

UNIVERSITY CURRICULUM COMMITTEE

DATE OF OPEN HEARING (if necessary) 2/9/99 (College level only)

APPROVED

NOT APPROVED

COMMENTS:

Rebecca Brown 3/4/99
SIGNATURE DATE

SENATE

Date announced at Senate 2/23/99

Voted upon at Senate: **Approved** **Not Approved** **Date:**

EXECUTIVE VICE PRESIDENT/PROVOST

APPROVED

NOT APPROVED If no, reasons are as follows:

STUDENT CREDIT HOURS _____ FACULTY LOAD HOURS _____ EQUALIZED CREDIT HOURS _____

OFFICIAL COPY & APPROVAL SHEET FILED (DATE): _____

DATE/SIGNATURE EXECUTIVE VICE PRESIDENT/PROVOST

[Handwritten Signature]

REGISTRAR

DATE APPROVED COURSE DESCRIPTION RECEIVED _____

HEGIS TAXONOMY & COURSE NUMBER ASSIGNED CRCG.574

DATE/SIGNATURE OF REGISTRAR Robert A. Kulot 3/25/99

NOTIFICATION FORWARD:

SENATE CURRICULUM COMMITTEE CHAIRPERSON

DEPARTMENT CHAIRPERSONS

ACADEMIC DEAN(S)

REGISTRAR

SPONSOR(S)

TIM 3/21/99

Course Proposal

1. Details:

a) Course Title:	Advances in Particle Technology (0906.574)
b) Sponsor:	Dr. Zenaida Otero Keil and Chemical Engineering Curriculum Committee
c) Credit Hours:	3 credit hours
d) Course Level:	Graduate
e) Curricular Effect:	Technical elective for engineering graduate courses
f) Prerequisites:	Graduate standing and approval of Graduate Advisor
g) Suggested Time/ Scale of Implementation:	Fall 1999 1 section
h) Resources:	Faculty will be hired consistent with the College of Engineering multi-year budget. Computer software required is available or will be acquired with approval of the College of Engineering Computer Committee. Laboratory equipment purchases will be consistent with the College of Engineering capital budget. Required library acquisitions will be consistent with current acquisition plan.

2. Rationale:

The proposed course is a new offering consistent with other courses in the Engineering Curriculum Proposal approved by the College Senate in December 1994. The proposed course is consistent with the establishment of the College of Engineering approved by the Board of Trustees in February 1995.

The course will address multidisciplinary topics in particle technology that are relevant to many areas of engineering and science. The course will describe the basic principles of particle technology processes and applications. This will include chemical reactions involving particles, separations, and transport processes. Particle properties will also be discussed including bulk and chemical properties, rheology, and size reduction and enlargement.

3. Essence of the Course:

a) Objectives:

Upon completion of the course, students will be able to:

1. Understand the fundamentals principles governing particle properties
2. Understand particle flow and the thermodynamics and kinetics associated with major industrial processes involving particles
3. Design particle manufacturing processes and chemical processes involving

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4. Model and simulate processes involving particles
5. Use computer software to assist in problem synthesis and analysis of processes involving particles
6. Work in teams to solve open-ended design problems.

b) Topical Outline:

The topics to be covered are listed below. The instructor will supply the students with a syllabus during the first week of classes. The instructor will assess any technology advances in the subject matter prior to the course and make topic changes as deemed appropriate to maintain the level and currency of instruction.

- I. Introduction and Basic Principles
 1. Particle Properties
 2. Particle Behavior in Chemical Processes
 3. Thermodynamics
 4. Flow, Heat and Mass Transport
 5. Kinetics

- II. Particle Manufacturing
 1. Chemical Manufacturing
 2. Physical Processes
 3. Novel Techniques

- III. Fundamental Physical Processes
 1. Motion of Particles in a Flowing Medium
 2. Flow Through Packings
 3. Mechanics of the Fluidized Bed
 4. Continuum Mechanics of Packings
 5. Deformation and Fracture of Solids
 6. Adhesion
 7. Particle Metrology

- IV. Processes
 1. Separation Processes
 2. Mixing Processes
 3. Agglomeration and Coagulation Processes
 4. Comminution Processes
 5. Conveying, Storing and Feeding of Bulk Solids
 6. Novel Processes

c) Evaluation and Grading Procedure of Students:

Student grades will be based on examinations, homework and a required semester project. A course syllabus with a stated method of arriving to the final grade, e.g., number of exams, projects, homework, percentage of grade, will be distributed to students the first week of classes.

d) Course Evaluation:

The proposed course will be evaluated on the basis of student evaluations and curriculum review by appropriate faculty.

4. Results of Consultations:

The proposed course is part of the Engineering Curriculum Proposal approved by the Faculty Senate in December 1994 with consultations. No additional consultations are required.

Catalog Description

Advances in Particle Technology (0906.574)

Prerequisite: Graduate standing and approval of Graduate Advisor

This course introduces students to application of chemical engineering fundamentals in the particle processing industry. Processes involving particles are an important part of the chemical process industry. These processes range from fluidized catalytic cracking of oils to coating processes in the pharmaceutical industry. Students will use advanced principles in fluid flow, heat and mass transport, and kinetics to analyze and design particle manufacturing processes and chemical industry processes involving particles. Novel processes will also be discussed and analyzed.