

ChE 611
Fall 2007

Powder Technology (3 credit hours)

Instructor:

Richard Turton
433 Engineering Sciences Building
Tel: 293-2111, ext. 2415
Email: Richard.turton@mail.wvu.edu

Schedule:

M and W 3:00 pm – 5:00 pm, 449 Engineering Sciences Building

Course Objectives:

1. Students will become familiar with the different methods to characterize, measure, and compare distributions of powders.
2. Students will be able to recognize and quantify the forces between particles for a variety of situations.
3. Students will be familiar with various unit operations used to process powders and particles, e.g., mixing, agglomeration, filtration, etc.
4. Students will have developed an appreciation for the complexity of powder processing and developed the skills necessary to design equipment used to process powders and particles.

Required Text:

A set of printed course notes will be available – a nominal charge for these notes will be made.

Related and Recommended Texts:

Allen, T., *Particle Size Measurement*, 4th Ed., Chapman-Hall, London, 1990

Briscoe, B.J. and M.J. Adams, *Tribology in Particulate Technology*, Adam-Hilger, Bristol, 1987

Kaye, B.H., *Powder Mixing*, Chapman-Hall, London, 1997

Rhodes, M., *Introduction to Particle Technology*, Wiley, 1998

Rumpf, H., *Particle Technology*, Chapman-Hall, London, 1990

Tardos, G.I., *Powder Science and Technology – an undergraduate-graduate course*, NSF, 1995

Course Policies (exceptions at discretion of Instructor):

1. There are no make-up exams.
2. All problem sets are due at the beginning of class or at the stated time.
3. A late assignment = no assignment.
4. Exam grading appeals must be submitted in writing on the day the exam is returned. If you miss that class, you lose the opportunity for regrading.
5. Class attendance is strongly recommended but not required.

Grade Scale:

The nominal grading scale is	≥90%	A
	≥80%	B
	≥70%	C
	<70%	F

Grading:

Mid-Term Exam	40%
Final Exam	40%
Problem Sets	20%
Total	<u>100%</u>

Tentative Syllabus

Week	Dates	Topic
1	8/20 8/22	Particle size and shape measurement
2	8/27 8/29	Particle size characterization and size distributions
3	9/03 9/05	No Class – Labor day Packing of powders
4	9/10 9/12	No Class Faculty Senate Single particle behavior in fluids
5	9/17 9/19	Behavior of powders in packed beds
6	9/24 9/26	Behavior of powders in fluidized beds
7	10/01 10/03	Powder statics and the design of hoppers
8	10/08 10/10	No Class – Faculty Senate Powder statics and the design of hoppers
9	10/15 10/17	Inter-particle forces and tribology in particulate systems Exam 1
10	10/22 10/24	Particle size reduction Particle size enlargement
11	10/29 10/31	Pneumatic transport of powders
12	11/05 11/07	No Class - AIChE No Class - AIChE
13	11/12 11/14	No Class – Faculty Senate No Class
14	11/19 11/21	No Class -Thanksgiving Break No Class -Thanksgiving Break
15	11/26 11/28	Filtration
16	12/03 12/05	Separation Multi-particle systems
17	12/12	Final 11 – 1 pm

Final Exam Wednesday 12/12 at 11:00-13:00