

## ChE 407L – Transport Operations Laboratory

### Required?

Yes.

### Course (catalog) description:

Bench scale experiments with written reports in thermodynamics; momentum, heat and mass transport. Includes selected experiments in determination of thermodynamic properties, transport properties, and heat and mass transfer coefficients. Study of measurement error, statistical estimation and analysis.

### Prerequisites:

ChE 306 and ChE 315L    Corequisite ChE 307

### Textbook(s) and/or other required material:

None

### Recommended references:

1. Mohammad Aliedeh, "*ChE 422L Laboratory Manual*," Aug. 2001.
2. Long, Barna, Bridges, Rakow & Wilson, "*Guide to writing and problem Solving for Chemical Engineers*," Kinko's Publishing Group., 1983
3. Holman, J. P., "*Experimental Methods for Engineers*," McGraw Hill, Fourth Edition., 1984.
4. Whitmyer, Long, "*Guide to Safety in the Laboratory for Chemical Engineers*," Kinko's Publishing Group.
5. Weissenberg and Buker, "*Writing Up Research*," Prentice Hall, New Jersey, 1990.

### Course objectives:

- (1) To teach students the performance and observation of, and obtaining data from, transport operations equipment.
- (2) To teach students proper and effective group work practices in lab environments.
- (3) To teach students proper oral presentation and formal report writing.
- (4) To give students experience with equipment and procedures discussed in classes and used in the chemical industry.

### Topics covered:

1. Continuous distillation.
2. Fluid flow
3. Mass transfer
4. Heat transfer
5. Experimental design
6. Data analysis
7. Written and oral presentations

**Class/laboratory schedule:**

Tuesday and Thursday 1:10-3:50 pm, in JH 171, two 160 minute periods

**Contribution of course to meeting professional component:**

This course is one of the “critical path” courses in the Chemical Engineering curriculum that satisfies the professional component requisite of one and one-half years of engineering topics, consisting of engineering sciences and engineering design appropriate to the student’s field of study.

**Relationship of course to program outcomes:****NMSU Program Outcomes (details below)**

<b>Ch E 412 Course Objectives</b>		<b>a.</b>	<b>b.</b>	<b>c.</b>	<b>d.</b>	<b>e.</b>	<b>f.</b>	<b>g.</b>	<b>h.</b>	<b>i.</b>	<b>j.</b>	<b>k.</b>
1	To teach students the performance and observation of, and obtaining data from, transport operations equipment.	3	3	3		3	3	2	2			
2	To teach students proper and effective group work practices in lab environments.	2	2	3	2	3	3	3	3			
3	To teach students proper oral presentation and formal report writing.	3	2	2	2	3	3	3				
4	To give students experience with equipment and procedures discussed in classes and used in the chemical industry.	3	3	3	3	2	3	3	3			

- a* Apply fundamental knowledge of mathematics, science, and engineering
- b* Design and conduct experiments, as well as analyze and interpret data
- c* Design a system, component, or process to meet desired needs
- d* Function on multidisciplinary teams
- e* Identify, formulate, and solve engineering problems
- f* Communicate effectively
- g* Use the techniques, skills, and modern engineering tools necessary for practice
- h* Professional and ethical responsibility
- i* Broad education necessary to understand the impact of engineering solutions in a global and societal context
- j* A recognition of the need for, and an ability to engage in life-long learning
- k* A knowledge of contemporary issues

*Numerical Evaluation*

- 3 significant relationship between course objective and program outcome
- 2 moderate
- 1 slight
- 0 none

**Person who prepared this description and the date of preparation:**

Charles L. Johnson, Professor , January 17, 2006.