COURSE #: CHE 360 4 Credits	**COURSE TITLE:** CHEMICAL ENGINEERING LABORATORY I
TERMS OFFERED: Fall, Winter	**PREREQUISITES:** ChE 342 Mass and Heat Transfer, ChE 343 Separation Processes
TEXTBOOKS/REQUIRED MATERIAL: Course Pack available on course website	**COGNIZANT FACULTY:** Barteau, Eniola-Adefeso, Kotov, Northrop, Scott, Yang
INSTRUCTORS: Yang, Solomon, Wang, Tadd, Eniola, Wisniewski, Northrop	**FACULTY APPROVAL:** 2013-12-19
CoE BULLETIN DESCRIPTION: Experimentation in thermodynamics and heat, mass, and momentum transport on a bench scale. Measurement error estimation and analysis, Lecture, laboratory, conferences, and reports. Technical communications.	**COURSE TOPICS:** (number of hours in parentheses) 1. Carry out 3 laboratory experiments using principles learned in previous courses. Analyze experimental results and write technical report. (continuous throughout the term) 2. Concept of calibration and instrumentation. (3) 3. Preparation of technical documents (reports, memos, SOPs). (6) 4. Uncertainty analyses. (6) 5. Use of computer for data acquisition and data analyses. (3) 6. Oral presentations. (2) 7. Safety training (1)
COURSE STRUCTURE/SCHEDULE: Lecture: 2 per week @ 1 hour; Laboratory: 1 per week @ 4 hours	

COURSE OBJECTIVES	Links shown in brackets are to course outcomes that satisfy these objectives. 1. To expose students to a few hands-on experiments.[1] 2. To teach students how to design and carry out experiments as well as how to analyze and interpret real data.[1,2,3] 3. To teach students how to generate various technical documents and reports.[4,5] 4. To provide opportunities for students to communicate orally experimental findings to colleagues.[7] 5. To provide experience for students to work in team environment.[6] 6. To familiarize students with computer-based data acquisition and analyses.[1] 7. To provide opportunities for students to experience and characterize uncertainty in experimental results.[2,3] 8. To show students how previous work in chemical engineering is useful to them. [2]
COURSE OUTCOMES	Links shown in brackets are to student outcomes a-k 1. Organize and carry out experimental design and actual hands-on experiments.[a, b, k] 2. Apply previous course material to analyze and interpret experimental data. [a, b, k] 3. Perform statistical analysis, error propagation analysis and significance testing to characterize uncertainty in experimental data. [b,g] 4. Write organized and cohesive technical memos and reports [a, b, g] 5. Organize and prepare standard operating procedures (SOPs). [g] 6. Work effectively in a team environment; prepare individual and team evaluations. [d] 7. Prepare and present technical presentations before colleagues and answers questions.[g]
ASSESSMENT TOOLS	1. Technical reports based on team work assess outcomes 1-4,6 2. Calibration reports with 2 SOPs assess outcomes 1,5 3. Work plans and Progress reports with feedback from instructors assess outcomes 1-4 4. SOP assessment (individual assignment) assesses outcome 4 5. Oral presentations of final reports with evaluations from instructors assess outcomes 1,2,7 6. Exam on uncertainty analyses assesses outcomes 1,2,4,5 7. Periodic individual, team, and laboratory supervisor evaluations assess outcome 6. 8. End of term course evaluation provides student self-assessment of outcomes 1-7