APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by College of Engineering: Chemical & Materials Engineering  
   Date: 12/3/01

2. Changes proposed:
   (a) Present prefix & number: MSE 403G  
      Proposed prefix & number: MSE 403G
   (b) Present Title: Ceramic Engineering  
      New Title: Ceramic Engineering and Processing
   (c) If course title is changed and exceeds 24 characters (including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts:
   (d) Present credits: 4  
      Proposed credits: 4
   (e) Current lecture: laboratory ratio: Lecture 4/Lab 0  
      Proposed: Lecture 3/Laboratory 3
   (f) Effective Date of Change: (Semester & Year) Spring 2003

3. To be Cross-listed as:

4. Proposed change in Bulletin description:
   (a) Present description (including prerequisite(s)):
      Relating the structure and bonding in ceramic materials to their mechanical, magnetic, optical, and thermal properties. Processing, shape-forming, densification and machining of ceramic; design considerations.
   (b) New description:
      Microstructure of crystalline ceramics and glasses, and role of thermodynamics and kinetics in its formation. Effect of microstructure on mechanical and physical properties. Lecture 3 hours; laboratory 3 hours.
   (c) Prerequisite(s) for course as changed: MSE 201, MSE 301 or consent of instructor. Engineering Standing

5. What has prompted this proposal?  
   ABET report

6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:  
   Minor revisions of content and addition of laboratory activities (see attached sheet)

7. What other departments could be affected by the proposed change?

8. Will changing this course change the degree requirements in one or more programs?*  
   No

9. Is this course currently included in the University Studies Program?  
   Yes

10. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.

*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.
11. Is this a minor change? □ Yes [X] No

(Note: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

12. Within the Department, who should be consulted for further information on the proposed course change?

Name: Fuquian Yang

Phone Extension: 7-4956

Signatures of Approval:

[Signature]
Department Chair

[Signature]
Dean of the College

[Signature]
1/07/02
Date

[Signature]
2/20/02
Date

**Undergraduate Council

**Graduate Council

**Academic Council for the Medical Center

**Senate Council

Date of Notice to University Senate

**If applicable, as provided by the Rules of the University Senate.

ACTION OTHER THAN APPROVAL

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The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

a. change in number within the same hundred series;
b. editorial change in description which does not imply change in content or emphasis;
c. editorial change in title which does not imply change in content or emphasis;
d. change in prerequisite which does not imply change in content or emphasis;
e. cross-listing of courses under conditions set forth in item 3.0;
f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 11/98
Ceramics Processing Laboratory

1. Description
This is a three (3) hours laboratory course associated with the Course 403G – Ceramics Engineering. The lab focuses on the processing and characterization of the physical properties of ceramics materials. Particular emphasis is made on pressing process, strength, microstructures, mechanical, rheological, and electrical properties.

2. Learning Objectives
Having successfully completed this lab, the student will be able to:
- Apply the powder processing for the formation of ceramic bodies.
- Understand the rheological properties of ceramic suspensions.
- Interpret microstructures and their relationship to properties.
- Utilize various methods of sample preparation leading to the measurement of physical properties.
- Utilize various instruments to quantize the physical properties of ceramic body.

3. Justification
- This is the formal exposure for the MSE students on the practical aspects of processing and characterization of ceramic materials. This course provides students a hands-on experience with current techniques used in industry to synthesize, process, and characterize bulk ceramics. The lab gives students a strong foundation on the processing and properties of ceramics.
- The lab course will be presented as several projects for the characterization and development of ceramic materials. The following are the tentative experiments.
  a) Particle suspension – viscosity and its measurement
  b) Forming of ceramics – die pressing and sintering (firing)
  c) Sample preparation – mounting, grinding, polishing, etching
  d) Microstructure and packing homogeneity – optical microscopy, density, porosimetry
  e) Bending strength and hardness tests
  f) Dielectric properties

4. Textbook

Note:
Grades will be distributed by relative curve (with consideration to performance of past years and level required). Graduate level students will be graded on different scale. For independent project, graduate presentations will be 25 min. and 8-10 page report.