

Contact: Diana Gonzalez

**MASTER OF ENGINEERING PROGRAM IN MATERIALS SCIENCE AND ENGINEERING  
NEW PROGRAM REVIEW REPORT**

**Action Requested:** Consider receiving the new program review report for the Master of Engineering Program in Materials Science and Engineering (MSE) at Iowa State University in the College of Engineering.

**Executive Summary:** In 2010, the Board approved the new program whose purpose was to provide an option for students who seek advanced study in materials science and engineering but are not interested in conducting the research required for the Master of Science Program in Materials Science and Engineering. The purpose of this new program review is to present evidence that the program is addressing the goals, objectives, projected student data, and resources identified in the 2010 program proposal. This program review addresses the Board of Regents Strategic Plan priorities to “provide educational excellence and impact as well as economic development and vitality” and Goal #8 – “Iowa’s public universities and special schools shall be increasingly efficient and productive.”

**Background:**

- ◇ **Description of program.** The program offers a non-thesis master’s degree in materials science and engineering. Students have repeatedly requested this, particularly prospective students who are currently employed in industry who want to obtain a graduate degree in materials, but for whom it is not practical to perform the research required for a thesis. The program offers students a more detailed understanding of materials properties, processing, theory, and characterization through an all-coursework, non-thesis program of study. The department of materials science and engineering also offers a bachelor’s degree in materials engineering (Fall 2015 enrollment of 266), a Master of Science degree in materials science and engineering (Fall 2015 enrollment of 105) and a Ph.D. program in materials science and engineering (Fall 2015 enrollment of 140). In addition, the department offers several large scale “service” courses for undergraduate students in other engineering disciplines, as well as a minor in MSE at the graduate level.
- ◇ **Need identified for program.** The program proposal stated, “Materials engineers are expected to have employment growth of 4% over the previous decade, slower than the average for all occupations. Although employment is expected to decline in many of the manufacturing industries in which materials engineers are concentrated, growth should be strong for materials engineers working on nanomaterials and biomaterials. As manufacturing firms contract for their materials engineering needs, employment growth is expected in professional, scientific, and technical services industries also.”<sup>1</sup>
- ◇ **Changes in goals and objectives from program proposal.** None.

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<sup>1</sup> U.S. Bureau of Labor Statistics projected for the decade 2006-2016.

◇ Projected and actual headcount enrollment for past five years.

Fall 2011		Fall 2012		Fall 2013		Fall 2014		Fall 2015	
P	A	P	A	P	A	P	A	P	A
3	0	3	6	4	7	5	3	6	11

The full enrollment target is eight students. In its initial two years, the enrollment approximated that number but there was a drop to three in 2014. Enrollment increased to 11 students in 2015. These fluctuations are expected for a new program. Enrollment has exceeded the projection in the proposal of eight students in seven years.

◇ Total number of credit hours delivered during the past five years.

Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015
0	35	116	43	129

◇ Number of graduates during the past five years.

Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015
0	2	4	2	2

This is a new program so the number of graduates exceeded the 20% level criterion. At graduation, 17% were employed; 100% were employed six months after graduation.

◇ Program strengths.

- ⇒ The program meets a demand for additional course-based training at the graduate level. It also has potential to meet industry needs.
- ⇒ Additional graduate students bring diversity of background and thought into the courses in which they are enrolled and also enable some graduate courses to be offered more frequently which benefits all graduate students.
- ⇒ When talented students are identified, they are converted into thesis-based Master of Science or Ph.D. students.
- ⇒ Industrial participants in the program can help the department forge stronger ties with industrial partners.
- ⇒ The program is growing and is expected to continue to do so. The Fall 2015 enrollment of 11 new students is the largest to-date.

◇ Program concerns. Students do not have a thesis advisor or research group. Therefore, it can be challenging for them to navigate the administrative system and develop a community.

◇ Recommendations. This program requires additional part-time administrative support.

◇ Conclusions. The program meets a demand and enriches the college's graduate program offerings. Few additional resources are required to offer this program, and the tuition income and other benefits to the broader graduate program indicate that it should be continued.

- ◇ Program improvements. A new professional advisor has been hired; he will allocate a portion of his time to help advise this program's students as well as other graduate students regarding department, college, and university requirements. This person has also been tasked to organize professional development opportunities for all graduate students; these opportunities are expected to improve students' career preparation and improve their graduate school experience.
- ◇ Program cost. The program proposal indicated that the program would not incur new costs. *It is difficult to accurately separate revenue and costs among the undergraduate and graduate programs offered by the department. These degree programs share faculty and other departmental resources, as well as revenue streams. In addition, there are students from outside the department who take courses from the department and/or who have formal minors in the department programs.*
- ◇ Major changes planned for the next 2-3 years. The new advisor will develop and implement additional professional development opportunities for all graduate students.
- ◇ Program accreditation. None.
- ◇ Program revenue. Departmental revenue is not disaggregated or tracked at the program level.
- ◇ Assigned program faculty. There are no faculty appointments with responsibilities associated entirely with this program. All courses for the program are shared with the much larger Master of Science and Ph.D. programs of the department.
- ◇ Program expenditures. Expenditures are not disaggregated or tracked at the program level. Due to the relatively small size of this program compared to the other programs in the department, this program has negligible incremental costs.