CAMPBELLSVILLE UNIVERSITY

COURSE SYLLABUS

PLEASE TYPE. DATE 12 January 2017

ACADEMIC UNIT Natural Science Division FACULTY Elizabeth K. Sutton

Discipline	Course # Section	Title of Course	Credit Hours	Cross Reference (if applicable)
CHE	355-91	Environmental Chemistry Lab	0.0	ENV 355-91

TEXTBOOK [X] Required [ ] Not Required

Author Boehnke, D. Neal Title "Laboratory Experiments in Environmental Chemistry"

Publisher Prentice-Hall Date of Publication 2000

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

1. DESCRIPTION OF COURSE: Develop a brief description of the course as it will appear in the Catalog.
2. COURSE OBJECTIVES: List the objectives of the course, **both** general and specific. Please relate these objectives to the mission and goals of the University and the Academic Unit.
3. COURSE OUTLINE: Outline the topics/units that are to be taught.
4. EVALUATION: How do you plan to determine the grade in the course. Please include grading scale.
5. REQUIREMENTS
   a. Examinations: State when tests are to be administered, including unit, mid-term, and final examinations.
   b. Reports: How many, length required, and what type (oral, term and/or research, book critiques).
   c. Supplemental reading assignments or outside work required.
   d. 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

CAMPBELLSVILLE UNIVERSITY E. K. Sutton
NATURAL SCIENCE DIVISION SSC 206
COURSE SYLLABUS Office Hours: As posted
Spring Semester 2017 E-mail: eksutton@campbellsville.edu

Course Title: CHE\ENV 355-91 Environmental Chemistry Lab

Section 1: Course Description

This course is designed to provide the student with laboratory experience of the techniques discussed in Environmental Chemistry (CHE/ENV 355). One three-hour lab per week

Section 2: 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.
   7. Social Responsibility and Citizenship: Students will demonstrate an understanding of personal and social responsibility in a changing global environment so that students can make contributions to their respective discipline and to society as a whole.

B. **Student Learning Outcomes (SLO)**: Students will demonstrate their laboratory skills and problem solving ability in this course. (numbered to correspond to the pertinent General Education Curriculum Objective [GECO])
   1. Students will specifically demonstrate laboratory and safety techniques that are related to quantitative analysis of solution chemistry and chemical samples. (GECO 6; Evidence: lab reports, lab notebooks)
   2. Students will develop skills to critically analyze the validity of experimental data.(GECO 6; Evidence: lab reports; lab notebook)
   3. When possible, real life samples will be used to expose students to practical, real-world problem solving of contemporary, historical, technological, and societal issues. (GECO 2,6,7; Evidence: lab reports)
   4. Students should be able to read, understand, and apply scientific information through thinking more critically, discussing more meaningfully, arguing more persuasively, and writing more effectively. (GECO 2,5; Evidence: lab reports, lab notebook**)**
   5. Students will develop an awareness of how a basic understanding of chemistry, the proper application of that knowledge, and the interaction between chemistry and other fields of study and careers is important to personal and social issues. (GECO 4,6,7; 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, 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 Objectives**: The student is expected to demonstrate and apply the following concepts to problem solving: (numbered to correspond to the pertinent Program Learning Outcome [PLO])
1. The student will demonstrate the ability to analyze problems in environmental chemistry. (PLO 2,4,6; Evidence: lab reports, lab notebook)
2. The student will be able to illustrate the fundamental principles of chemistry and their applications in environmental applications. (PLO 1; Evidence: lab reports)
3. The student will be able to plan out an experimental procedure with good lab techniques. (PLO 2; Evidence: lab reports, lab notebook)
4. The student will demonstrate the ability to conduct accurate chemical analyses on environmental samples. (PLO 2; Evidence: lab reports, lab notebook)
5. The student will illustrate how to interpret chemical data on environmental samples. (PLO 2,6; Evidence: lab reports, lab notebook)
6. The student will be able to write both short and long reports describing their work and interpreting the significance of the results. (PLO 4; Evidence: lab reports)

Section 3: Text and Course Outline

A. Text: "Laboratory Experiments in Environmental Chemistry" by D. Neal Boehnke, Prentice-Hall (2000)

B. Course Outline
1. General Laboratory Techniques
2. Water Analysis
3. Soil Analysis
4. Atmospheric Analysis

Section 4: Evaluation

Each experiment is worth 50-100 points. These experiments will be worth a maximum of 600 points. The laboratory notebook will be graded for a maximum of 100 points. A total of 700 points is possible. The grade in this laboratory component will count for 20% of the overall course grade. Long lab reports are substantial written reports and include references from the scientific literature. More details on both types of reports will be given in class and on your lab handouts.

Dates to Remember:

Evening classes begin	Jan 17	First Bi-term ends	Mar 11
Day classes begin	Jan 18	Spring Break-No Classes	Mar 13-17
Last day add/register for Spring term	Jan 20	Second Bi-term begins	Mar 20
M. L. King, Jr Day-No Class	Jan 16	Easter Holiday-No Classes	Apr 14-17
Last day to drop 1st 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

In the event of class cancellation for any reason (weather, instructor illness, etc.) exams or other scheduled activities will be administered in the next active class period.

Section 5: Course Requirements

A. *Attendance:* Each student is expected to be in attendance at each class meeting. The University's Undergraduate Attendance Policy will be followed in this course. There are no excused absences. Arrival at class ten minutes or later after the class has begun or sleeping in class will be counted as an absence.

B. Numbers to Remember:
a. Campus Security Cell Phone: 270-403-3611
b. Campus Security Office Phone: 270-789-5556
c. Natural Science Division Office Phone: 270-789-5065

C. *Safety:* Students are required to follow all safety precautions at all times while in the laboratory. This includes the wearing of protective eyewear and clothing.

D. *Laboratory Notebook:* Students are required to keep a laboratory notebook detailing the procedures, data, etc., obtained in the lab analyses conducted during the course. The format for the notebook will be discussed in class. The first three pages of the notebook are left blank for your Table of Contents. The notebook pages must be used sequentially in *historical time order*. For example, while preparing for a lab, don't "skip" five or six pages, for example, for that particular experiment. In the laboratory, **all** information, data, calculations, notes, etc. should be recorded directly into this notebook and **not** on scrap paper. *Information written on anything other than the lab notebook pages (notebook paper, paper towels, etc) will be confiscated*. The lab notebook should be written in blue or black permanent in a clear and concise format. Errors should be crossed out with a single line and the correction written next to it. Don't scribble completely over the error. Your notebook must reflect the absolute truth of your laboratory experience. Each page of your notebook must be dated. **Before you leave the laboratory each time you have done lab work, the instructor must review your work and initial and date your notebook just below where your entries end.**

E. *Laboratory Reports:* One of the objectives of this course is to acquaint the student with various methods of environmental analyses. To achieve the objective, students will perform several experiments illustrating a variety of methods used in environmental science. Upon completion of these experiments, students will submit written reports of their findings. **The laboratory reports are due one week after the experiment is completed.** Reports will be penalized 1 point per day (including weekends) for every day the report is late. Further details about the written reports will be given in class.

F. *Pre-Lab Write-Up:* Before beginning an experiment, you must be able to work efficiently in the lab. In order to accomplish this, it is important that you thoroughly understand the lab BEFORE you perform the experiment. Read the laboratory handout and map out your work plan before the laboratory period. You need to write out your "Theory" and "Procedure" sections in your laboratory notebook **before** beginning the experiment. Be sure that these sections are in your own words and not just copied procedures from the handouts. **You must have your Pre-Lab Write-Up reviewed and initialed by the instructor before you begin the experiment.** In addition, you **MUST** record your data directly into your laboratory notebook. Scrap pieces of paper, paper towels, etc will be confiscated and discarded. **Before you leave for the day, the instructor MUST review, date and initial your work in your notebook.**

G. *Laboratory Conduct:* Your laboratory performance and technique will be evaluated during each experiment. Examples of performance/techniques the will result in the loss of points include, but are not limited to: poor safety practices (not wearing safety goggles and/or lab apron at all times in the laboratory), consistently arriving late to the lab, using dirty glassware, disorganized work areas, misuse and abuse of equipment, not cleaning your work area and common areas before leaving for the day, insubordination.

H. *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 proceed at their own pace and complete the assigned experiment. The instructor will be available to answer questions throughout the lab period.

I. *Classroom Behavior:*
1. Guests are only allowed in class at the discretion of and with prior approval from the instructor.
2. Electronic recording devices of any kind are not permitted except in special circumstances and with the specific permission of the instructor.
3. 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.**

4. 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!).
5. Hats and caps are to be removed prior to entering the classroom.
6. Take care of any physiological needs *before* coming into the classroom.
7. 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.

I. **Academic Misconduct:** Students in this course will be working toward mastery of the material to satisfy the course objectives. Cheating in any form will not be tolerated and will immediately result in a failing grade for the course as well as the maximum penalty allowed by the University, which may include expulsion. ***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. For information about plagiarism and how to avoid it, consult the following website: https://www.indiana.edu/~academy/firstPrinciples. Students will be asked to sign an integrity statement on each examination and quiz. The following statement reads as follows:

"I pledge on my honor that on this examination/quiz I have not received, given or seen any dishonest work.

Signature _____ Date _____"

Section 6: Book List

There is no book list for this course.

Section 7: 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.

Section 8: 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 is also available by calling the Office of Academic Support at (270) 789-5064.

Section 9: 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 — Administration Office 8A
UPO Box 944 — Phone: 270-789-5016
Campbellsville, KY 42718 — Email: 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

Tentative Course Schedule- CHE 355 Environmental Chemistry--Spring 2017

Date	Week #	Experiment	Text
1/19/2017	1	**No Lab**	
1/26/2017	2	Check In, Safety, basic skills, statistical treatment of data	Wk. 1 Handout; Expt. #1
2/2/2017	3	Calibration curves and spectrophotometry (Fe analysis)	Wk. 2 Handout, Expt. 9
2/9/2017	4	*Lecture Exam 1*	---
2/16/2017	5	Water quality and stream flow analysis	Wk. 3 handout; Expt. 4, 5,6,7
2/23/2017	6	Water quality and stream flow analysis	Wk. 3 handout; Expt. 4, 5,6,7
3/2/2017	7	Water quality-Hardness and Determination of Ca	Wk. 4 handout; Expt. 5,8
3/9/2017	8	***Mid-Term Week*** *Lecture Exam 2*	---
3/16/2017	9	***Spring Vacation -- No Class***	---
3/23/2017	10	pH and buffering capacity	Wk. 5 handout; Expt. #3
3/30/2017	11	Air Sampling	
4/6/2017	12	Soil Determination [Temp, Salinity, pH, Moisture]	Vernier 8,9,10,11,12
4/13/2017	13	*Lecture Exam 3*	---
4/20/2017	14	Fluorimetric Determination of PAH's	Expt. #15
4/27/2017	15	Global Warming	Vernier 20,21,25,30
5/4/2017	16	Check out.	--
5/11/2017	17	**Finals Week--No Lab**	--
In the event of class cancellation for any reason (weather, instructor illness, etc.) exams or other scheduled activities will be administered in the next active class period.			

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: _____