

CRITERION 4. CONTINUOUS IMPROVEMENT

A. Information Used for Program Improvement

All of the information used by the program faculty for assessment or evaluation is posted www.ABETMetEng.org. Any file requested by the program evaluator will be available in hard copy at the time of the visit. The collection, recording, assessment, and evaluation of information for program educational objectives and program outcomes are described below.

Program Educational Objectives: Information for program educational object evaluation is derived from meetings with the Advisory Board, surveys of alumni, and meetings with constituent focus groups. The reports from these groups and the surveys and the program review including actions and accomplishments are stored digitally in the Continuous Improvement System (CIS) computers and uploaded to the CIS website. Access to these files may be attained by contacting the program head Dr. Jon Kellar. (Dr. Howard manages the files and site.)

Program Outcomes: Information for the program outcomes is derived from a wide range of sources (called instruments), including student work, presentations, surveys, exams, etc. To the extent that the source of the information is concrete (viz.-student reports, homework), it is stored in hard copy form in the CIS hard copy archive located in the departmental office, MI 115. Currently, these files approximately fill a four-drawer file cabinet. Each of these hard copy instruments is accompanied by its score card onto which assessment scores are recorded. When abstract information is used to assess outcomes (viz.-presentations, design fairs), the score cards completed by the assessor are filed in the CIS hard copy archives often with a summary document describing the instrument. All of the score card information is recorded and rendered into summary format digitally and uploaded onto the CIS website. Any file requested by the program evaluator will be available in hard copy at the time of the visit.

All objective evaluation and outcome assessment records, compilations, reviews, actions, reports, syllabi, vitae, and other continuous-improved related documents are available on-line: www.ABETMetEng.org. Access is provided by contacting Dr. Jon. Kellar Jon.Kellar@sdsmt.edu.

The previous sections of this report Criterion 2 and 3 describe the process by which assessment and evaluation is performed. To assist the program evaluator in finding and indicating the documents need to review the program's processes, a summary of the salient documents is listed here with a brief description of each. They are listed in the order in which information flows.

Program Outcomes

Each of the below items is a document except for abstract instruments such as an oral presentation.

Instrument

is the collection of a specific document, one per student or team, used to assess a Program Outcome. Examples of the specific document may be a completed homework assignment or an exam, faculty member-completed oral presentation assessment form, or students' standardized exam results.

Score Card

is a Microsoft Excel table document on which the Program Outcome assessment results for one instrument are recorded. These are typically completed by one designated faculty assessor.

Outcome Summary

is a Microsoft Excel table document for a specified Program Outcome onto which the all the Score Card assessment results for the specified outcome are summarized and tabulated for one calendar year.

Assessment Summary

is a Microsoft Excel document consisting of a Table and a Chart onto which all Program Outcomes results are organized for one academic year.

Grand Summary

is a Microsoft Excel document that shows the assessment results for all outcomes over all years, any one outcome over time, or all outcomes for any selected year.

Outcome Review

is a Microsoft Excel worksheet onto which a designated Met Eng faculty member documents his critical review of a selected Program Outcome for a specified academic year and includes actions needed.

Outcome Review Summary

is a Microsoft Excel worksheet that contains a complete sequential history of the evaluation, actions, and results for one outcome review for all years.

Program Educational Objectives

Each of the below items is a document.

Alumni Survey

is the result of Survey Monkey on-line surveys that are downloaded and stored in the CIS digital archive.

Constituent Focus Group Report

is the report written by an on-campus professional who conducted the oral exchange with the focus group.

Advisory Board Report

is the report submitted by the board upon completion of their review of the department, which includes a review of the BS metallurgical engineering program.

Faculty Review of Program Objectives

is the report prepared by the program faculty upon review of the above information and includes the setting of new actions and implementation plans and the evaluation of previous actions.

B. Actions to Improve the Program

The actions taken to assure continuous improvement are summarized below first by program education objectives followed by program outcomes.

Program Educational Objectives

Program personnel conduct a formal evaluation of program objectives every three years. However, in the intervening period the faculty members are in frequent (weekly to monthly) discussion concerning the means of achieving them through the actions identified previously as well as identifying new actions that may need to be stated at the forthcoming review. Major themes since 2004 have focused on

- Communication skills
- Ethics and professionalism
- Global issues
- Professional and community service
- Design skills
- Computational skills.

Additionally, the evaluation process reveals procedural improvements that are also implemented as part of the Continuous Improvement System (CIS).

Tables 4-1, 4-2, 4-3 are the Program Educational Objective Reviews completed by the program faculty for 2004, 2007, and 2009.

Program Outcomes

Program personnel conduct an annual evaluation of assessment data. The review consists of individual faculty members reviewing selected outcome data and writing an Outcome Summary. This summary has been a Microsoft Word® file but more recently a transition to a Microsoft Excel® file was undertaken to improve automation in the creation of Outcome Summary Reviews. In either case, the information recorded is the same. The faculty member preparing the summary leads a discussion on the evaluation of the outcome in CIS meetings. The discussion includes the degree to which previous action items have been achieved. After thorough consideration of the summary including needed new actions, the faculty member submits the completed and approved summary to the CIS officer (Dr. Howard). The summary is then entered into the CIS system which adds the latest year's evaluation to the previous year's evaluations to create the longitudinal Outcome Review Summary. The combined efforts of the faculty members results in all outcomes being reviewed and evaluated. Assigning each faculty member specific outcomes, fosters a sense of ownership and expertise valued by fellow faculty members. Table 4-4 shows the longitudinal Outcome Review Summaries for outcomes (a)-(k).

Appendix E contains the following additional assessment and evaluation documents:

Program Outcomes

- Outcome metrics
- Assessment Summaries
- Grand Summary graphical renderings of each outcome over time
- Outcome Review
- Outcome Review Summary

Program Educational Objectives

- Alumni Survey 2008
- Constituent Focus Group Report 2009
- Advisory Board Reports 2007, 2009

Outcome Summaries are not include in the self study but are available from the website within the Grand Summary tabs under the *Outcome Assessment/Results/Grand Summary* website menu and available on request. There are eleven Microsoft Excel® charts per year.

Table 4-1 Program Educational Objective Reviews for 2004

2004 Evaluation of Program Objectives Summary	5/7/2004
<p>Evaluation Instruments includes</p> <ul style="list-style-type: none"> • Recent Outstanding Graduate Awards • Percentage Practicing Met Graduates • Alumni Survey • Employer Survey • Alumni Advancement • Depart Adv Board Report • Other Departments/Centers Input <p>After a long discussion, it was decided that these are to be combined as follows:</p> <ul style="list-style-type: none"> • Alumni Survey (Alumni Advancement, Percentage Practicing Met Grad) • Employer Survey • Department Advisory Board Report • Recent Graduate Awards • Other Departments/Centers <p>Other departments and centers' input regarding our current students performance is not a direct measure of the success of our objectives. However, it can serve as an indication pre-graduation satisfaction of Program Objectives</p> <p>There are two categories in the evaluation of the objectives: 1) the improvement of system to make the evaluation more effective in the future and 2) the action items as results of the evaluation.</p>	
Actions for 2004	
Evaluation Process	
<ul style="list-style-type: none"> • We have reasonable number of return on the alumni survey but only two employer surveys were received. More data on employer survey is critical. Furthermore, survey questions are to be aligned more closely with the Program Objectives rather than with the currently alignment with Program Outcomes. • The alumni survey questions may focus more in relation to program objectives rather than outcomes in the future survey. Also, survey questions are to be aligned more closely with the Program Objectives rather than with the currently alignment with Program Outcomes. 	
Objective Improvement	
<ul style="list-style-type: none"> • Curriculum should be improved to make communication skills better. This action is closely related to an Outcome Assessment Action Items and is thereby slated for improvement action. • More emphasis should be given in ethics, professionalism and global issues. This action is closely related to an Outcome Assessment Action Items and is thereby slated for improvement action, primarily in MET 310 and MET 321. 	

Table 4-2 Program Educational Objective Reviews for 2007

<p>2007 Program Educational Objectives Review</p> <p>The Advisory Board met on Dec 2, 2007 to review the department's mission:</p> <ul style="list-style-type: none">• Provide a quality program leading to the degree B.S. in Metallurgical Engineering• Participate in multi-disciplinary programs leading to the M.S. and Ph.D. degree programs in materials engineering and science• Contribute to the expansion of knowledge in the area of materials and metallurgical engineering through scholarly activities• Help local, regional, national and international materials and metallurgical industries through research and development activities <p>As part of the first mission statement the board reviewed progress towards meeting the B.S. Metallurgical Engineering program educational objectives:</p> <ul style="list-style-type: none">• Successfully apply metallurgical engineering principles in their employment• Meet societal needs through science and technology• Grow professionally and personally• Serve their profession and community <p>The board concluded:</p> <ul style="list-style-type: none">• There was no need to modify the department mission or the program educational objectives.• The program had successfully negotiated the retirement and replacement of three faculty members.• The department needs to assure adequate undergraduate enrollment to avoid the threat of program sanctions or closure. A goal of 80 students is a reasonable goal.• Being a strictly metallurgical engineering undergraduate program is a useful niche. <p>The program faculty reviewed the Advisory Board Report.</p> <p>Loop closure on the 2004 Actions is summarized here.</p> <p>2004 Evaluation Process Actions Completed</p> <ul style="list-style-type: none">• Employer feedback on program alumni is now obtained through the population of the Advisory Board with employers of the alumni. This avoids the confidentiality difficulties that arose from employer surveys while providing direct quality feedback on alumni performance.• Alumni survey questions have been directly aligned with the program educational objectives rather than with the previous incorrect alignment with program outcomes.• Program educational objective evaluation is now designed to receive input from alumni surveys, and constituent focus groups, and the Advisory Board. Actions to improve attainment of the program educational objectives will be determined by the program faculty. <p>2004 Objective Improvement Actions Completed</p> <ul style="list-style-type: none">• The pre-retirement faculty implemented a demanding laboratory rewrite process in selected program laboratories. This expectation is clear to the new faculty and associated training and review procedures for all faculty members are established.• At least one class period equivalent per program course is now expected so as to distribute ethics across the curriculum.• Students receive instruction in global issues in MET 310 and MET 321 and are required to write a paper with elements of global issues.
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Table 4-2 Program Educational Objective Reviews for 2007 (Continued)

2007 Program Educational Objective Actions
<p>Evaluation Process</p> <ul style="list-style-type: none">• Employer Surveys continue to be difficult to obtain because employers are increasingly hesitant to provide confidential information. Therefore, the employer survey will be abandoned in favor of interview input from interviewers and our alumni who employ SDSM&T graduates. The established relationships we have with interviewers and employing alumni will promote the unfettered input.• Employer survey questions continue to be aligned closely with the Program Objectives rather than with the currently alignment with Program Outcomes.• Alumni survey questions are now aligned closely with the Program Objectives.• Alumni surveys are to go online using Survey Monkey.• Survey Monkey needs to be written to complete objective evaluation for SDSM&T Departments, SDSM&T student.• The Student Satisfaction-Importance (SSI) survey should be renamed the Non-Program Alumni Satisfaction Survey and be limited to those non-program alumni since they are surveyed elsewhere. <p>Implementation Plan</p> <ul style="list-style-type: none">• Populate the Advisory Board with employers and use input from the Alumni Survey and the board to evaluate program objectives.• Rewrite the Alumni Survey to include direct align with program objectives.• Purchase (subscribe to) Survey Monkey.• Determine if the SSI Survey is worth the effort and, if so, work for better participation and definition of the results. <p>Objective Improvement</p> <ul style="list-style-type: none">• A new President will likely restate and reformat the institutional Goals and Objectives. Therefore there will be a need to remap the Program Objectives to any restated Institutional Goals and Objectives.• Communication skills may suffer during program faculty transition. After transition, the program should establish common understanding of writing and oral communication goals.• The effectiveness of the newly implemented modules on ethics, professionalism, and global issues need to be assessed. <p>Implementation Plan</p> <ul style="list-style-type: none">• Participate in campus visioning and offer input so as to maintain our establish objectives.• Train new faculty in writing expectations and procedures.• Assess ethics, professionalism, and global issues on the Senior Exit Exam to assure alumni are prepared to achieve the program educational objectives related to these topics.

Table 4-3 Program Educational Objective Reviews for 2009

2009 Program Educational Objectives Review

The Advisory Board met on October 16, 2009 to review the department's mission:

- Provide a quality program leading to the degree BS in Metallurgical Engineering
- Participate in multi-disciplinary programs leading to the MS and PhD degree programs in materials engineering and science
- Contribute to the expansion of knowledge in the area of materials and metallurgical engineering through scholarly activities
- Help local, regional, national and international materials and metallurgical industries through research and development activities

As part of the first mission statement the board reviewed progress towards meeting the BS Metallurgical Engineering program educational objectives:

- Successfully apply metallurgical engineering principles in their employment
- Meet societal needs through science and technology
- Grow professionally and personally
- Serve their profession and community

The board concluded:

The program educational objectives remain current and appropriate. Alumni surveys and feedback from board members on the program's alumni performance in the workplace indicate that the objectives are being met and that no specific changes in curriculum beyond the suggestions below are needed.

- The department should consider offering one or two survey classes on the larger materials topics such as ceramics, biomaterials, polymers, electronic materials, composites, etc. and
- It is critical that the proper replacement be found for Dr. Howard as he nears retirement and that this transition proceeds as smoothly as possible.
- Some class space, laboratories, and offices need infrastructure upgrades and repair to meet current standards. There have been some new additions of equipment to the Departmental laboratories in recent years, but not a lot of change. While expensive and difficult to do, the faculty and school need to ensure that laboratories are current so the students can be adequately prepared for future jobs or additional training at research universities.
- The Department should continue to emphasize and expand opportunities for students to work in summer or co-op jobs to gain experience.
- The department should work to obtain another funded faculty position. Faculty numbers are still low for the number of enrolled students and the level of research funding being performed. Many MSE departments have student to faculty ratios of about 12:1. This department is approximately 16:1. With five faculty members, the department is always just one step away from a dilemma should a member be lost. Adding another faculty member with the correct skill set could also be a method to broaden the department's range of abilities and class offerings.

The program faculty reviewed the Advisory Board Report, the 2008 Alumni Survey (attached), and the feedback from the 2010 Constituent Focus Group.

Table 4-3 Program Educational Objective Reviews for 2009 (Continued)

Loop closure on the 2007 Actions is summarized here.

2007 Evaluation Process Actions Completed

- The best means of obtaining input from employers of our program alumni is to sit the employers on our Advisory Board. This eliminates violation confidentiality of personnel matters (for their employees – our alumni) while maintaining a direct link to our alumni performance. This is working well and will continue.
- Alumni survey questions using Survey Monkey were aligned directly with the program objectives in the 2008 survey as shown below. This allows excellent evaluation of program objectives. This survey procedure will continue unchanged.
- The Student Satisfaction-Importance Survey (SSI) results were reviewed by the program faculty and found to be of no significant use in the evaluation of program educational objectives. The survey will be used to formulate a program-created survey of program students to better assess student satisfaction. The SSI will no longer be considered for use in program objective assessment.

2007 Objective Improvement Actions Completed

- The new administration and faculty have completed a review and restatement of the university mission and objectives. The remapping of program objectives to the newly-stated university objections has been completed.
- Communication skills were correctly identified as an area that was going to require special attention during turnover of the program faculty. The retirements of Drs. Stone and Han were particularly significant since they were heavily involved in supporting writing skill improvements. The new faculty has been trained in program expectations and procedures to assure the continued writing competence of program graduates. Instructional documents have been created and shared among program faculty to improve uniformity in expectations. Writing and oral communication instruction is discussed at least monthly at departmental meetings. All program faculty members sit in the every design reports meeting where they offer presentation criticism and instruction.
- The senior exit exam and survey now provide satisfactory feedback to assess ethics, professionalism, and global issues. (The alumni survey continues to be useful in evaluating program educational objectives.)

2009 Program Education Objective Actions

Evaluation Process

The evaluation process is working well and requires no modification except for some question about the consistency in alumni survey responses on profession service. Only 5/51 report serving a professional society, while 15/51 report belonging to a professional society. This and other similar analysis indicate that some additional work might be warranted to assure the meaningfulness of the survey questions in these areas.

Objective Improvement

Program graduates appear to meeting all program objectives according to their self-assessment reporting largely either a *satisfied* or *very satisfied* on all items except those involving design and computational. Of additional concern was that 8/51 respondents reported no significant professional or community service. The low self appraisal for design ability is needs to be tracked to determine if the new design experience being offered since 2008 will, as expected, result in improvement. It is decided that the following actions items be set:

- A determination of the effectiveness of the Samurai Sword Design Project and current other design projects are leading to improved design skills for the graduates.
- Consideration should be given to specifically addressing computational skills in the curriculum.
- The program should include additional discussion in the classroom on the importance of and means of identifying areas of meaningful professional and community service.

Table 4-4 Outcome Summary Review for Outcomes (a)-(k)

The following pages contain the Outcome Summary Reviews for the Outcomes

- a) Apply Knowledge of Math, Science, and Engineering
- b) Design and Conduct Experiments and Analyze and Interpret Data and Information
- c) Optimally Select Material and Design Materials Treatment and Production Processes
- d) Function Well on Teams
- e) Identify, Formulate, and Solve Engineering Problems
- f) Know Professional and Ethical Responsibilities and Practices
- g) Communicate Effectively
- h) Know Engineering's Global Societal Context
- i) Engage in Life-Long learning
- j) Know Contemporary Issues
- k) Use Engineering Techniques, Skills, and Tools

Action Review for Outcome (c) Optimally select material and design materials treatment and production processes

2004

Previous Curriculum Action Review Summary

No Curriculum Action needs were stated for Outcome (c) in 2004.

Curriculum Review Summary

- Students continue to perform well.
- No Curricular Action is needed.

Code	Curriculum Action Title	Curriculum Action Brief Description
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N		
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Previous Assessment Process Action Review Summary

There was no previous Assessment Process Action needed for 2004

Assessment Process Review Summary

- Assessment instruments appear to be working well but additional methods are likely to improve assessment.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
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A	Develop Better Instruments for Outcome (c)	Outcome (c) assessment could be improved by adding additional instruments such as a survey or exit exam.
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2005

Previous Curriculum Action Review Summary

There were no Curricular Actions needed for Outcome (c) in 2005.

Curriculum Review Summary

- The students continue to perform well.
- No Curriculum Action is needed

Code	Curriculum Action Title	Curriculum Action Brief Description
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A	Develop a Senior Exit Exam	A Senior Exit Exam is needed to achieve better Assessment of Outcome (c).
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Previous Assessment Process Action Review Summary

Developing better or additional Instruments for all Outcomes was an Assessment Process Action needed for 2005. The Senior Survey provides non-faculty subjective inputs for Outcome (c)

Assessment Process Review Summary

- There is some concern that there is too much reliance on the Senior Design Reports for the assessment of Outcome (c).
- The continued general search for better metrics for all Outcomes is also noted here and should be addressed by development of a Senior Exit Exam.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
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A	Develop a Senior Exit Exam	A Senior Exit Exam needs to be developed to improve the Assessment Process for Outcome (c).
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2006

Previous Curriculum Action Review Summary

There were no Curriculum Actions for Outcome (c) in 2006.

Curriculum Review Summary

No Curriculum Action is needed for Outcome (c) in 2006.

Code	Curriculum Action Title	Curriculum Action Brief Description
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N		
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Previous Assessment Process Action Review Summary

A need for improved Assessment Process for Outcome (c) in the form of a Senior Exit Exam is an ongoing process improvement. Dr Howard will assume responsibility for coordinating this effort.

Assessment Process Review Summary

- Development of a Senior Exit Exam would improve the assessment of Outcome (c).

Code	Assessment Process Action Title	Assessment Process Action Brief Description
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A	Local Senior Exit Exam	Develop a Senior Exit Exam to be administered to seniors as they near graduation so as to gain objective assessment results specifically covering as many metrics as possible.
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2007

Previous Curriculum Action Review Summary

There were no Curriculum Actions for Outcome (c) in 2007.

Curriculum Review Summary

- Student performance is essentially unchanged.
- As noted for other outcomes, there is a general need for the new faculty to be trained in the Continuous Improvement Process and mentored in the curriculum interfaces. Variations in either of these items could explain the noted recent declines in outcome scores and so are noted here and in the Assessment Process review.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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Previous Assessment Process Action Review Summary

- The 2006 Assessment Process Actions Needed called for the development and implementation of a Local Senior Exit Exam, now termed the Local Exam given to all seniors as they near graduation (usually during their last few weeks of course work). This action was completed during the year and is used for many Outcomes including Outcome (a). It is an excellent objective measurement.
- As noted for other outcomes, there is a general need for the new faculty to be trained in the Continuous Improvement Process and mentored in the curriculum interfaces. Variations in either of these items could explain the noted declines in outcome scores and so are noted here and in the Assessment Process review.

Assessment Process Review Summary

- Assessment triangulation was achieved for Outcome (c) assessment. There is some concern by some faculty members that the program may become too reliant on the Senior Exit Exam (Local Exam).

- Training of new faculty in the Continuous Improvement Process is needed to provide for the consistent scoring via metrics.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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A	New Faculty Continuous Process Training	New faculty will be trained in the program's Continuous Improvement Process and practices.
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2008**Previous Curriculum Action Review Summary**

- As suggested for 2008, new faculty have undergone mentoring and training for the classroom and curriculum interfaces.

Curriculum Review Summary

- Students are performing well.
- There are no needed Curriculum Actions for 2009.

- Faculty training and mentoring is an ongoing departmental process and will no longer be mentioned specifically.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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N		
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Previous Assessment Process Action Review Summary

- As suggested for 2007, new faculty have undergone training in the program's Continuous Improvement assessment processes and practices.
- Faculty training in the Continuous Improvement Process is now an ongoing departmental process and will no longer be mentioned specifically.

Assessment Process Review Summary

- Students are performing well.
- There are no needed Assessment Process Actions for 2009.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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C	Continued Faculty Training and Mentoring	New faculty are being trained in the program's Continuous Improvement assessment processes and practices.
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2009**Previous Curriculum Action Review Summary**

- Students were performing well.
- There were no needed Curriculum Actions for 2009.

Curriculum Review Summary

- Student performance mirrored that of 2009, which itself was at a high level.
- No recommended Curricular Actions are necessary for 2010.

N	No action required.	
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Previous Assessment Process Action Review Summary

- Students were performing well.
- There were no needed Assessment Process Actions for 2009.

Assessment Process Review Summary

- Students continued to perform well with on this outcome.
- The tools used to assess this outcome are varied and robust.
- No recommended Assessment Process Actions needed for 2010.

N	No action required.	
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Action Review for Outcome (d) Function well on teams**2004****Previous Curriculum Action Review Summary**

- There were no Curriculum Actions Needed for 2004.

Curriculum Review Summary

- Students are performing very well in teams.
- There is no Curriculum Action Needed for 2005

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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N		
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Previous Assessment Process Action Review Summary

- Seeking better instruments for Outcome (d) were suggested as an Assessment Process Action at the end of 2003 for Outcome (d) during 2004. Instruments were the specific target, not metrics.

Assessment Process Review Summary

- The instruments for Outcome (d) seem to be functioning adequately at the end of 2003. There remains an interest in moving to more objective (relative to faculty assessment) measures of student performance perhaps using student's self-reported teaming experience.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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A	Better Assessment of Outcome (d)	Develop student-reported score assignment instruments of team experience to assess Outcome (d).
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2005**Previous Curriculum Action Review Summary**

- There were no 2005 Curriculum Actions stated for 2006.

Curriculum Review Summary

- Student performance improved slightly but likely within the range of expected uncertainty in performance measurement for Outcome (d).
- No Curriculum Action is needed.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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Previous Assessment Process Action Review Summary

- The Assessment Process Actions for Outcome (d) for 2005 was the general action that all faculty members consider producing metrics that provide for more reliable measures of student achievement. For Outcome (d) this has taken the form of using self assessment to determine the students' team experience in design courses.

Assessment Process Review Summary

- The current cadre of instruments appears to be good tools for assessing Outcome (a).
- The faculty are again asked to continually seek better measures of student performance.
- The self assessment procedure is an excellent assessment instrument for this objective (faculty play no role in determining the assessment score) results are obtained.
- A Senior Exit Exam would also be an improvement in that it would yield objective results in which the faculty would play no role in determining the assessment scores.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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A	Develop a Senior Exit Exam	A Senior Exit Exam is needed to achieve better Assessment of Outcome (d).
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2006**Previous Curriculum Action Review Summary**

- There were no 2006 Curriculum Actions stated for 2007.

Curriculum Review Summary

- Student performance improved slightly but likely within the range of expected uncertainty in performance measurement for Outcome (d).
- No Curriculum Action is needed.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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Previous Assessment Process Action Review Summary

A need for an improved Assessment Process for Outcome (d) in the form of a Senior Exit Exam is an ongoing process improvement. Dr Howard will assume responsibility for coordinating this effort.

Assessment Process Review Summary

- The current cadre of instruments appears to be good tools for assessing Outcome (d). The faculty are again asked to continually seek better measures of student performance.
- The current Assessment Processes should be continued to assess Outcome (d), but other objective assessment data are needed.
- A Senior Exam should be developed as was recommended last year.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
A	Local Senior Exit Exam	Develop a Senior Exit Exam to be administered to seniors as they near graduation so as to gain objective assessment results specifically covering as many metrics as possible.

2007**Previous Curriculum Action Review Summary**

- There were no Curriculum Actions Needed for 2007 for Outcome (d)

Curriculum Review Summary

- The drop in Outcome (d) assessment scores from 2005 and 2006 may be related to different reviewers as faculty turnovers occur. These scores are mostly determined by student input so are not as sensitive to faculty input and training as are other outcomes.
- Nevertheless, faculty training in the Continuous Improvement Process is essential and should continue.
- The new Senior Exit Exam is attempts to use several metrics to assess Outcome (d).

Code	Curriculum Action Title	Curriculum Action Brief Description
A	New Faculty Continuous Process Training	New faculty will be trained in the program's Continuous Improvement assessment processes and practices.

Previous Assessment Process Action Review Summary

- The 2006 Assessment Process Actions Needed called for the development and implementation of a Local Senior Exit Exam, now termed the Local Exam given to all seniors as they near graduation (usually during their last few weeks of course work). This action was completed during the year and is used for many Outcomes including Outcome (d). It is an excellent objective measurement.
- As noted for other outcomes, there is a general need for the new faculty to be trained in the Continuous Improvement Process and mentored in the curriculum interfaces. Variations in either of these items could explain the noted declines in outcome scores and so are noted here and in the Assessment Process review.

Assessment Process Review Summary

- The drop in scores from 2005 and 2006 may be related to different reviewers as faculty turnovers occur. Faculty training in the Continuous Improvement Process is essential and should continue with renewed emphasis.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
A	New Faculty Continuous Process Training	New faculty will be trained in the program's Continuous Improvement assessment processes and practices.

2008**Previous Curriculum Action Review Summary**

- As suggested for 2007, new faculty have undergone training in the program's Continuous Improvement assessment processes and practices.
- Faculty training in the Continuous Improvement Process is now an ongoing departmental process and will no longer be mentioned specifically.

Curriculum Review Summary

- Student performance continues to decline. This may be the result of the assessed cohort's academic variation with the academically superior 2005/6 cohort. This suggests the possible normalization of outcome assessment results with cohort GPA's; however, that data is not readily available to the program from institutional databases.
- The most likely cause for performance decline is the recent turnover in program faculty.
- A watch of performance is warranted. If improvement is not seen in the coming year, action will be needed.

Code	Curriculum Action Title	Curriculum Action Brief Description
W	Senior Exit Exam vs. Other Instruments	Determine if the Senior Exit Exam agrees with the other Instruments.

Previous Assessment Process Action Review Summary

The Assessment Process Action recommended for 2008 was that new faculty would be trained in the program's Continuous Improvement assessment processes and practices. This has been adopted as an ongoing departmental process and will no longer be mention specifically.

Assessment Process Review Summary

The assessment process for Outcome (d) has evolved over the last several years from an assessment largely by faculty to one largely by the students through surveys. The primary concern at this time is whether student's opinions concerning the workings of the design teams are a legitimate measure of teaming skills and the proper balance between teaming knowledge and skills. This will be watched and further considered over 2009.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
W	Teaming Experience vs. Skills	Are the students knowledgeable about teaming skills and do teaming experiences measure this?

2009

Previous Curriculum Action Review Summary

Since the performance of this category had been decreasing, it was decided to "watch" the results during this review period to see if the declination continued. The slight decrease during the previous two years was attributed to academically superior 05/06 cohort and the recent turnover of the program faculty.

Curriculum Review Summary

The assessment results increased slightly during this review period indicating there was a normalization of the outcome assessment from previous cohorts and the new faculty.

N	No action required.	
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Previous Assessment Process Action Review Summary

The primary concern for 2009 was whether the student's opinions concerning the workings of the design teams are a legitimate measure of teaming skills and the proper balance between teaming knowledge and skills.

Assessment Process Review Summary

In the future additional teaming and conflict resolution issues will be addressed in the design courses by either faculty in the department or by faculty from other departments.

W	Working well with others	Additional materials to be taught in Design courses.
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Action Review for Outcome (e) Identify, formulate, and solve engineering problems**2004****Previous Curriculum Action Review Summary**

No Curriculum Action needs were stated for Outcome (e) for 2004.

Curriculum Review Summary

Student performance appears to be at a satisfactory level. A slight decrease is noted compared to the previous two years.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

Previous Assessment Process Action Review Summary

- There was no previous Assessment Process Actions needed for 2004.

Assessment Process Review Summary

- Assessment instruments appear to be working well with consistent agreement between instruments.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

2005**Previous Curriculum Action Review Summary**

- No Curriculum Actions were identified for Outcome (e) for 2005.

Curriculum Review Summary

- Students continue to perform well solving engineering problems.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>

Previous Assessment Process Action Review Summary

- No Assessment Process Action was needed for Outcome (e) for 2005.

Assessment Process Review Summary

- Process seems adequate.
- A small number of instruments were used.
- Additional instruments may need to be added because of small number during odd years.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
W	Small Number of Instruments	* A small number of instruments are used to assess Outcome (e) in odd years, additional instruments may need to be added in odd years.

2006**Previous Curriculum Action Review Summary**

- No Curriculum Actions were identified for Outcome (e) for 2006.

Curriculum Review Summary

- Students continue to perform well.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

Previous Assessment Process Action Review Summary

- No Assessment Process Action was needed for Outcome (e) for 2006.

Assessment Process Review Summary

- Process is adequate with good agreement between instruments.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

2007**Previous Curriculum Action Review Summary**

- No Curriculum Actions were identified for Outcome (e) for 2007.

Curriculum Review Summary

- Students continue to perform well solving engineering problems.
- The senior class of 2007 had a very high GPA. It is noted to watch performance for next year.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
W	High GPA of 2007 Class	* Watch student performance in Outcome (e) in 2008.

Previous Assessment Process Action Review Summary

- No actions were proposed for 200

Assessment Process Review Summary

- Assessment process appears adequate.
- In 2005, it was noted that only a small number of instruments were used in odd years. This has been addressed by adding questions to the Local Exam.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

2008

Previous Curriculum Action Review Summary

- No Curriculum Actions were recommended.
- It was recommended to watch student performance in 2008 because of high GPA of 2007 graduating seniors.

Curriculum Review Summary

- Student performance remains at a consistently high level for Outcome (e).

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

Previous Assessment Process Action Review Summary

- There was no previous Assessment Process Action needed for 2008.

Assessment Process Review Summary

- Assessment process for Outcome (e) seems to be working well.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>

2009

Previous Curriculum Action Review Summary

- No Curriculum Action was suggested.

Curriculum Review Summary

- Student performance seems satisfactory.

N	No action required.	
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Previous Assessment Process Action Review Summary

- No Assessment Process actions were suggested.

Assessment Process Review Summary

- It is noted that the Senior Survey indicates that the students are confident in their abilities to solve engineering problems; however, Local Exam results indicate a different picture. This may indicate students are not doing as well as they think.

W	Local Exam vs. Senior Survey	* Local Exam results are much lower than Senior Survey. This difference may need to be watched in the future.
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Action Review for Outcome (f) Know professional and ethical responsibilities and practices**2004****Previous Curriculum Action Review Summary**

Meshing Ethics across the curriculum was a required Curriculum Action. This has been implemented in MET 310, MET design, and emphasized in Material Advantage meetings. Ethics canons have also been broadcast on the department's Daktronics board.

Curriculum Review Summary

The outcome summary of ABET criterion (f) for 2004 indicated an increase in student performance. The number of assessments increased from 2 to 32.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N	No action needed	Scores were greatly improved as was the number of metrics

Previous Assessment Process Action Review Summary

No items specific to Assessment Process Action Review for ABET criterion (f) were noted.

Assessment Process Review Summary

The FE Exam was only taken by one student. If few students are consistently taking the exam, its inclusion in the assessment process may not be appropriate

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
W	FE Exam Numbers	The number of students taking the FE Exam is small.

2005**Previous Curriculum Action Review Summary**

No items specific to Curriculum Action Review for ABET criterion (f) were noted.

Curriculum Review Summary

The scores continued to increase, but the number of assessments was low.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

Previous Assessment Process Action Review Summary

No items specific to Assessment Process Action Review for ABET criterion (f) were noted.

Assessment Process Review Summary

The number of assessments were rather low.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

2006**Previous Curriculum Action Review Summary**

No items specific to Curriculum Action Review for ABET criterion (f) were noted.

Curriculum Review Summary

The students scores were high again in 2006 and an increase in total number of assessments was noted.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

Previous Assessment Process Action Review Summary

No items specific to Assessment Process Action Review for ABET criterion (f) were noted.

Assessment Process Review Summary

The number of assessments were significantly increased.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

2007**Previous Curriculum Action Review Summary**

No items specific to Curriculum Action Review for ABET criterion (f) were noted.

Curriculum Review Summary

The student's performance was split between areas in which said students performed exceedingly well and those in which they performed adequately.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

Previous Assessment Process Action Review Summary

No items specific to Assessment Process Action Review for ABET criterion (f) were noted.

Assessment Process Review Summary

The number of assessment instruments are now plentiful, but the split in the scores indicates that more direct assessment of ethics may be desirable.

Code Assessment Process Action Title Assessment Process Action Brief Description

N		
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2008

Previous Curriculum Action Review Summary

No items specific to Curriculum Action Review for ABET criterion (f) were noted.

Curriculum Review Summary

The level of the students was very good. The number of assessments was also quite good.

Code Curriculum Action Title Curriculum Action Brief Description

N		
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Previous Assessment Process Action Review Summary

No items specific to Assessment Process Action Review for ABET criterion (f) were noted.

Assessment Process Review Summary

While the number of instruments was good, few students took the FE exam. As the FE exam provides direct assessment of material relevant to Outcome (f), more students should be encouraged to take the FE Exam.

Code Assessment Process Action Title Assessment Process Action Brief Description

N		
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2009

Previous Curriculum Action Review Summary

No Previous Curriculum Action Review Items were noted from 2008.

Curriculum Review Summary

For 2009, the curriculum in MET 465 (Design Reports) seems to have underemphasized ethics. However, the other methods indicate good performance in Outcome (f).

A	MET 465 Design Reports	Re-emphasize ethics
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Previous Assessment Process Action Review Summary

No Previous Assessment Process Action Reviews were noted from 2008.

Assessment Process Review Summary

The Assessment Process shows that Outcome (f) is adequately covered by the current instruments, once the issue with the design reports is dealt with.

N		
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Action Review for Outcome (g) Communicate effectively

2004

Previous Curriculum Action Review Summary

- Report Rewriting (g) – The program faculty will redouble their efforts to require more effort in writing “perfect” reports. This is expected to replace total report quantities submitted with higher quality. The premise of this action is that students gain more writing skill by focused effort on a high-quality work rather than a more diffuse effort with less faculty feedback. Dr. Kellar will periodically require faculty reports on progress on this action item from all program faculty members.

- Seminar Series – The faculty believe that students will gain a better understanding of professional behavior, the need for honed communication skills, and better interaction and assimilation skills through a more active seminar series offered by a combination of off-campus invited speakers and presentations by their peers. Dr. Kellar will appoint a faculty member to complete this task.

Curriculum Review Summary

- Outcome (g) scores remained at a high performance level.

Code	Curriculum Action Title	Curriculum Action Brief Description
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N	No Action	
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Previous Assessment Process Action Review Summary

- There was no specific Assessment Process Action specified at the end of 2003 for Outcome (g) during 2004

Assessment Process Review Summary

- there was a discussion on the need to develop new instruments to assess outcome (g) beyond course work but no action was deemed necessary.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
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N	No Action	
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2005

Previous Curriculum Action Review Summary

The curriculum review indicated that student performance was at a high level.

Curriculum Review Summary

- During this review cycle it was determined that the students communicate effectively, particularly orally.

- Attention should be given to student written communication skills. Using re-writing as a technique to improve written skills is a strategy that should be pursued.

Code	Curriculum Action Title	Curriculum Action Brief Description
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C	Rewriting as a method to improve written communication.	Faculty will utilize the re-writing technique to improve student skills.
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Previous Assessment Process Action Review Summary

- Better Metric matching

Assessment Process Review Summary

- The assessment process appears to be working well.

- There are enough and varied instruments to adequately review both the oral and written components to the communication outcome.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
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N	No action required.	
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2006

Previous Curriculum Action Review Summary

- No actions were identified, curriculum assessment process appears to be performing adequately.

Curriculum Review Summary

- The curriculum is performing adequately. Generally lower scores were reported for the senior level instruments that were utilized compared to the Jr/Sr and Soph instruments that were used.

Code	Curriculum Action Title	Curriculum Action Brief Description
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N	No action required	
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Previous Assessment Process Action Review Summary

- No action was required of the assessment process for this metric.

Assessment Process Review Summary

- This Outcome utilized six different instruments, and thus, is very robust in terms of the amount of data collected. The data is consistent with previous years' data for this outcome, and the assessment process is performing adequately.

Code Assessment Process Action Title Assessment Process Action Brief Description

N	No action required.	
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2007

Previous Curriculum Action Review Summary

- No Action needed.

Curriculum Review Summary

- There are little differences among instruments, performance criteria and instrument assessors. Overall, it appears that the curriculum is performing very well.

Code Curriculum Action Title Curriculum Action Brief Description

N	No action required.	
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Previous Assessment Process Action Review Summary

- No previous actions were required from the previous review cycle.

Assessment Process Review Summary

- This Outcome utilized eight different instruments, and thus, is very robust in terms of the amount of data collected. The data is consistent with previous years' data for this outcome.

Code Assessment Process Action Title Assessment Process Action Brief Description

N	No action required.	
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2008

Previous Curriculum Action Review Summary

Watch to see if faculty change is yielding lower values by reduced writing emphasis (viz. exit Han and Stone) and/or through different faculty member's scoring variation.

Curriculum Review Summary

- It appears that the curriculum is performing adequately. Generally lower scores were reported for the design fair presentations than for the other instruments that were reported.

Code Curriculum Action Title Curriculum Action Brief Description

N	No action required	
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Previous Assessment Process Action Review Summary

- Watch to see if faculty change is yielding lower values by reduced writing emphasis (viz. exit Han and Stone) and/or through different faculty member's scoring variation. Assure that metrics are reviewed for scoring communication.

Assessment Process Review Summary

This outcome utilized six different instruments, and thus, is very robust in terms of the amount of data collected. Triangulation was possible because of the relatively large number of instruments that were used.

Code Assessment Process Action Title Assessment Process Action Brief Description

N	No action required	
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2009

Previous Curriculum Action Review Summary

- It appears that the curriculum is performing adequately. Generally lower scores were reported for the design fair presentations than for the other instruments that were reported.

Curriculum Review Summary

- Overall quality of senior design reports appear to decrease from previous year's quality. This finding bears watching into the next assessment cycle as the capstone report often serves as a bell weather for overall program communication skills.

W	Monitor Senior Design Communications	Monitor quality of communications, particularly Senior Design Report (note, in the current cycle Juniors are also participating in these reports).
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Previous Assessment Process Action Review Summary

- This outcome utilized six different instruments, and thus, is very robust in terms of the amount of data collected. Triangulation was possible because of the relatively large number of instruments that were used.

Assessment Process Review Summary

The assessment instruments used were adequate and varied. Five different assessors were used and a total of seven instruments in total, making the assessment process very robust.

N	No action required.	
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Action Review for Outcome (h) Know engineering's global societal context**2004****Previous Curriculum Action Review Summary**

Greater coordination of ABET criteria (h) and (i) within MET 321 and MET 310.

Curriculum Review Summary

Scores stayed essentially constant from 2003 to 2004, but the number and type of review was increased and included more than senior design. The students performed well.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
W	Watch coordination	Coordinate Outcomes (h) and (i) within MET 321 and MET 310.

Previous Assessment Process Action Review Summary

No Assessment Process Action was suggested.

Assessment Process Review Summary

Assessment Process seems to be working well.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

2005**Previous Curriculum Action Review Summary**

No Curriculum Action Review actions were suggested for outcome (h).

- A Curriculum Action Review watch item was given in 2004.

Curriculum Review Summary

The global and societal outcome showed a large decrease in student performance for 2005 as compared to 2004. This was accompanied by a large decrease in the total number of assessments. The decrease in the number of assessments was likely due to a shift in which portions of the curriculum were used to evaluate Outcome (h).

- The watch item from 2004 will be continued to 2005 as the curriculum shift of Outcome (h) was implemented in part due to this watch, and the courses in which implementation occurs are offered every other year.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
W	Curriculum Shift	As the curricular areas assessing global and societal context are being shifted, watching to ensure this goes smoothly is important.

Previous Assessment Process Action Review Summary

No Assessment Process Action was suggested for Outcome (h) from 2004.

- A general assessment action item concerning better metric matching in all ABET Outcomes was delineated. This action requested questions for an exit exam for the graduating seniors.

Assessment Process Review Summary

During 2005, the global and societal context requirements were a little sparse, most likely due to lag in changing class procedures to accommodate this requirement. This situation should be monitored to ensure that the requirements are fulfilled.

- Question collection was begun, but the exit exam is not expected to be fully operational until 2007.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
W	Curriculum Shift	As the curricular areas assessing global and societal context are being shifted, watching to ensure this goes smoothly is important.
A	Question Collection	Questions for a new exit examination will be sought.

2006**Previous Curriculum Action Review Summary**

No Curriculum Action Review actions were suggested for outcome (h).

- A Curriculum Action Review watch item was given in 2004 and continued to 2005.

Curriculum Review Summary

Student performance was similar to that in 2005, but is somewhat lower than desired. The number of assessments was good this year, indicating that the curriculum shift is working

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
W	Student Performance	Student performance has not been at the desired level for consecutive years, if this continues action will be required.

Previous Assessment Process Action Review Summary

From 2005, a watch and an action were seen as needed for Assessment Process Action concerning Outcome (h).

- The watch related to the shift in Outcome (h) assessments between courses.

- The action related to collecting questions for an exit examination.

Assessment Process Review Summary

The instruments used for assessment provided a large increase in the number of assessments, indicating that the watch can be lifted.

- The question collecting action is in progress as the exit examination was not ready for implementation in 2006.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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2007

Previous Curriculum Action Review Summary

No Curriculum Action Review actions were suggested for outcome (h).

- A Curriculum Action Review watch item was given in 2006 regarding student performance.

Curriculum Review Summary

During 2007, the global and societal context students assessed were not quite up to the level desired. This was true in the previous year also, indicating this area may need some curricular work.

- A watch item is felt to be necessary as new faculty have recently been hired and as these faculty begin to understand the what is required in Outcome (h) the student's understanding of global and societal context should improve.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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W	Student Performance	Student performance has not been subpar, but has been less than desired for three years.
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Previous Assessment Process Action Review Summary

No Assessment Process Action Items were given for 2007. An Assessment Process Action watch was given related to student performance.

Assessment Process Review Summary

- The student performance watch item will be carried over, as this issue has yet to be resolved fully.
- The local exam was given for the first time. The results will need to be watched to ensure that the exam adequately assesses ABET Outcome (h).

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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W	Local Exam	Correspondence of Local Exam results with other Assessment instruments.
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2008

Previous Curriculum Action Review Summary

No Curriculum Action Review actions were suggested for outcome (h).

- A Curriculum Action Review watch item was given in 2007 regarding student performance.

Curriculum Review Summary

Student performance was much improved in 2008. The number of assessments remained high.

- Despite the improvements in performance, the watch item will be continued to 2009 to ensure that 2008 was not a fluke.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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W	Student Performance	Student performance has recently improved but a watch is needed to ensure that this improvement is due to the curriculum and not a fluke performance.
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Previous Assessment Process Action Review Summary

No Curriculum Action Review actions were suggested for outcome (h).

- A Curriculum Action Review watch item was given in 2007 regarding student performance.

Assessment Process Review Summary

In general the Assessment Process appears to be working well.

- The watch action is still felt to be warranted, as one year of data is insufficient to determine whether or not the new faculty initiatives are working.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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W	Student Performance	Student performance has recently improved but a watch is needed to ensure that this improvement is due to the curriculum and not a fluke performance.
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2009

Previous Curriculum Action Review Summary

A Previous Curriculum Action Item watch was given in 2008, as performance had only recently begun increasing.

Curriculum Review Summary

As the scores have been increasing the curriculum seems to be better addressing Outcome (h).

N	No action required.
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Previous Assessment Process Action Review Summary

A Previous Assessment Process Watch Action was given in 2008 for 2009.

Assessment Process Review Summary

Student performance improved indicating that the watch does not need continuation.

- Little variation was observed in the mean assessments in both 2008 and 2009, so a watch may be needed to determine if this is a short term fluke or if the instruments used are a little too blunt.

W	Mean Variation	Watch if the variation of the means stays too small
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Action Review for Outcome (i) Engage in life-long learning

2004

Previous Curriculum Action Review Summary

- Coordination of life-long learning (i) instruments in MET 310 and MET 321..

Curriculum Review Summary

- Life-long Learning - Dr. Han has implemented a writing assignment designed to assess cognitive development level. This has been correlated to life-long learning behaviors. The assignment is designed to elicit from each student responses that target the gates needed to determine their cognitive development. Dr. Howard will repeat this in the alternate-year MET 321 course. Additionally, students will be required to write a personal/professional development plan and present it to their peers in MET 321.
- The average increased from 3.5 (2003) to 3.8 (2004). No score variation was given in 2004.

Code	Curriculum Action Title	Curriculum Action Brief Description
A	Coordination MET 310 and 321,	The importance of life-long learning will be enhanced by FC modules in MET 310 and 321 (Han and Howard).

Previous Assessment Process Action Review Summary

Coordination MET 310 with MET 321with for cognitive assessment

Assessment Process Review Summary

Dr. Han completed this during the Spring 2004 presentation of MET 310. It will be continued in MET 321 spring 2005 by Dr. Howard.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
N		

2005

Previous Curriculum Action Review Summary

Cognitive-Level Assessment is now Bi-annual. Discontinue the Met 321 cognitive writing instrument from outcome (i) assessment. The results of the cognitive-level assessment are to be completed by Dr. Stu Kellogg. Although we appreciate this service it does make our assessment dependant on personnel outside the program. We may want to consider paying Dr. Kellogg for his service or training ourselves to complete the cognitive assessment. We will continue under the current aegis; however, to minimize the burden on Dr Kellogg the cognitive assessment will be performed in Met 310 only.

Curriculum Review Summary

The outcome summaries increased and the range was about the same as the previous year.

Code	Curriculum Action Title	Curriculum Action Brief Description
A	Move assessment to Met 310	Move the assessment from Met 321 to Met 310.

Previous Assessment Process Action Review Summary

Remove assessment from Met 321.

Assessment Process Review Summary

Assessment was successfully remove from Met 321 and initiated in Met 310.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
N		

2006

Previous Curriculum Action Review Summary

No action needed. The assessment results derive from Dr. Stu Kellogg's professional assessments. We are going to continue to ask him for this service but need to recognize/reward his service to us.

Curriculum Review Summary

The outcome score continue to remain very high with a low range.

Code	Curriculum Action Title	Curriculum Action Brief Description
N		

Previous Assessment Process Action Review Summary

Recognize/reward Dr. Stu Kellogg's professional assessments service. Our program is highly dependent on him for his assessment service for outcome (i).

Assessment Process Review Summary

No additional action.

Code	Assessment Process Action Title	Assessment Process Action Brief Description
N		

2007**Previous Curriculum Action Review Summary**

No action needed.

Curriculum Review Summary

The scores remain comparatively high.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

N		
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Previous Assessment Process Action Review Summary

Seek Training on Cognitive Assessment for life-long Learning – Our program is too dependent on Dr. Kellogg's assessment service for outcome (i). We need to obtain training.

Assessment Process Review Summary

Nothing to report. In general the assessment for life-long learning is sufficient.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

N		
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2008**Previous Curriculum Action Review Summary**

No action needed.

Curriculum Review Summary

The outcome scores continue to remain high.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

N		
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Previous Assessment Process Action Review Summary

Seek Training on Cognitive Assessment for life-long Learning.

Assessment Process Review Summary

Nothing to report.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

N		
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2009**Previous Curriculum Action Review Summary**

No action needed.

Curriculum Review Summary

The assessment results for this instrument remain high.

N	No action required.	
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Previous Assessment Process Action Review Summary

No actions needed.

Assessment Process Review Summary

Nothing to report.

N	No action required.	
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Action Review for Outcome (j) Know contemporary issues**2004****Previous Curriculum Action Review Summary**

- There were no specific Curriculum Action items concerning (j) from the previous review cycle.

Curriculum Review Summary

- The mean for this outcome was virtually unchanged from 2003 to 2004.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N	No Actions.	

Previous Assessment Process Action Review Summary

- There were no specific Assessment Process Action items concerning (j) from the previous review cycle.

Assessment Process Review Summary

- There is a need to develop an Online Senior Survey as an instrument to assess outcome (j) and broaden instruments inventory beyond MET 321 and 310 if additional instrument can be identified.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
A	New metric development	Seek new instruments for the Outcome.

2005**Previous Curriculum Action Review Summary**

- No action required during the previous review cycle.

Curriculum Review Summary

- Need to augment Online Senior Survey as an instrument to assess outcome (j), and to broaden beyond 321 and 310 instruments.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
A	Instruments utilized	Need to broaden the number of instruments beyond MET 321 and MET 310 instruments.

Previous Assessment Process Action Review Summary

- Remove FC module on contemporary issues from Met 321 and find it a new home.

Assessment Process Review Summary

- The assessment process is limited by the single instrument that was available to assess this outcome. Need to find areas in the curriculum to assess this outcome.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
A	Instruments utilized	Need to identify new instruments to assess this outcome.

2006**Previous Curriculum Action Review Summary**

- The FC modules on contemporary issues remain in MET 321 but should be moved elsewhere in the curriculum.

Curriculum Review Summary

- The lack of data to assess (only one data set) clearly indicates that this outcome assessment process needs to be reviewed and modified.
- The instrument inventory needs to be reevaluated.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
A	Lack of data to assess outcome	This is a continuing action that needs careful attention to the number and quality of instruments to assess this outcome.

Previous Assessment Process Action Review Summary

- Move FC module on contemporary issues.

Assessment Process Review Summary

- The FC modules on contemporary issues remain in MET 321 but should be moved elsewhere in the curriculum. Since MET 321 is taught in alternate year sequence this provides for a lack of data, as is the case in this assessment cycle.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
A	Location and use of FC modules	FC modules and their utilization needs to be determined.

2007**Previous Curriculum Action Review Summary**

- Improve instruction on Outcome (j) is warranted.

Curriculum Review Summary

- Three instruments were available for assessment. Two different assessors were utilized and two different curricular instruments were used.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
W	Evaluate curricular instruments	* The use of the Local Exam and the Senior Survey appear to have brought stability to the instrument inventory, but this needs continued monitoring. * The metrics from this outcome (3.69 average) seem to indicate adequate student performance.

Previous Assessment Process Action Review Summary

- Action is continuing to be assessed. Use of MET 321 during this cycle should improve the robustness of the assessment.

Assessment Process Review Summary

- Triangulation of this outcome was realized. There was little variation in the data across the three instruments that were utilized. As noted above an increase in the number of instruments utilized would help improve the diversity of the data collected for this outcome.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N	No action required.	

2008

Previous Curriculum Action Review Summary

- Improved Instruction on Outcome (j) Contemporary Issues was warranted.

Curriculum Review Summary

- Two instruments were used to assess this outcome.
- A broader number of instruments would increase the robustness and depth of the assessment.
- Two different assessors (student self-assessment and a keyed assessment) were utilized.
- An average score of 4.24 is indicative that students are performing well on this Outcome.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
W	Watch use of curricular instruments.	Continue to monitor utility of the new instruments that have been developed to measure this Outcome.

Previous Assessment Process Action Review Summary

- Continue to strengthen the Contemporary Issues Module and embedding in MET 321 class in the Spring 2009.

Assessment Process Review Summary

- The instrument inventory needs to be expanded so that triangulation results. Otherwise the assessment process appears to be performing adequately.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
W	Instrument inventory watch	Continue to watch the instruments utilized and if need be expand the instrument inventory to measure this Outcome.

2009

Previous Curriculum Action Review Summary

- Improved Instruction on Outcome (j) Contemporary Issues was warranted.

Curriculum Review Summary

- It was found that the student scores from the instruments used during the assessment cycle were on average reasonably high (average 3.92).
- Overall, the student performance on this outcome appears adequate.

N	No action required.	
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Previous Assessment Process Action Review Summary

- The instrument inventory needs to be expanded so that triangulation results.

Assessment Process Review Summary

- Unlike the previous assessment period triangulation assessment occurred.

- An additional instrument to the assessment "toolbox" would help make the Assessment Process for this Outcome more robust.

W	Consider Expanding Instrument Inventory for (j)	The instrument inventory should be monitored carefully, and if possible the instrument inventory expanded.
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Action Review for Outcome (k) Use engineering techniques, skills, and tools**2004****Previous Curriculum Action Review Summary**

There was no specific Curriculum Action specified at the end of 2003 for outcome (k) during 2004.

Curriculum Review Summary

- Outcome (k) scores decreased slightly from a 2003 to 2004.
- Outcome (k) score variation among the three metrics decreased somewhat from 2003 to 2004.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

N		
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Previous Assessment Process Action Review Summary

A lab equipment quiz was recommended to improve outcome (k).

Assessment Process Review Summary

- The determination of whether the skills assessed with Outcome (k) using the existing WebCT on-line quiz and tutorial administered to juniors and seniors is still not yet determined. Dr. Stone is heading up this work.
- There is concern that the MET 440 instrument is inadequate.
- There is concern that assessment of sophomores is inadvisable.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
W	Higher level of Skills in MET 440	Choose a different 440 lab assignment for future assessment.
W	Sampling sophomores in MET 220	Met 220 instrument appears adequate, the only concern is that it involves sampling of Sophomores who might not have fully developed their engineering skills.

W	Higher level of Skills in MET 440	Choose a different 440 lab assignment for future assessment.
W	Sampling sophomores in MET 220	Met 220 instrument appears adequate, the only concern is that it involves sampling of Sophomores who might not have fully developed their engineering skills.

2005**Previous Curriculum Action Review Summary**

The Charpy impact instrument should not appear in outcome (k). The use of computer tools is better than the student's use of actual laboratory hardware; however, the overall trend for outcome (k) is upward. Faculty will endeavor to improve laboratory instruction. Continue doing what we are doing.

Curriculum Review Summary

There was a considerable increase in the outcome scores from 2004 to 2005 and the overall range decreased as well.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
A	Charpy tests	Remove the Charpy impact instrument from outcome (k)

A	Charpy tests	Remove the Charpy impact instrument from outcome (k)
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Previous Assessment Process Action Review Summary

No actions were needed.

Assessment Process Review Summary

No actions were needed.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

N		
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2006**Previous Curriculum Action Review Summary**

No action needed

Curriculum Review Summary

The outcome review score remained almost unchanged.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
N		

N		
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Previous Assessment Process Action Review Summary

No actions are needed.

Assessment Process Review Summary

No actions were needed.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
N		

N		
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2007**Previous Curriculum Action Review Summary**

No action needed.

Curriculum Review Summary

The outcome review scores increased slightly and the range remained about the same. It is recommended that methods of instruction and/or student design projects be studied to determine the increase in scores.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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N		
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Previous Assessment Process Action Review Summary

No actions needed.

Assessment Process Review Summary

No actions.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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N		
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2008

Previous Curriculum Action Review Summary

No action needed.

Curriculum Review Summary

The outcome review scores remained unchanged and the range values were about the same as the previous year.

<i>Code</i>	<i>Curriculum Action Title</i>	<i>Curriculum Action Brief Description</i>
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N		
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Previous Assessment Process Action Review Summary

No action was needed.

Assessment Process Review Summary

No action needed.

<i>Code</i>	<i>Assessment Process Action Title</i>	<i>Assessment Process Action Brief Description</i>
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N		
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2009

Previous Curriculum Action Review Summary

No action needed.

Curriculum Review Summary

The assessment results for this instrument increased slightly compared to 2008.

N	No action required.	
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Previous Assessment Process Action Review Summary

No action was needed.

Assessment Process Review Summary

Need to find another assessment instrument for Math-373 since a faculty member from the MET department is not teaching it.

Assessment information from other MET courses or labs needs to be added to this instrument.

A	Assessment for Math-373	Find other assessment methods to replace Math-373.
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