

BACKGROUND AND REQUEST

Youngstown State University
Doctor of Philosophy in Materials Science and Engineering

Recommendation

The proposed program clearly meets the Chancellor's standards for graduate degree programs, and the Regents' Advisory Committee on Graduate Study voted approval for the new program.

Request: The College of Science, Technology, Engineering and Mathematics at Youngstown State University (YSU) requests approval for a new Doctor of Philosophy in Materials Science and Engineering degree program.

Program Purpose: Having been identified as an "urban research university" in the Chancellor's *Strategic Plan Higher Education*, the proposed PhD in Materials Science and Engineering at YSU will contribute to the vibrant research community needed to create and develop new technologies. The degree will ensure a steady supply of qualified employees for established industries as well as companies built on the intellectual property created at the university.

The proposed PhD program draws from existing YSU graduate and undergraduate programs that are complementary to materials science and engineering, building upon the existing faculty talent and the infrastructure of several departments. The development of this program represents an opportunity to design a program that promotes economic development in the region by producing PhD graduates who are focused on industry. Members of the industrial sector will be full participants in the development and execution of the program, enhancing the likelihood that the research will contribute to economic development.

Enrollments: It is anticipated that an initial cohort of 3 to 5 students per year will be admitted into the Ph.D. in Materials Science and Engineering program, and that number may grow to as many as 10 per year within five years, depending on the number of faculty participants and their success in generating externally funded research activities. YSU will recruit students nationally and internationally, but expects that initial enrollment will be largely "regional" students who are graduates from relevant departments, are already employed within the area, or are seeking career advancement for which the PhD is appropriate.

Curriculum: The proposed program will require 90 semester hours of graduate level study and an internship component is highly recommended. Coursework totaling a minimum of 36 semester hours consists of: a) a series of required core courses (16 semester hours in analytic methods and other core material science and engineering areas); b) elective courses within specialty area related to the student's research interests (a minimum of 9 semester hours); c) an recommended internship (6 semester hours maximum); and d) graduate seminars (1 semester hour per term with a 3

semester hour maximum). Graduate research and dissertation work will account for the balance of the 90 semester hour requirement.

Faculty, Facilities and Resources: The proposed program will be administered through the College of Science, Technology, Engineering and Mathematics under the School of Graduate Studies and Research. Approximately 23 faculty, staff and researchers associated with the YSU Center of Excellence in Materials Science and Engineering will contribute to the proposed Ph.D. program. The expertise of YSU's current faculty covers the four main components of materials science and engineering, i.e., structure, processing, properties and performance/application. YSU is in the process of hiring four new faculty members in strategic areas to support the proposed program. The research facilities are adequate for the proposed degree. The faculty has demonstrated its ability to attract external funding to support doctoral students, and the School of Graduate Studies and Research is well poised to provide basic grants-management services for the university.

Rationale and Need: Youngstown State University asked external consultant Dr. Doreen Edwards, Dean of the Kazuo Inamori School of Engineering at Alfred University and Professor of Materials Science and Engineering to comment on Youngstown's PhD program request, and she summarized the intentions for this program and its alignment with existing efforts in Northeast Ohio:

“Youngstown State University has established a realistic vision for the program. In the proposal for the new degree, YSU has carefully considered how the new degree will distinguish itself from and complement the other materials-related programs in Northeast Ohio. YSU acknowledges the unique strengths of three research intensive universities with materials-related programs: Case Western Reserve University, The University of Akron and Kent State University. Two distinguishing factors of the proposed YSU program are (1) a focus on industrial and manufacturing problems as opposed to more fundamental research and (2) a primary emphasis on hard materials (ceramics and metals) as opposed to polymers. Furthermore, YSU envisions strategic collaborations with other institutions in Ohio that should provide significant benefit to all involved.”

YSU indicates that graduates of the program will experience a blend of science and engineering and will be independent, life-long learners poised to be a resource of creativity to their companies and communities. Graduates will possess the knowledge, skills, experiences and independence expected of PhD graduates, and the business and entrepreneurial acumen to convert their research outcomes into practical results.