

# **The Student Learning Outcomes (SLO) of the Manufacturing Minor Degree Kansas State University**

**(updated September 2, 2009)**

## **Student Learning Outcomes**

- Apply Knowledge of mathematics, science and engineering
- Design and conduct experiments & analyze and interpret data
- Design a system, component or process to produce goods and services
- Function on a multi-disciplinary team
- Identify, formulate and solve engineering problems
- Understand professional ethics
- Communicate Effectively
- Understand impact of engineering solutions on society
- Engage in Lifelong learning
- Knowledge of contemporary issues
- Use modern engineering tools

## **Assessment Summary**

The Department of Industrial and Manufacturing Systems Engineering (IMSE) has established a comprehensive set of eleven student learning outcomes (SLOs) for the graduates of our BSIE program. This comprehensive set of SLOs support the maintenance of our ABET accreditation. Each SLO is further broken down into more specific objectives. The assessment of each of

these objectives is mapped to various direct measurement processes; most of which are identified in specific IMSE course components. Direct measures are primarily used to assess the effectiveness of these SLO items. Course components used for assessment include student home work, test problems in exams, written reports, presentations, and participation in seminars, field trips, and team work from various IMSE courses. The IMSE assessment standard is that at least 80% of students earning C or better for each direct measure. Instructors of IMSE courses that have assessment requirements file annual course reports that report results and offer recommendations. The IMSE undergraduate committee reviews the reports and provides recommendations that are shared with the entire IMSE faculty body. Action items are generated to improve student learning and the assessment system during general IMSE faculty meetings and retreats. The IMSE SLOs are reviewed and revised every three years by IMSE faculty with input from the IMSE advisory council and feedback from various constituents. The first version of the IMSE SLOs was established in 1999 and the IMSE faculty made a major change in the definition of our SLOs in 2003 to reflect our better understanding of both SLOs and best practices in direct assessment of SLOs. A subset of IMSE SLOs is mapped to K-State university-wide SLOs. These assessment results are summarized by the IMSE undergraduate committee, discussed with the IMSE faculty and reported annually.

### **Alignment Matrix**

A subset of IMSE SLOs is chosen to map the university SLOs. The following alignment matrix demonstrates the linkage between these two sets of SLOs.

<i><b>Program SLOs</b></i>	<i><b>University-wide SLOs (<u>Undergraduate Programs</u>)</b></i>					<i>Program SLO is conceptually different from university SLOs</i>
	<i>Knowledge</i>	<i>Critical Thinking</i>	<i>Communication</i>	<i>Diversity</i>	<i>Academic / Professional Integrity</i>	
<i>1. Design and conduct experiments &amp; Analyze and interpret data</i>	X	X				
<i>2. Function on a multidisciplinary team</i>				X		
<i>3. Use modern engineering tools</i>	X					