

**Degree Program**  
**Assessment of Student Learning Plan**  
Kansas State University

FEB 17 2005

*received*

- Check the box if your program's student learning outcomes have been modified since November 2003. If so, please email the revised outcomes ([apr@ksu.edu](mailto:apr@ksu.edu)) or attach a hard copy to this document.

**A. College, Department, and Date of this Submission**

College: Engineering  
Department: Mechanical and Nuclear Engineering (MNE)  
Date of Submission: November 5, 2004

**B. Contact Person(s) for the Assessment Plans**

Kevin Lease, Associate Professor and Graduate Program Director  
Mo Hosni, Professor and Department Head

**C. Program – degree, minor, or certification**

Ph.D. in Mechanical Engineering

**D. Assessment of Student Learning Three-Year Plan**

**1. Student Learning Outcome(s)**

Of the eight Graduate Student Learning Outcomes developed and approved by the MNE Faculty (10/03), the department will focus on the following 4 graduate student learning outcomes during our initial 3-year assessment plan.

*Graduates of the KSU MNE Department's Graduate Program, with a PhD Degree in Mechanical Engineering, will possess the following traits:*

- 1. Ability to solve engineering problems using advanced mathematical, scientific, computational, and analytical methods appropriate to the Mechanical Engineering discipline*
- 2. Ability to synthesize and critically evaluate information pertinent to the Mechanical Engineering discipline.*
- 3. Demonstration of expertise in one or more areas of specialization within the Mechanical Engineering discipline.*
- 4. Ability to plan and conduct scholarly activities that make original contributions to the knowledge base in one or more areas of specialization within the Mechanical Engineering discipline.*

Relationship to K-State Student Learning Outcomes (insert the program SLOs and check all that apply):

Program SLOs	University-wide SLOs for Graduate Programs (approved by Graduate Council 12/03)			Program SLO is conceptually different from university SLOs
	Knowledge	Skills	Attitude and Professional Conduct	
1. Ability to solve engineering problems using advanced mathematical, scientific, computational, and analytical methods appropriate to the Mechanical Engineering discipline.	X			
2. Ability to synthesize and critically evaluate information pertinent to the Mechanical Engineering discipline.	X	X		
3. Demonstration of expertise in one or more areas of specialization within the Mechanical Engineering discipline.	X			
4. Ability to plan and conduct scholarly activities that make original contributions to the knowledge base in one or more areas of specialization within the Mechanical Engineering discipline.	X	X	X	

2. How will the learning outcomes be assessed? What groups will be included in the assessment?

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**Outcome #1**

*Ability to solve engineering problems using advanced mathematical, scientific, computational, and analytical methods appropriate to the Mechanical Engineering discipline.*

**Measures/Implementation**

- **Supervisory committee** evaluates student's **written dissertation document**. A **questionnaire** (copy attached), pertaining to the written dissertation document, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - **Supervisory committee** evaluates student's performance on the **PhD preliminary examination**. A **questionnaire** (copy attached), pertaining to the student's performance in the preliminary examination, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - **Supervisory committee** evaluates student's performance on the **final oral examination**. A **questionnaire** (copy attached), pertaining to the student's performance in the final oral examination, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - Instructors of graduate courses provide **grades for student's coursework**. The graduate student's **major professor** will complete a **questionnaire** (copy attached) pertaining to the student's grades in graduate courses at the conclusion of the final examination.
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**Outcome #2**

*Ability to synthesize and critically evaluate information pertinent to the Mechanical Engineering discipline.*

**Measures/Implementation**

- **Supervisory committee** evaluates student's **written thesis/report document**. A **questionnaire** (copy attached), pertaining to the written thesis/report document, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - **Supervisory committee** evaluates student's performance on the **PhD preliminary examination**. A **questionnaire** (copy attached), pertaining to the student's performance in the preliminary examination, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - **Supervisory committee** evaluates student's performance on the **final oral examination**. A **questionnaire** (copy attached), pertaining to the student's performance in the final oral examination, will be completed by each member of the supervisory committee at the conclusion of the final examination.
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### Outcome #3

*Demonstration of expertise in one or more areas of specialization within the Mechanical Engineering discipline.*

#### Measures/Implementation

- **Supervisory committee** evaluates student's **written thesis/report document**. A **questionnaire** (copy attached), pertaining to the written thesis/report document, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - **Supervisory committee** evaluates student's performance on the **PhD preliminary examination**. A **questionnaire** (copy attached), pertaining to the student's performance in the preliminary examination, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - **Supervisory committee** evaluates student's performance on the **final oral examination**. A **questionnaire** (copy attached), pertaining to the student's performance in the final oral examination, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - Instructors of graduate courses provide **grades for student's coursework**. The graduate student's **major professor** will complete a **questionnaire** (copy attached) pertaining to the student's grades in graduate courses at the conclusion of the final examination.
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### Outcome #4

*Ability to plan and conduct scholarly activities that make original contributions to the knowledge base in one or more areas of specialization within the Mechanical Engineering discipline.*

#### Measures/Implementation

- **Supervisory committee** evaluates student's **written thesis/report document**. A **questionnaire** (copy attached), pertaining to the written thesis/report document, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - **Supervisory committee** evaluates student's performance on the **PhD preliminary examination**. A **questionnaire** (copy attached), pertaining to the student's performance in the preliminary examination, will be completed by each member of the supervisory committee at the conclusion of the final examination.
  - **Supervisory committee** evaluates student's performance on the **final oral examination**. A **questionnaire** (copy attached), pertaining to the student's performance in the final oral examination, will be completed by each member of the supervisory committee at the conclusion of the final examination.
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**3. When will these outcomes be assessed? When and in what format will the results of the assessment be discussed?**

Learning Outcomes	Timetable for Assessment of Learning Outcomes			Baseline Created?
	2005	2006	2007	
1. Ability to solve engineering problems using advanced mathematical, scientific, computational, and analytical methods appropriate to the Mechanical Engineering discipline.	<p><i>Questionnaires will be completed at the conclusion of each <b>PhD- ME</b> preliminary examination and final oral examination during the Fall and Spring semesters of this 3-year period.</i></p> <p><i>MNE Graduate Committee will review and discuss the results of the questionnaires at the end of each semester during this 3-year period.</i></p>			3-year baseline data created after 2007 spring semester
2. Ability to synthesize and critically evaluate information pertinent to the Mechanical Engineering discipline.	<p><i>Questionnaires will be completed at the conclusion of each <b>PhD- ME</b> preliminary examination and final oral examination during the Fall and Spring semesters of this 3-year period.</i></p> <p><i>MNE Graduate Committee will review and discuss the results of the questionnaires at the end of each semester during this 3-year period.</i></p>			3-year baseline data created after 2007 spring semester
3. Demonstration of expertise in one or more areas of specialization within the Mechanical Engineering discipline.	<p><i>Questionnaires will be completed at the conclusion of each <b>PhD- ME</b> preliminary examination and final oral examination during the Fall and Spring semesters of this 3-year period..</i></p> <p><i>MNE Graduate Committee will review and discuss the results of the questionnaires at the end of each semester during this 3-year period.</i></p>			3-year baseline data created after 2007 spring semester
4. Ability to plan and conduct scholarly activities that make original contributions to the knowledge base in one or more areas of specialization within the Mechanical Engineering discipline.	<p><i>Questionnaires will be completed at the conclusion of each <b>PhD- ME</b> preliminary examination and final oral examination during the Fall and Spring semesters of this 3-year period.</i></p> <p><i>MNE Graduate Committee will review and discuss the results of the questionnaires at the end of each semester during this 3-year period.</i></p>			3-year baseline data created after 2007 spring semester

**4. What is the unit's process for using assessment results to improve student learning?**

<b>Learning Outcomes</b>	<b>Improvement Plan</b>
<p>1. Ability to solve engineering problems using advanced mathematical, scientific, computational, and analytical methods appropriate to the Mechanical Engineering discipline.</p>	<p><i>MNE Graduate Committee will summarize, review, and discuss the results of the questionnaires (collected from all MS oral final examinations during the semester) at the end of each semester.</i></p> <p><i>MNE Graduate Committee will report to the MNE faculty at the beginning of each semester. The MNE faculty will discuss the results and changes that may be needed if significant weaknesses are discovered.</i></p> <p><i>Future assessments will be compared to the baseline to monitor improvement and stability in students' performance.</i></p> <p><i>At the end of each Spring semester, the MNE Graduate Committee will review the Graduate Student Learning Outcomes, the assessment tools used, and the overall assessment plan. Based on this yearly review, the MNE Graduate Committee will recommend any necessary changes to improve the process.</i></p>
<p>2. Ability to synthesize and critically evaluate information pertinent to the Mechanical Engineering discipline.</p>	<p><i>MNE Graduate Committee will summarize, review, and discuss the results of the questionnaires (collected from all MS oral final examinations during the semester) at the end of each semester.</i></p> <p><i>MNE Graduate Committee will report to the MNE faculty at the beginning of each semester. The MNE faculty will discuss the results and changes that may be needed if significant weaknesses are discovered.</i></p> <p><i>Future assessments will be compared to the baseline to monitor improvement and stability in students' performance.</i></p> <p><i>At the end of each Spring semester, the MNE Graduate Committee will review the Graduate Student Learning Outcomes, the assessment tools used, and the overall assessment plan. Based on this yearly review, the MNE Graduate Committee will recommend any necessary changes to improve the process.</i></p>
<p>3. Demonstration of expertise in one or more areas of specialization within the Mechanical Engineering discipline.</p>	<p><i>MNE Graduate Committee will summarize, review, and discuss the results of the questionnaires (collected from all MS oral final examinations during the semester) at the end of each semester.</i></p> <p><i>MNE Graduate Committee will report to the MNE faculty at the beginning of each semester. The MNE faculty will discuss the results and changes that may be needed if significant weaknesses are discovered.</i></p> <p><i>Future assessments will be compared to the baseline to monitor improvement and stability in students' performance.</i></p> <p><i>At the end of each Spring semester, the MNE Graduate Committee will review the Graduate Student Learning Outcomes, the assessment tools used, and the overall assessment plan. Based on this yearly review, the MNE Graduate Committee will recommend any necessary changes to improve the process.</i></p>
<p>4. Ability to plan and conduct scholarly activities that make original contributions to the knowledge base in one or more areas of specialization within the Mechanical Engineering discipline.</p>	<p><i>MNE Graduate Committee will summarize, review, and discuss the results of the questionnaires (collected from all MS oral final examinations during the semester) at the end of each semester.</i></p> <p><i>MNE Graduate Committee will report to the MNE faculty at the beginning of each semester. The MNE faculty will discuss the results and changes that may be needed if significant weaknesses are discovered.</i></p> <p><i>Future assessments will be compared to the baseline to monitor improvement and stability in students' performance.</i></p> <p><i>At the end of each Spring semester, the MNE Graduate Committee will review the Graduate Student Learning Outcomes, the assessment tools used, and the overall assessment plan. Based on this yearly review, the MNE Graduate Committee will recommend any necessary changes to improve the process.</i></p>