UNIVERSITY OF KENTUCKY
APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by College of ___________________________ Date 9/15/05
   Department/Division offering course ___________________________
   Chemical & Materials Engineering

2. Changes proposed:
   (a) Present prefix & number MSE 403G Proposed prefix & number Same
   (b) Present Title Ceramic Engineering and Processing
       New Title SAME
   (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: 3
   (e) Current lecture: laboratory ratio 3/3 Proposed: 3/10
   (f) Effective Date of Change: (Semester & Year) Fall 2006

3. To be Cross-listed: ___________________________ Signature: Department Chair

4. Proposed change in Bulletin description:
   (a) Present description (including prerequisite(s):
       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. Prereq: MSE 201, MSE 301 or consent of instructor, Engineering Standing.
   (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. Prereq: MSE 201, MSE 301 or consent of instructor, Engineering Standing.
   (c) Prerequisite(s) for course as changed: MSE 201, MSE 301 or consent of instructor, Engineering Standing.

5. What has prompted this proposal?
   Upon recommendation from our advisory board, and input from students and faculty, we are dropping the lab component of this course, along with that of four others, and are creating two 3-credit hour labs, to be offered in two consecutive semesters.

6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:

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

8. Is this course applicable to the requirements for at least one degree or certificate at the University of Kentucky? ☑ Yes ☐ No

9. Will changing this course change the degree requirements in one or more programs?*
   If yes, please attach an explanation of the change.*
   ☐ Yes ☑ No

10. Is this course currently included in the University Studies Program?
    If yes, please attach correspondence indicating concurrence of the University Studies Committee.
    ☑ Yes ☐ No
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12. If the course is 400G or 500 level, include syllabi or course statement showing differentiation for undergraduate and graduate students in assignments, grading criteria, and grading scales. [x] Check here if 400G-500.

12. 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.)

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

Name: DR. LYNN PENN Phone Extension: 257-7997

Signatures of Approval:

[Signature]
Department Chair

[Signature]
Dean of the College

[Signature]
**Undergraduate Council

[Signature]
**Graduate Council

[Signature]
**Academic Council for the Medical Center

[Signature]
**Senate Council

**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 3/04
Differentiation for Graduate and Undergraduate Students

All graduate students will complete the same homework, exams, classroom assignments, and short reports required of the undergraduates in the class. In addition, graduate students will be required to submit a comprehensive report on an assigned topic.
MSE 403G: Ceramic Materials and Processing
(Required course)

Credits: 3

Course description: Relating the structure and bonding in ceramic materials to their mechanical, electrical, magnetic, optical, and thermal properties; processing, shape-forming, densification and machining of ceramic; design considerations.

Prerequisites: MSE 301: Materials Science
Basic knowledge of thermodynamics
Elementary crystallography and crystal structure
Phase diagrams


Instructor: Fuqian Yang (Ph.D.), Assistant Professor
161 Anderson Hall, Phone: 257-2994
Email: fyang0@pop.engr.uky.edu

Lecture: 3 hours (2 sessions) per week. Tuesday/Thursday: 2:00 Pm - 3:15 PM

Grading: Homework, 20%
(undergraduate student) Midterm Exam, 35%
Final Exam, 45%

Grading: Homework, 10%
(graduate student) Term paper, 10%
Midterm Exam, 35%
Final Exam, 45%

A term paper is required for graduate students in addition to the requirement for undergraduate students. The term paper will have 10% weight on the final grade.

A is 90-100, B is 80-89, C is 70-79, D is 60-69, and E is 59 or below.
Topics covered:
- Introduction to crystal structure and crystallography
- Fundamentals of structure of atoms
- Structure of ceramics and its influence on properties
- Binary and ternary phase diagrams
- Point defects in ceramics
- Ceramics processing
- Mechanical properties of ceramics
- Thermal properties of ceramics
- Electrical properties of ceramics

Course objectives:
- Have an in depth understanding of the crystal structure of ceramics
- Comprehend the structure-property relationship in ceramics
- Be able to identify and use a phase diagram
- Be able to identify the defects in ceramics (Point defects)
- Have rudimentary knowledge of the processing of bulk ceramics
- Be acquainted with applications of ceramic materials in structural and electrical components

Homework Policy:

Homework will generally be assigned each week on Thursday and due the following Thursday. Students need to finish the homework independently. The homework is to be turned in at the beginning of the class period. No late homework will be accepted. Students finding difficulty understanding a particular topic or homework problem are encouraged to meet with the instructor during the office hours.

Exams:

There will be two exams. Failure to write an exam will result in a score of zero. No makeup exams will be given. Upon prior notification of the instructor, allowances will be made under extreme circumstances. Upon the receipt of a graded exam, if you find that an exam problem was graded incorrectly, it must be re-submitted to the instructor within 48 hours from the time the exam was returned.