Background

The Assessment Council is charged with oversight and integration of assessment activities at Michigan Tech, including assessment of University Student Learning Goals (USLGs), degree program learning goals and course goals, as well as learning goals for student affairs. Since many Michigan Tech programs are professionally accredited (ABET, AACSB, SAF, ACS) the Council also works to balance the requirements of professional accreditation with accreditation by the Higher Learning Commission (HLC).

In 2013-14, the Assessment Council continued to work on developing processes and an infrastructure for assessment of learning goals. This report discusses key issues reviewed by the Council and concludes with recommendations.

Assessment Infrastructure

University Assessment Structure. John Jaszczak was named Associate Dean for College of Sciences and Arts with responsibility for coordinating assessment in the College; he joined the Assessment Council. Jean DeClerck was hired by the Jackson Center for Teaching and Learning as an instructional designer and assessment specialist; she will replace the CTL Director on Assessment Council and report to both the CTL Director and the Associate Provost.
Goal Committees for Goal 3 *Global Literacy*, Goal 4 *Critical and Creative Thinking*, Goal 5 *Communication*, Goal 6 *Information Literacy*, and Goal 8 *Values and Civic Engagement* were fully formed as interdisciplinary committees with at least one University Senate representative. For membership, see [www.mtu.edu/assessment/program/university-learning-goals/](http://www.mtu.edu/assessment/program/university-learning-goals/). These committees were charged with reviewing the existing Michigan Tech rubrics (based on AAC&U VALUE rubrics) and recommending any changes, planning and implementing training opportunities to improving student learning for their goal, and participating in assessment of student learning in the General Education program.

**Assessment Training.** Council members attended multiple trainings in 2013-4 to stay current on assessment practices and learn more about how assessment is conducted at other universities. Information from these meetings have improved assessment processes and Council recommendations.

- Higher Learning Commission Assessment Workshop, June 2013 – Walck, DeClerck, (also Kampe from General Education Council)
- IUPUI Assessment Conference, October 2013 – Jaszczak, DeClerck
- 2014 ABET Symposium, April 2014 - DeClerck
- AAC&U General Education & Assessment Conference, March 2014 – Walck, DeClerck, Storer
- 2014 ABET Symposium, April 2014 - DeClerck

**Assessment Website.** The Michigan Tech assessment website was redesigned and relocated to [www.mtu.edu/assessment/](http://www.mtu.edu/assessment/) in order to make more information about assessment accessible to all university members. Information had been previously been housed in a Canvas course, which continues to be maintained for Assessment Council.

**Software.** In 2012-13, the Council recommended that Canvas, Michigan Tech’s learning management system, be used to implement assessment and organize assessment data. Unfortunately, Canvas does not have advanced tools to accomplish this. As the volume of assessment artifacts increases, a software program to manage it has become critical. Three programs are under review by a small task force that includes IT – STEPS, Tk20 and Live Text—and a recommendation will be made in fall 2014.

**Assessment Processes**

**Annual Assessment Reports.** The Assessment Council reviewed all degree program annual assessment reports; only one department did not provide a report. Every department was provided with feedback and given an opportunity to improve their report prior to posting reports on a password-protected website at [www.mtu.edu/assessment/program/reports/degree-programs/](http://www.mtu.edu/assessment/program/reports/degree-programs/). In a letter to department chairs, the Council identified a few areas for improvement:
• Results should be interpreted, not just presented, and lead to action items for improvement if targets are not met.
• Targets need to be absolute targets (e.g., 85% of students will achieve 80% on the ETS exam), not just targets for improvement (target = 5% improvement).
• When sampling is used, indicate the sample size clearly.
• Be clearer about how faculty are involved in the assessment process – faculty involvement in assessment is critical.
• With respect to using rubrics, calculate scores for each criterion individually so that you can address student achievement in each criterion– don’t average the rubric’s criterion scores together.

Based on the review process and feedback from programs, the Council improved the reporting form to allow more information to be included easily and made changes to the evaluation rubric. In addition, for ABET-accredited degrees, the Provost convened a task force chaired by Jean Kampe to align ABET assessment with university-level assessment processes, in order to minimize duplication and strengthen the assessment for both ABET and HLC.

Assessing University Student Learning Goals. As part of the annual assessment process, in 2013-4 all degree programs were engaged in assessing Goal 5 Communication. Because of concern that insufficient progress had been made on developing rubrics for Goal 3 Global Literacy and Human Culture, Goal 6 Information Literacy was designated as the goal for campus-wide assessment in 2014-5. The Goal 6 Information Literacy Committee was formed, and the Van Pelt and Opie Library took the lead on this goal. In 2013-4 the Library held multiple workshops on information literacy for faculty and the Goal Committee held a luncheon for faculty in April 2014 to introduce the Goal campus-wide.

Two substantive changes were proposed by Goal Committees and approved: Goal 3 Global Literacy and Human Culture was renamed Global Literacy and Goal 8 Values and Civic Engagement was renamed Social Responsibility and Ethical Reasoning. Revised goal statements and revised rubrics have been posted on the university assessment webpage at www.mtu.edu/assessment/program/university-learning-goals/. Revised rubrics were used for assessment of General Education core courses in May 2014. Assessor groups will review results and provide feedback on the rubrics and assessment processes to the Goal Committees in May 2014; Goal Committees will provide results and feedback to faculty teaching courses tagged with the rubrics as well as Assessment and General Education Councils in Fall 2015 as part of continuous improvement.

Presentations and Workshops for Assessment. An important assessment process is enabling continual improvement. To that end, the Assessment and General Education Councils have sponsored multiple opportunities for faculty to learn more about assessment and provide feedback on assessment processes:

4. Coffee Chat on UN1015 Composition Feb. 20, 2014 – laying the foundation for Goal 5 Communication and Goal 6 Information Literacy
5. Information Literacy Workshop/Luncheon, April 8, 2014.
6. Assessment Training for Faculty teaching General Education HASS Courses. May 2014 and August 2014.

The Senate Forums raised a variety of issues about methodologies for assessment of student learning, including random sampling of student work and the possibility of using signature assignments, e-portfolios and capstone courses. Assessment Council will charge a small task force with looking at statistical implications of sampling in 2014-5. Signature assignments are planned for UN1015 Composition.

**LEAP Initiative.** The Council emphasizes direct, embedded assessment of student work and uses LEAP’s VALUE rubrics ([http://www.aacu.org/value/rubrics](http://www.aacu.org/value/rubrics)), developed by the American Association of Colleges and Universities, for campus-wide assessment. In July 2013, the Associate Provost attended the LEAP Summit in Colorado. One of the outcomes of the summit was a Michigan LEAP initiative led by a Michigan Focused on Essential Learning Outcomes (MIFELO) steering committee consisting of Michigan public university associate provosts (see attachment). Several Michigan public universities, including Michigan Tech, have endorsed this initiative.

**Assessment Results**

**Annual Assessment Reports.** Every degree program selected two program goals to assess. Results were generally positive, with programs achieving targets they set for achievement. Feedback to departments included suggestions regarding appropriateness of targets. Several exemplary reports from Mathematical Sciences, Biological Sciences, and Mechanical-Engineering-Engineering Mechanics, were highlighted.

**General Education Assessment.** See *General Education Council Annual Report, 2013-4* (online at [www.mtu.edu/provost/academic-policies/general-education/administration/](http://www.mtu.edu/provost/academic-policies/general-education/administration/)).

**Michigan Tech Student Satisfaction Survey.** The survey was administered, but results have not yet been reported.

**Gap Analysis.** The Council reviewed publications from the National Institute for Learning Outcomes Assessment (NILOA) on best practice and current issues in assessment in March. The Council then performed a gap analysis using HLC expectations for assessment in the new Criteria for Accreditation.

<table>
<thead>
<tr>
<th>HLC Criterion for Accreditation 4B:</th>
<th>Rate how well Michigan Tech meets this now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates a commitment to educational achievement and improvement through ongoing assessment of student learning. The institution:</td>
<td></td>
</tr>
<tr>
<td>1 has clearly stated goals for student learning and effective processes for assessment of student learning and achievement of goals</td>
<td>Rate 1 low to 5 high</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
2. assesses achievement of outcomes it claims for its curricular and co-curricular programs
3. uses the information gained from assessment to improve student learning
4a. The processes and methodologies to assess student learning reflect good practice
4b. The processes and methodologies include the substantial participation of faculty and other instructional staff members

Assessment Council Recommendations to Improve Assessment Infrastructure and Processes

Results of the Gap Analysis led the Council to develop a set of priorities and recommendations for improvement. The Council met with Provost Seel in April 2014 to identify the following priorities, make recommendations for next year, and establish a timeline for action.

Priorities for 2014-5

1. Rebrand assessment at Michigan Tech to emphasize learning.
2. Implement strategic plan to engage faculty.
3. Promote the scholarship of teaching and learning.
4. Understand affordances of measurement of data.

Recommendations:

1. Rebrand assessment at Michigan Tech
   a. Change the conversation from assessment to student learning.
      − Clearly communicate what "improving student learning" means, not as a criticism of where you are but an exploration of where you may go
      − Reinforce that assessment provides an opportunity to look at things systematically and systemically
      − Promote assessment as a scholarly opportunity focused on teaching and learning and not as just an administrative burden
   b. Develop a visual symbol for assessment
   c. Develop brochures for faculty and students

2. Implement strategic plan to engage faculty
   a. Increase participation through conversation - identify means to reduce skepticism (showing value, listening to concerns, etc.)
      − Identify faculty champions who understand the assessment process and assist faculty across campus; could be “faculty fellows”
   b. Foster support from administrators and department chairs
      − Convey the accountability vs. learning improvement model widely, help central administration understand assessment
− Department chairs report on successes in Academic Forum – the best get a monetary reward

**c. Promote education research internally with faculty reward system**
− Reward tenure-track faculty for engagement in assessment, reward tenured faculty for leadership of assessment activities, hold competition for most improved or engaged, reward with money or release time, Provost rewards
− Provide support for assessment (summer funding, CTL)

**d. Provide venues for listening to questions and concerns**
− Identify what faculty complain about re their students – how can that be harnessed to assessment process
− Respect established approaches of departments, colleges and programs and recognize constraints

3. **Promote the scholarship of teaching and learning**
   a. Guide faculty how to “do” education research for data-driven improvement
      − Support in the design of experiments (sampling, measurement)
      − Provide assistance and guidance for collecting data for assessment and preparing for publication
      − Form faculty groups to discuss signature papers and provide peer-review support for faculty scholarship and writing (via CTL and multiliteracies center)
   b. Showcase best research on campus; hold a teaching and learning improvement conference

4. **Understand affordances of measurement data**
   a. Bring people together to understand the statistics (chemistry, astronomy, math/statistics, social sciences, cognitive science, technical communications) and validity of Gen Ed data.

**Timetable of Actions to Implement Assessment Priorities in 2014-5**

**Summer**

**Logo** to brand Assessment of Student Learning brand – AIM (Analyze, Improve, Measure)

Develop **brochure** explaining importance of USLGs to students

Develop **brochure** explaining USLGs and Assessment of Student Learning to faculty. Key things to include:

- Grading vs. assessment
- Assessment vs. educational research
- Role of assessment in curriculum development
Identify preferred **assessment software** (STEPS vs Tk20)

**August**  
New Faculty **Orientation** - include assessment overview and brochure for faculty  
New Student **Orientation** – student brochure with USLGs  
Advisor Workshop – role of academic advisors in advocating USLGs  

**Departmental Retreats:** Provost/deans/chairs advocate retreats to discuss, consider inviting CTL assessment specialist;  
- Discuss annual results of assessment of communication and identify actions for improvement  
- plan for assessment of information literacy  
- identify faculty champions  
- clarify who is responsible for managing assessment of learning in the department (curriculum committee? Assessment committee?)

**September**  
President and Provost hold **convocation/university-wide faculty meeting**  
- set priorities for the year, including improving student learning  
- introduce Goal Committee members  
- awards  
  - teaching, research, service  
  - other recognitions- Assessment driven improvements in curricula/programs  
  - program development

Convene Assessment Council – add Senate Instructional Policy Chair

Convene Goal 2 Committee

Provost addresses **reward structure** for teaching and learning with deans/chairs, including modification of F1 to document and allocate credit in P&T process for  
- engaging in improving student learning (assessment activities in department or university, documented course improvement effort and results, etc.)  
- engaging in research on teaching and learning – conference presentations, publications, etc.

CTL and Cognitive & Learning Sciences - establish CTL Fellows for Improving Student Learning with release time, stipends – **faculty champions**
Convene **Measurement Group** – sampling, etc. to inspire confidence in process and results (or make recommendations in light of constraints)

**October**

Coffee Chat on Goal 6 Information Literacy

Communication Goal Results 2013/4

- Complete review of annual assessment reports, include Communication Goal Committee in this process

Plan and conduct Goal 2 workshop for Goal 2 Gen Ed courses on Math and Science list

**November**

- Conduct university-wide meeting/lunch and learn for faculty (curriculum committee chair?) and department chairs

**Showcase successes** of assessment practice

a. Most impact on student learning

b. Most improved

Identify where we are now and actions to close the loop

Midterm review reminder from Provost on grades should emphasize improving student learning

**January**

University-wide **feedback session** – listening opportunity

Work with departments to collect student work for Goal 2 Gen Ed STEM assessment.

**March/April**

Plan for **Upper Midwest Assessment Conference** Fall 2015

- Keynote speaker: Gloria Rodgers
- Showcase best practice, research
Attachments

Michigan LEAP Initiative

Assessment Annual Reporting Format

Rubric for Evaluating Michigan Tech Annual Assessment Report for Degree Programs (revised 2014)

Timetable for Implementing Recommendations
The members of the Michigan LEAP Initiative acknowledge that the goals of general education are fundamental to all baccalaureate degrees granted by our institutions. We will work together to continually improve our general education programs and make them meaningful for all students through collaboration and effective assessment. We also respect the individual nature of our institutions and recognize that the goals we aspire to can be achieved in many different ways.

The administrative body for this initiative will be the Michigan Focused on Essential Learning Outcomes (MIFELO) steering committee. This group will be composed of administrators responsible for general education and/or assessment at the member institutions and will be responsible for engaging faculty, parents, legislators and business leaders in dialogues on critical issues facing students at our institutions.

This initiative has several advantages for higher education across the State of Michigan. These include:

- allowing a mechanism to increase the impact of our limited resources through shared efforts. The MIFELO steering committee will work collaboratively to provide programs that are now largely provided by individual institutions or not at all.
- developing a stronger sense of community among faculty at member institutions to leverage their expertise in addressing issues that affect every institution.
- instilling a deeper environment of collaboration that will serve as a united front and work with the Presidents Council in communicating, with a common language, the critical role higher education plays in the economic development of the State of Michigan to external constituents.
- providing a framework for advancing quality learning initiatives and creating new and innovative solutions to challenging problems across the state. Sharing ideas/best practices, as well as experiences with respect to common goals such as using the AAC&U essential learning outcomes and VALUE rubrics, effective assessment and transfer of credit from community colleges, will help students at all institutions.
- developing a partnership with the Association of American Colleges and Universities (AAC&U) that will allow Michigan universities to work with institutions around the country on creative solutions to issues in higher education. Examples of past and current efforts by LEAP states includes the Compass Project carried out by institutions in Wisconsin, California and Oregon and the Interstate Passport Initiative involving institutions from many states.
The MIFELO steering committee recommends the following projects as a starting point for this LEAP State Initiative. This does not represent an exhaustive list of projects, but simply shows a sample of what can be started in the near future.

- Continue statewide discussions about best practices at member institutions with regards to assessment of general education (closing the loop), the use of high impact practices and AAC&U VALUE rubrics, and attempts at integrative learning.
- Develop a communication plan to explain the value of general education learning outcomes to students, parents, legislators and employers.
- Develop effective methods to incorporate the basic skills of general education across the curriculum. This will include ways in which to assess the impact on student learning of any given initiative so that data driven decisions can be made.
- Discuss ways in which the member institutions may help make the high school to college transition easier for students.
ASSESSMENT ANNUAL REPORTS for University Degree Programs
2014

Every year, departments should engage in assessment of student learning in their degree programs and complete an annual report for the Assessment Council. The Council will provide feedback on annual reports and post them to the ISO-protected assessment website at http://www.mtu.edu/assessment/program/reports/. After receiving the feedback, departments can make changes to their report before it is posted. Assessment Annual Reports are due October 1.

Assessment Annual Report Format.

For each undergraduate degree program, departments report annually on assessment of at least two learning goals – (1) a program goal of choice, and (2) the University Student Learning Goal designated for that year. The report includes five elements:

- Learning Goal
- Assessment Activities
- Results
- Action Planned for Improvement
- Results to Close the Loop: Results after taking action for improvement (Note: this will be completed the year following the initial assessment)

A template is attached to report these elements succinctly in table format (Format A) or long format (Format B). Departments using the table are encouraged to provide additional information or discussion of activities, results or actions as needed. For an example, see the report by the Department of Mathematics below.

1. LEARNING GOALS.
   - Label the first column with your program name.
   - Identify the first goal (typically a program goal that is USLG#1 Disciplinary).
   - Identify which University Student Learning Goal is aligned with this goal:
     - Goal 1 Disciplinary Knowledge
     - Goal 2 Knowledge of the Physical and Natural World
     - Goal 3 Global Literacy
     - Goal 4 Critical and Creative Thinking
Goal 5 Communication
Goal 6 Information Literacy
Goal 7 Technology
Goal 8 Social Responsibility and Ethical Reasoning

- Next, identify the USLG which is scheduled for assessment university-wide, according to the following schedule:
  - 2013-14 Communication
  - 2014-15 Information Literacy
  - 2015-16 Global Literacy
  - 2016-17 Critical and Creative Thinking
  - 2017-18 Social Responsibility and Ethical Reasoning

- Learning goals will be evaluated on how explicit and measurable or observable they are.

2. ASSESSMENT ACTIVITIES.
   - Identify and describe all the ways these goals will be assessed (please identify at least one direct measure annually)
     - Direct/embedded assessment in existing course – e.g., course exam in XX2500, written assignment in YY4200
     - Direct assessment, not in course, e.g., professional competency examination
     - Indirect assessment, e.g., exit interview, alumni survey
   - Identify the target level of performance outcome – e.g., all students will achieve a level 2 proficiency, or 80% of students will achieve 70% on exam x.
   - State when the assessment was conducted.
   - If you use a rubric to assess student outcomes, please attach the rubric.
   - Please explain how faculty are involved in the assessment process.

- Assessment activities will be evaluated on goal alignment, appropriateness of target, whether measures are appropriate, direct and feasible, and faculty involvement.

3. RESULTS. Report results of each assessment activity: Actual performance vs. target level of performance outcome.
Results will be evaluated on whether they are clearly summarized, discuss learning goal attainment, and where applicable, use appropriate rubrics.

4. **ACTION PLANNED FOR IMPROVEMENT.**
   - Identify actions to take the following year to improve performance outcomes and achieve the target.
   - Discuss how faculty are involved in planning for improvement and implementing proposed change.

Actions for improvement will be evaluated on changes, clarity of plans and faculty involvement.

5. **RESULTS to Close the Loop.**
   - Report results of assessment activity.
   - Evaluate whether the actions taken were successful and should be continued, or not successful and new actions taken. This closes the loop.

Results will be evaluated on whether they are clearly summarized, discuss learning goal attainment, and where applicable, use appropriate rubrics.
<table>
<thead>
<tr>
<th>Insert your DEGREE PROGRAM name here</th>
<th>LEARNING GOALS</th>
<th>ASSESSMENT ACTIVITIES</th>
<th>RESULTS</th>
<th>ACTION PLANNED FOR IMPROVEMENT.</th>
<th>RESULTS to Close the Loop.</th>
</tr>
</thead>
</table>
| 1  Goal of your choice here | University Goal: ___ | Type (check all that apply):  
__ Course Direct  
__ Other Direct  
__ Indirect  
Brief description:  
When?  
Target: | Date: | Brief description:  
When? | Date: |
| 2 Communication (Goal 5) | Type:  
__ Course Direct  
__ Other Direct  
__ Indirect  
Brief description:  
Target:  
University Goal: | Date: | Date: |
Goal 3: Majors demonstrate the ability to solve and verify mathematical work by using different methods to approach the same problem.

<table>
<thead>
<tr>
<th>Type: Course Direct</th>
<th>ASSESSMENT ACTIVITY</th>
<th>WHEN</th>
<th>RESULTS 1</th>
<th>ACTION PLANNED</th>
<th>RESULTS 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief description:</td>
<td>Spring 2013</td>
<td></td>
<td></td>
<td>Fall 2013:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Early September 2013</td>
<td>Fall 2013:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>82% of students were able to approximate a solution to a differential equation both numerically and graphically. However, only 64% understood what it meant to be a solution. There was not enough information to discern whether students made any connections between these solutions.</td>
<td>Date:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target: 70% of students to be at the Satisfactory or Exceptional level</td>
<td>Late Sept. 2013</td>
<td></td>
<td></td>
<td>Spring 2014:</td>
<td></td>
</tr>
<tr>
<td>University Goal: Disciplinary Knowledge</td>
<td></td>
<td></td>
<td></td>
<td>We recommend another assessment of this goal in Spring 2014. We also suggest developing other exam questions to use in assessing this goal.</td>
<td></td>
</tr>
</tbody>
</table>

Results from the evaluation were shared with currently MA2160 teachers, and they were encouraged to develop ways to address this goal in their courses this semester.
Goal 2: Majors demonstrate the ability to solve problems and write mathematics in Analysis.

**Type:** Course Direct

**Brief description:** Students in MA3450 were required to take a series of 5 “mastery tests” which assessed their ability to organize and present a set of theorems and their proofs. A sample of student work on the mastery test was checked to determine if the standards for passing were reasonable.

**Target:** 75% of students successfully complete at least 4 mastery tests.

**University Goal:**

Disciplinary Knowledge

<table>
<thead>
<tr>
<th>Spring 2012</th>
<th>Spring 2013 and Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
<tr>
<td>September 2013</td>
<td>This assessment should be continued.</td>
</tr>
<tr>
<td>100% of students successfully completed at least 4 mastery tests.</td>
<td>Assess similar skills in MA3210 and MA3310.</td>
</tr>
<tr>
<td>The standards for passing/failure of tests was verified.</td>
<td>(See discussion below for details.)</td>
</tr>
</tbody>
</table>
**Goal 3:** Majors demonstrate the ability to solve and verify mathematical work by using different methods to approach the same problem.

**The Problem:** Students were given three questions related to a particular differential equation. First they graphed approximate solutions on a slope field. The second question asked them to verify that a certain formula gave a solution to the differential equation. The third question students compute an approximate solution using Euler’s method.

**Discussion:** As implemented, it was not possible to assess whether students made any connection between the three questions being assessed. It is entirely possible that the students might see these as three different processes, without making a connection between them. Future questions will be more directive for assessing this goal. These questions did, however, give us some useful (if disturbing) information: a significant fraction of students seem to be able to compute an approximate solution for a differential equation without even knowing what “a solution” means.

**Rubric:** The following rubric will be used to assess similar problems on future exams.

<table>
<thead>
<tr>
<th>Minimal</th>
<th>Developing</th>
<th>Satisfactory</th>
<th>Exceptional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very problematic. No evidence of skills or knowledge.</td>
<td>Something is correct, with reasoning or supportive work.</td>
<td>All three parts of the problem had consistent answers.</td>
<td>All three parts were correct, consistent, and well justified.</td>
</tr>
<tr>
<td>No clear evidence of consistency between all three parts of the problem.</td>
<td>There may be some sort of error, or perhaps some weak explanation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Goal 2:** Majors demonstrate the ability to solve problems and write mathematics in Algebra, Analysis, Combinatorics, and Statistics.

**The Problem:**

**Discussion:** The instructor gathered mastery test samples which were chosen to illustrate (in the instructor's assessment) good performance, marginal performance, and unsatisfactory performance. The assessment of the Undergraduate Committee of the sampled papers was compared to the instructor's assessment.

The ability to write proofs should also be assessed in MA3310 (Introduction to Abstract Algebra) and MA3210 (Introduction to Combinatorics), as follows: A consistent list of theorems (approximately 3-5) should be chosen for each course and a quiz administered late in the semester. Students know they have to be prepared to prove those particular theorems. The quiz will count as part of the course grade. The instructor will grade the quiz as usual and also assess each paper on the four-point scale; s/he will select sample of papers representing good (solid 3 or 4), marginal (2+/3-), and unsatisfactory (2 or 1) work. These papers will be assessed independently by the Undergraduate Committee to verify that the instructor's assessment is at the appropriate level. The Undergraduate Committee will begin sample tests this year and begin collecting a set of suitable theorems for the quiz.
**Rubric:** The following rubric was developed to assess these proofs.

<table>
<thead>
<tr>
<th>Minimal</th>
<th>Developing</th>
<th>Satisfactory</th>
<th>Exceptional</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the criteria listed under &quot;Satisfactory&quot; is met.</td>
<td>Contains one or more of the elements listed for &quot;Satisfactory,&quot; but not all.</td>
<td>Structure parallel to definition/theorem (or signaled by contradiction), consistent notation, includes main theorem citation(s) and inferences, major points addressed.</td>
<td>Proof is clear, complete, and includes all citations and inferences. Notation is explicitly defined and consistent.</td>
</tr>
<tr>
<td>May contain minor (fixable) errors and omissions.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FORMAT B.

Complete for two learning goals – Goal of choice and designated University Goal (see schedule).

DEGREE PROGRAM: ___________________________    DEPARTMENT: ___________________________

LEARNING GOAL: __________________________

University Goal: ______________

Assessment Activities:

Type of Activity (check all that apply):

__ Course Direct
__ Other Direct
__ Indirect

Brief description:

When?

Target:

Results:

Action Planned for Improvement:

Description:

When?

Results to Close the Loop:
Rubric for Michigan Tech Annual Assessment Report for Degree Programs  (revised 2014)

Degree Program: ________________________     Goal ________________     Department: __________________________

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
<th>Explicit</th>
<th>Measurable/Observable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning Goal</strong></td>
<td>4</td>
<td>Explicitly defines what student will know or do</td>
<td>Describes an observable and measurable behavior or product</td>
</tr>
<tr>
<td>A learning goal specifies what students will know or be able to do when they graduate from the academic degree program.</td>
<td>3</td>
<td>Does not explicitly define what students will know or do; states a broad outcome that needs to be further specified</td>
<td>Describes a potentially observable and measurable behavior or product</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Unclear or incorporates multiple outcomes</td>
<td>Describes something for which it is difficult to collect evidence</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>No learning goals, or focusses on program mission or processes</td>
<td>Does not identify something observable or measurable</td>
</tr>
</tbody>
</table>

Criteria scores | x | x

Comments:
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
<th>Aligned</th>
<th>Target</th>
<th>Appropriate, Direct, Feasible</th>
<th>Faculty Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment Activities /Method</td>
<td>4</td>
<td>Align with goals and described in sufficient detail</td>
<td>Sets appropriate target for success in meeting the goal</td>
<td>Appropriate direct measures, highly feasible</td>
<td>Faculty and staff involvement is described and exemplary</td>
</tr>
<tr>
<td>Activities and means by which evidence will be collected to determine whether students have met the goal/outcome. Indirect methods are acceptable, supplemental measures to provide context.</td>
<td>3</td>
<td>Align with goals but not described sufficiently</td>
<td>Sets a target for meeting the goal that needs to be defined more clearly</td>
<td>Appropriate and direct measures, feasible</td>
<td>Faculty and staff involvement is described and sufficient</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Unclear if methods align with goals</td>
<td>Identifies only a rationale for success</td>
<td>May not be appropriate measures</td>
<td>Faculty and staff involvement is described but insufficient</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Do not align with goals</td>
<td>Identifies no target or rationale for success</td>
<td>Activities or methods are absent or vague</td>
<td>Faculty and staff involvement is not described</td>
</tr>
</tbody>
</table>

| Criteria scores | x | x | x | x | x |

Comments:
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
<th>Clear Summary</th>
<th>Attainment of Learning Goal</th>
<th>Use of Rubrics (where applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment Results</td>
<td>4</td>
<td>Summarized and clearly reported</td>
<td>Clear discussion about degree of attainment of learning goal</td>
<td>Appropriate and adequate rubric used, attached</td>
</tr>
<tr>
<td>Presentation of results are clearly summarized and reported in ways that align with learning goals</td>
<td>3</td>
<td>Summarized but not clear or concise</td>
<td>General but vague discussion of degree of attainment of learning goal</td>
<td>Rubric was used, attached, but needs some improvement</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Incomplete or inaccurate discussion of results</td>
<td>Unclear discussion about degree of attainment of learning goal</td>
<td>Rubric was used but not attached</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Absent or vague findings.</td>
<td>No discussion of degree of attainment of learning goal</td>
<td>No rubric was used, but one was needed</td>
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</tbody>
</table>

Criteria scores: x x x

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<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
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<th>Plan for improvement and assessment</th>
<th>Faculty Involvement</th>
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</thead>
<tbody>
<tr>
<td>Action Planned in Response to Results</td>
<td>4</td>
<td>Specific changes are described that are clearly linked to findings OR Very clear that no changes are warranted.</td>
<td>Clear plan for improvement and assessment OR Very clear that no improvement is warranted</td>
<td>Evidence of significant faculty involvement in developing and implementing action plan</td>
</tr>
<tr>
<td>Results are used to drive change and improvement in instruction, curriculum, or strategic planning.</td>
<td>3</td>
<td>Changes are noted but there is insufficient evidence that changes are linked to findings.</td>
<td>Action plan is articulated but may not be sufficient for improvement.</td>
<td>Faculty responsible for change and improvement are clearly identified.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Changes are vague or unclear and not linked to findings.</td>
<td>Identifies areas for improvement but no action plan for improvement and assessment</td>
<td>Some faculty responsible for change and improvement are identified.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Changes appear warranted but are not identified.</td>
<td>No plan for future assessment</td>
<td>No faculty responsible for change and improvement are identified.</td>
</tr>
<tr>
<td>Criteria scores</td>
<td></td>
<td>x</td>
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| Comments:       |
|-----------------|---|---|---|
Timetable of Actions to Implement Assessment Priorities in 2014-5

**Summer**

**Logo** to brand Assessment of Student Learning brand – AIM (Analyze, Improve, Measure)

Develop **brochure** explaining importance of USLGs to students

Develop **brochure** explaining USLGs and Assessment of Student Learning to faculty. Key things to include:

- Grading vs. assessment
- Assessment vs. educational research
- Role of assessment in curriculum development

Identify preferred **assessment software** (STEPS vs Tk20)

**August**

New Faculty **Orientation** - include assessment overview and brochure for faculty

New Student **Orientation** – student brochure with USLGs

Advisor Workshop – role of academic advisors in advocating USLGs

**Departmental Retreats:** Provost/deans/chairs advocate retreats to discuss, consider inviting CTL assessment specialist;

- Discuss annual results of assessment of communication and identify actions for improvement
- plan for assessment of information literacy
- identify faculty champions
- clarify who is responsible for managing assessment of learning in the department (curriculum committee? Assessment committee?)

**September**

President and Provost hold **convocation/university-wide faculty meeting**

- set priorities for the year, including improving student learning
- introduce Goal Committee members
- **awards**
  - teaching, research, service
  - other recognitions- Assessment driven improvements in curricula/programs
  - program development

Convene Assessment Council – add Senate Instructional Policy Chair
Convene Goal 2 Committee

Provost addresses reward structure for teaching and learning with deans/chairs, including modification of F1 to document and allocate credit in P&T process for

- engaging in improving student learning (assessment activities in department or university, documented course improvement effort and results, etc.)

- engaging in research on teaching and learning – conference presentations, publications, etc.

CTL and Cognitive & Learning Sciences - establish CTL Fellows for Improving Student Learning with release time, stipends – faculty champions

Convene Measurement Group – sampling, etc. to inspire confidence in process and results (or make recommendations in light of constraints)

October

Coffee Chat on Goal 6 Information Literacy

Communication Goal Results 2013/4

- Complete review of annual assessment reports, include Communication Goal Committee in this process

Plan and conduct Goal 2 workshop for Goal 2 Gen Ed courses on Math and Science list

November

- Conduct university-wide meeting/lunch and learn for faculty (curriculum committee chair?) and department chairs

Showcase successes of assessment practice

c. Most impact on student learning
d. Most improved
Identify where we are now and actions to close the loop

Midterm review reminder from Provost on grades should emphasize improving student learning

January

University-wide feedback session – listening opportunity

Work with departments to collect student work for Goal 2 Gen Ed STEM assessment.
March/April  Plan for **Upper Midwest Assessment Conference** Fall 2015

- Keynote speaker: Gloria Rodgers
- Showcase best practice, research