Spring 2020

CHE 495-002: Chemical Engineering Lab I

Sagnik Basuray

SYLLABUS FOR CHE 495

Pre-requisite Courses:

ChE 370 (Heat & Mass Transfer), Eng 352 (Technical Writing),
Math 225A (Survey of Probability & Statistics for ChEs)

Class Meetings:

Section 002: Mondays 2:30-5:20 PM
Fridays 9:15-11:20 AM

Attendance is Mandatory! If you need to miss class, let me know in advance if you can. Make sure your group knows in advance of your absence, if you can. Always meet in basement lab first for announcements and any short lectures before proceeding to experiments. Attendance will not be taken, but professional behavior is expected!

Instructor Information:

Office Hour: Mondays 1-2:30 PM Available other times – find me or stop by.
Office Location: 361 Tiernan Hall
Office Phone: (973) 596-5706 Fax: (973) 596-8436
Email (preferred contact mode): sbasuray@njit.edu

Teaching Assistant: Evaristo Villaseco (ev92@njit.edu). Note that the instructor grades all student work. The TA only assists during lab classes, as needed.

Course Requirements and Grading:

Four experiments will be assigned to each group. All reports and presentations are to be group efforts and submissions. Submitted reports should be hardcopy. Electronic submissions are allowed only with permission of the instructor.

- Industrial Memo 25 %
- Oral presentation (PPT - peers) 25 %
- Scholarly paper 25 %
- Oral presentation (PPT - management) 25 %

NOTE: Draft written reports (Industrial Memo, Scholarly Paper - due after experiment is completed (see schedule). These will be returned with comments and a draft grade. Final drafts are due 1 week after return. This policy will be enforced. There are no graded "first drafts" of PPT slides for the Oral presentations, but you're encouraged to show drafts to the instructor for helpful comments.

Groups:

Determined 1st class; 3 students per group. Rotating group leader - Self-policing (PROFESSIONAL CONDUCT EXPECTED!) Peer & Self Evaluations done after Experiments 1 and 2, and again after Experiments 3 and 4. Results will impact individual final course grades! So take your group responsibilities seriously.

***Canvas* Site:** http://canvas.njit.edu --- Please check this site and your email often (at least once a day). Practice problems will be posted, as well as HW and test solutions, group projects, some in-class work, and useful memos.

Math Solver: You must have access to and know how to use one math solver software package. Examples include *Polymath*, *Maple*, *Matlab*, *Mathcad*, and *Mathematica.*

Polymath is available on dep't PCs in 411 Tiernan, as is the **license** info for program download onto your laptop. Three podcasts (Algebraic Equations, ODE's, Regressions) are available in the Media Gallery of the course *Canvas* site to help you learn *Polymath*, if you choose to use it.

Lab Manual:

Laboratory Manual for ChE 495 – Fall 2019 --- available on *Canvas* site in 2 parts:
→ Introduction → Experiments

Safety Lecture:

A mandatory lab safety lecture by Mr. Yetman will be provided immediately after the course introduction on the first class meeting. Attendance will be taken.

Information Literacy Lecture:

A mandatory Information Literacy lecture provided by Sagnik Basuray on behalf of the NJIT Library staff will be will be provided immediately after the safety lecture on the first class meeting. Attendance taken. See Master Schedule.

Policy on Integrity: Professional behavior is expected at all times in this course.

- Every student expected to his/her fair share of the work load within the group
- Safety-conscious behavior in the labs is required at all times
- Use of data and/or reports not your own, unless instructor-authorized, is prohibited
- Submission/completion of work in a timely manner is expected
- If you use *Polymath*, you will follow the license guidelines – no commercial use.

Specific goals (Learning Attributes) for the course:

a. Students will be able to:

1. Operate fluid flow applications (pipe flow, packed tower), and collect quality data, including pressure drops
2. Operate heat exchangers (transient, steady state), and collect quality data, including fluid stream temperatures
3. Analyze data, and apply appropriate theoretical models in fluid flow and heat transfer
4. Plan an experiment and take enough data to get meaningful results
5. Handle their data ethically and correctly, and appreciate the dynamic between data and models
6. Present their results critically, and draw useful conclusions

7. Present their results using quality plots and tables that reveal key relationships
8. Analyze audiences and tailor their reporting for optimal communication
9. Report their data and analyses consistent with the assigned reporting structure

b. This course explicitly addresses the following ABET student outcomes: 1, 2, 3, 4, 6

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions