gas Laws
- H. Calorimetry
- I. Molecular Structure

#### V. COURSE EVALUATION

##### A. Instructional Strategies:

1. Students will learn science by doing science, in this course the science focus is on chemistry. The lab applies the intellectual theory and conceptual understanding of chemistry obtained from the lecture component of the course.
  2. Writing Component: This course will promote student learning by emphasizing writing skills. There will be several writing requirements. These requirements may include short papers, article critiques, journals, portfolios, or other writing assignments.
  3. Critical Thinking, Problem Solving, and Reasoning Skills will be reinforced throughout the study of chemistry and its applications in this course.
- B. The course grade will be determined from laboratory experiments, pre-laboratory assignments, quizzes and formal lab reports. Attached is a schedule of the experiment to be performed during each laboratory session. You are expected to read the introduction and procedure to the experiment, including any supplements that are handed out, and to understand the experiment well enough to answer the "Pre-laboratory Questions" (before you arrive at the lab) and/or to take a short quiz (at the start of the laboratory session). **The "pre-lab" is your ticket to the laboratory. You will not be allowed to enter and start working in the lab until you have handed in the pre-laboratory exercise.** It is also a good idea to read the "Post-Laboratory Questions", and answer any that you can, **before** coming to lab. This will be more efficient *and* it will indicate some of the important concepts of each experiment. The standard ten-point grading scale will be used when assigning course grades.

Breakdown of Course Evaluation				
Pre-Lab from Lab Manual (Best 10 @ 10 pts)	100 pts	900-1000 pts	A	90-100%
Lab Notebook (Best 10 @ 10 pts)	100 pts	800-899 pts	B	80-89%
Lab Reports (Best 10 @ 50 pts)	500 pts	700-799 pts	C	70-79%
Formal report (1 @ 100 pts)	100 pts	600-699 pts	D	60-69%
Lab Practical Exam (1 @ 200 pts)	200 pts	Below 600	F	< 60%
<b>Total</b>	<b>1000 pts</b>			
<ul style="list-style-type: none"> <li>• <b>If, for any reason, you cannot continue to attend this class, be certain you DROP IT OFFICIALLY. Otherwise you will automatically receive a failing grade.</b></li> <li>• <b>Any student who does not obtain at least 50% of the lecture components (homework/quizzes, hourly exams and final) will fail the course.</b></li> </ul>				

Dates to Remember:			
M.L. King, Jr Day-No Class	Jan 16	First Bi-term ends	Mar 11
Evening classes begin	Jan 17	Spring Break-No Classes	Mar 13-17
Day classes begin	Jan 18	Second Bi-term begins	Mar 20
Last day add /register for Fall term	Jan 20	Easter Holiday-No Classes	Apr 14-17
Last day drop 1 <sup>st</sup> Bi-term class with W	Feb 24	Last day to drop a semester class with W	Apr 13
Midterm Week	Mar 6-10	Finals Week	May 8-12

## VI. COURSE REQUIREMENTS

A. **Attendance:** Each student is expected have punctual attendance at each class meeting. The University Undergraduate Student Attendance Policy will be followed in this course. According to that policy, only **one (1) absence** is allowed because this course meets once a week.

B. **Numbers to Remember:**

1. **Campus Security Cell Phone: 270-403-3611**
2. **Campus Security Office Phone: 270-789-5555**
3. **Natural Science Division Office: 270-789-5065**

C. **Safety Rules: Laboratory Safety and Chemical Hygiene:** Students are required to follow the necessary safety precautions at all times while in the laboratory. The laboratory and safety rules will be explained and discussed during the first meeting of the lab. During this meeting, all students will be required to sign the Chemistry Laboratory Safety Agreement that commits you to obeying the lab safety rules. Students are required to conduct themselves in a professional and safe manner (as outlined in the safety release form that you must sign and file with your instructor). **Students who are acting unprofessionally or unsafely will be ejected from the lab without the possibility of a make-up.** In order to comply with Federal Laws and OSHA regulations, students are required to come to lab dressed properly.

Students must absolutely wear a pair of ANSI Z87.1 approved goggles the **entire time** they are in the laboratory. The Chemistry Department does not keep spare goggles to lend to students. It is the students' responsibility to bring their goggles with them to the lab meeting. These must be worn even if you wear prescription lenses mounted in frames. Any time you are handling chemicals or glassware you risk the danger of eye injury. It is just as important that you wear eye protection when you wash beakers or weigh out samples on the balance as when you work at your lab bench. Goggles/glasses also protect you from the actions of your fellow lab-mates, not just from your own actions. Failure to wear your safety goggles/glasses will result in the assessment of a safety goggles penalty. For the first violation of the safety goggles rule, the student will lose 10% of the lab points for the experiment. For the second violation during the semester, another loss of 10% of the lab points for the experiment will be assessed. **The student will lose all the lab points for the third violation with no possibility of making up the experiment.** Continued violations of the safety goggles rule will result in dismissal from the course.

You **MUST** wear clothing that is consistent with good laboratory safety. The goal is to cover up as much of the body as possible with clothing that you do not mind having a few acid holes in. This goal is

often contrary to the prevailing sense of fashion. Appropriate clothing covers you from your shoulders to your ankles and closed shoes. Long pants must be worn. No shorts or skirts (above the knee) are permitted in the lab at any time. Arms should be covered to the elbow and midribs should not be exposed. Wearing a full-length lab coat or apron at all times is required. Shoes/sneakers that cover the entire foot **MUST** be worn. Sandals, clogs, open-top, high heels or open-toe shoes are not permitted in the lab at any time. Students should ensure that hair or jewelry does not hang down into the work area. Students dressed inappropriately for lab will be required to go back to their room to redress properly.

**Leave your book bags and coats outside the lab or under the coat racks inside the laboratory.**

Coats, but not heavy book bags, may be hung on the rack inside the room. Never place these items on the laboratory benches or on the floor spaces near the benches, isles, or exits. Do not sit on the laboratory benches. Only place your notebooks on spaces that you have first inspected and wiped clean.

Neatness and cleanliness are important for everyone's safety in the laboratory. The cleanliness of your work area is your responsibility. The cleanliness of the entire lab (particularly balances, sinks and fume hoods) is the responsibility of the entire class. If the lab is not left clean and neat, the responsible individuals or the entire class may have their grade lowered.

- D. **Calculator:** You will need a scientific non-programmable calculator (~ \$8 to \$20).
- E. **Pre-lab Assignments:** The student will read the lab experiment in the manual and complete the pre-lab for the given lab experiment **BEFORE** coming to class. This pre-lab assignment must be completed and turned in **at the beginning** of the laboratory period. Each lab manual pre-lab assignment will be worth ten (10) points. If the pre-lab is not complete at the beginning of the laboratory period, the student will receive a score of zero. Your ten (10) best pre-lab assignments will be counted toward your grade for a total of 100 points.
- F. **Lab Notebook:** Before each lab period, the student will complete a brief report in their lab notebook. This report will include a brief purpose statement of the lab being performed, a brief summary of the lab and sample calculations. Prior to beginning work on the experiment, the student is responsible for getting the lab instructor's initials on the pre-lab report. During the lab period, the student will keep a journal of everything you see, hear, smell, or do during the lab that is relevant to the experiment. In addition, the student will use the lab notebook to record any notes from the pre-lab lecture. More details about the format of the lab notebook will be given during the first lab period. **Before leaving the lab**, the student is responsible for getting the lab instructor's initials on the completed work in their lab notebook. Each notebook assignment will be worth ten (10) points. Your ten (10) best lab notebook assignments will be worth a total of 100 points.
- G. **Lab Reports:** Each experiment must be completed and written up in the appropriate form. Details on the form for the types of lab reports will be given in the first laboratory period. Each lab report will be worth 50 points. Your ten (10) best lab reports will be counted toward your course grade for a total of 500 points. These lab reports are due at the beginning of lab the following week. **NO LATE REPORTS** will be accepted. Failure to submit the lab report on time will result in a grade on zero.
- H. **Formal Lab Report:** Students will complete and turn in a formal lab report. The formal lab report will be worth 100 points. The format for the formal lab report will be discussed during the first week of lab. This lab report will be due at the beginning of lab the following week. **NO LATE REPORTS** will be accepted. Failure to submit the lab report on time will result in a grade of zero.
- I. **Examinations:** There will be a lab practical exam given at the end of the semester. The exam will be worth 200 points. More details about the lab practicals will be given during the first week of lab.
- J. **Teaching methods:** The instructor will demonstrate important laboratory procedures, safety precautions and a review of necessary calculations at the beginning of the lab period. Students will then work on at their own pace and complete the assigned experiment. The instructor will be available to answer questions throughout the lab period.
- K. **Classroom Behavior:**
  - 1. **Your basic responsibilities include:**
    - a. Attend all lectures, recitations and exams and bring a scientific calculator.
    - b. Read the assigned material prior to class.
    - c. Study your lecture notes and assigned text reading.
    - d. Do assigned homework problems on time and review them before exams.

- e. Do not fall behind!
  - f. Take all examinations!
2. All students are expected to behave in a manner that is conducive to a learning/teaching environment. This includes begin respectful to fellow students, guest speakers, and me. Students who engage in behavior that is disruptive to the learning environment will be asked to leave for the remainder of the class period.
  3. Guests are only allowed in class at the discretion of and with prior approval from the instructor.
  4. Electronic recording devices of any kind are not permitted except in special circumstances and with the specific permission of the instructor.
  5. While you are expected to attend, and participate in this class, your cell phone, computer, and MP3 players are **not**. Pagers, cell phones, and similar items are disruptive to the entire class and **must be turned off** during class. **The owner of any such device that activates during class will be immediately excused from class and counted as absent for the entire period.**
  6. **USE OF CELL PHONES, COMPUTERS, AND MP3 PLAYERS DURING EXAMINATIONS AND QUIZZES WILL BE CONSIDERED ACADEMIC DISHONESTY, WHICH WILL RESULT IN A ZERO BEING AWARDED FOR THE QUIZ OR EXAMINATION (NO EXCEPTIONS!).**
  7. Hats and caps are to be removed prior to entering the classroom.
  8. Take care of any physiological needs *before* coming into the classroom.
  9. Unacceptable student behaviors:
    - a. Sleeping during class
    - b. Chronic tardiness. Be here ready to learn when class begins.
    - c. Reading, studying or working on materials for other classes.
    - d. Chatting with your classmates when the instructor or other classmates are speaking.
    - e. Prematurely packing up your books and bags before class has been dismissed.
- M. **Academic Misconduct/Integrity:** Students in this course will be working toward mastery of the material to satisfy the course objectives. ***This class is held to an honor system, meaning that cheating, allowing someone to cheat, or failing to report known cases of cheating are all considered academic misconduct.*** Cheating includes, but is not limited to, any attempt to present the work of another as your own; discussing or copying exams, quizzes, or homework with students who have not yet completed them; using "cheat sheets" on exams or quizzes; altering a test for re-grade, plagiarism of primary or secondary sources of information or using programmable calculators to store and/or recall prohibited information for an exam. Any student who refuses to allow a calculator to be inspected by the instructor upon request will not be allowed to use that calculator on the exam/quiz. Be aware that aggressive methods are used to protect the majority of you who are honest. **Students caught cheating or plagiarizing will receive a grade of zero for that test or assignment and may be given an F for the course.** A copy of the Division of Natural Sciences (DNS) policy on Academic Integrity is available on the course TigerNet page. Please read this policy and take it very seriously.

For information about plagiarism and how to avoid it, consult the following website:

- Indiana University Bloomington, School of Education (accessed 15July2016)  
<http://www.indiana.edu/~academy/firstPrinciples/>.

Students will be asked to sign an integrity statement on each assignment/examination/quiz. The following statement reads as follows:

“I pledge on my honor that on this assignment/examination/quiz I have neither received nor given nor have I seen any dishonest work.

Signature \_\_\_\_\_ Date \_\_\_\_\_”

## VII. BOOK LIST (Instructional Materials needed)

- A. Lab Manual: Beran, J. A., “Laboratory Manual for Principles of General Chemistry”, 10<sup>th</sup> ed., Wiley & Sons Publishing, 2013. ISBN: 978-1118621516. Available as in e-book version or paperback version.

- B. Laboratory Notebook: A hard cover, bound composition notebook.
- C. Safety Goggles. Industrial quality safety goggles (impact resistant and splash proof) must be worn in the laboratory at all times.
- D. Safety Lab Apron.
- E. Scientific Calculator.
- F. Other materials assigned or issued by the instructor.

**VIII. DISABILITIES**

Campbellsville University is committed to reasonable accommodations for students who have documented physical and learning disabilities, as well as medical and emotional conditions. If you have a documented disability or condition of this nature, you may be eligible for disability services. Documentation must be from a licensed professional and current in terms of assessment. Please contact the Coordinator of Disability Services at 270-789-5192 to inquire about services.

**IX. ACADEMIC SUPPORT**

The Academic Support area, located in the Badgett Academic Support Center (BASC), exists to help students. At certain times, most students need some help with studying, choosing a career, major/minor, or assistance in a difficult course. The following services are available Career Services, Disability Services, tutoring, and the Citizens Bank & Trust Writing Center. *These services are provided at no extra cost to the student.* Space is also available for individual and group study, and laptop computers are available for students to check-out and use within the building. Information about these services is accessible by clicking on the “Current Students” tab on the University website at [www.campbellsville.edu](http://www.campbellsville.edu). Information is also available by calling the Office of Academic Support at (270) 789-5064.

**I. TITLE IX**

Campbellsville University and its faculty are committed to assuring a safe and productive environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office of Civil Rights, the University requires all responsible employees, which includes faculty members, to report incidents of sexual misconduct shared by students to the University’s Title IX Coordinator.

*Title IX Coordinator:*

Terry VanMeter  
 1 University Drive  
 UPO Box 944  
 Campbellsville, KY 42718

Administration Office 8A  
 Phone: 270-789-5016  
 Email: [twvanmeter@campbellsville.edu](mailto:twvanmeter@campbellsville.edu)

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: [www.campbellsville.edu/titleIX](http://www.campbellsville.edu/titleIX)



### Tentative Course Schedule for CHE 113-91 Spring 2017

Week of	Experiment	Text
JAN 16	No Lab	
23	Laboratory Check-In; Safety Practices in the Lab Safety Course syllabus, lab report formats, etc. The Lab and SI	Dry Lab #1
30	Basic Lab Operations	Expt. 1
FEB 6	Percent Water in a Hydrate	Expt. 5
13	Chemical Nomenclature	Dry Lab #2
20	Acids, Bases and Salts	Expt. 6
27	The Empirical Formula	Expt. 7
MAR 6	<b>Mid-term Week</b> Preparation of Strontium Iodate Monohydrate (Limiting Reagent) Formal Lab Report	Handout SYNT 347
13	<b>Spring Break -NO CLASS</b>	-----
20	A Volumetric Analysis	Expt. 9
27	Analysis of Vinegar	Expt. 10
APR 3	Calorimetry	Expt. 25
10	Atomic and Molecular Structure	Dry Lab #3
17	<b>Easter Break (Apr 14-17)-NO LAB</b>	-----
24	Molar Mass of a Volatile Liquid	Expt. 12
MAY 1	<b>Lab Practical/Final Exam</b> <b>Laboratory Check Out</b>	-----
8	<b>FINALS WEEK- No Lab</b>	-----



COURSE #: \_\_\_\_\_ SEMESTER: \_\_\_\_\_

COURSE TITLE: \_\_\_\_\_

**Student's Acceptance of Course Policies**

Please fill out and sign the following form and **return it no later than** \_\_\_\_\_ to the instructor. **Use a blue or black pen (no pencil).**

I, \_\_\_\_\_, have read the entire syllabus describing the course  
(Print your name neatly)

policies for this course, taught by Ms. E. Kay Sutton. I fully understand these policies and I agree to comply with them during the entire \_\_\_\_\_ term.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_