I. Introduction

Student outcome assessment is part of our commitment to continuous improvement of our graduate programs at Michigan Tech. Programs set Graduate Learning Objectives (GLOs) for their graduate degree programs. Programs annually assess Graduate Student Learning Outcomes against these objectives. This template document details the content and suggested structure of a Program's Graduate Assessment Plan.

Programs submit an annual 2-page Annual Assessment Report to the Graduate School (separate template) indicating graduate assessment results and proposed actions for improvement.

This document describes the Graduate Student Outcomes Assessment Program for the (name graduate program(s); indicate masters(s), PhD(s), or other). For masters programs indicate which pathways to masters are included: thesis, report, professional (coursework-only).
II. PhD Program(s)
   A. PhD Graduate Learning Objectives (GLOs)

   Articulate here the learning objectives that your program has adopted for its PhD candidates. The number of objectives is not limited, but programs are encouraged to have no more than five objectives. These objectives must differentiate the expectations for PhD candidates compared to non-PhD (e.g. masters) candidates.

   The PhD Graduate Learning Objectives of our program are:
   1. Demonstrate mastery of the subject matter
   2. Demonstrate advanced research skills (for example, design and execute a research project)
      a) Master application of existing research methodologies and techniques
      b) Critically analyze and evaluate one’s own findings and the findings of others
   3. Make an original and substantial contribution to the discipline
   4. Demonstrate professional skills
      a) Effective written communication skills
      b) Effective oral communication skills
   5. Practice responsible conduct of research (field-appropriate)
**B. Assessment Points for Measuring PhD Graduate Student Learning Outcomes (GSLO)**

*Articulate here the assessment points your program has adopted to measure Graduate Student Learning Outcomes for its PhD candidates. If desired, the programs may adopt, without change, the example list of assessment points listed in black below. Those in grey are extra suggested tools.*

<table>
<thead>
<tr>
<th>Assessment Points for Graduate Student Learning Outcomes (GSLO) (a measure of student attainment of Graduate Learning Objectives)</th>
<th>PhD Graduate Learning Objectives (GLO) addressed</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grades in graduate courses</td>
<td>GLO1</td>
<td>Data come from Banner reports; use, e.g., “more than one C” as deficient, “only one C” as marginal, “no grade &lt;B” as satisfactory, “all A’s” as excellent</td>
</tr>
<tr>
<td>Qualifying Exam</td>
<td>GLO1, GLO4</td>
<td>Evaluation form used by examiners (see appendix)</td>
</tr>
<tr>
<td>Research Proposal</td>
<td>GLO1, GLO2, GLO3, GLO4, GLO5</td>
<td>Evaluation form used by evaluators (see appendix)</td>
</tr>
<tr>
<td>Dissertation and Defense</td>
<td>GLO1, GLO2, GLO3, GLO4, GLO5</td>
<td>Evaluation form used by dissertation committee (see appendix)</td>
</tr>
<tr>
<td>Peer Reviewed Publications</td>
<td>GLO3</td>
<td>Data collected by program; use, e.g. “1 in preparation” as deficient, “1” as satisfactory and “&gt;1” as excellent</td>
</tr>
<tr>
<td>Conference Presentations</td>
<td>GLO3, GLO4</td>
<td>Data collected by program; use, e.g. “1 in preparation” as deficient, “1” as satisfactory and “&gt;1” as excellent</td>
</tr>
<tr>
<td>Seminars</td>
<td>GLO4</td>
<td>Evaluation form applied by faculty attendees (see appendix)</td>
</tr>
<tr>
<td>Teaching</td>
<td>GLO4</td>
<td>Evaluation form applied by teaching supervisor (see appendix)</td>
</tr>
<tr>
<td>Exit Surveys</td>
<td>GLO4</td>
<td>Conducted by the Graduate School; use, e.g., student placement numbers as a metric (see appendix)</td>
</tr>
</tbody>
</table>
III. MS Program(s)
   A. MS Graduate Learning Objectives (GLOs)

Articulate here the learning objectives that your program has adopted for its MS candidates. The number of objectives is not limited, but programs are encouraged to have no more than five objectives. When there is more than one pathway to the masters (e.g. thesis, report, coursework-only) the learning objectives may be different, but they must be equivalent. For example, a thesis or report masters would typically have a research objective while a coursework-only masters would not, but the coursework-only masters would instead include an objective of, for example, additional depth in a particular subject.

If desired, the programs may adopt, without change, the example list of Graduate Learning Objectives (GLOs) listed below. The number of objectives is not limited, but programs are encouraged to have no more than five objectives.


   When the path to the MS includes a thesis, the MS Graduate Learning Objectives of our program are:

   1. Demonstrate proficiency of the subject matter
   2. Demonstrate research skills (e.g. execute a research project)
      a) Apply existing research methodologies and techniques
      b) Critically analyze and evaluate one’s own findings and the findings of others
   3. Make a contribution to the discipline
   4. Demonstrate professional skills
      a) Effective written communication skills
      b) Effective oral communication skills
   5. Practice responsible conduct of research (field-appropriate)

2. Professional (Coursework-only) Path to the MS.

   When the path to the MS includes coursework only, the MS Graduate Learning Objectives of our program are:

   1. Demonstrate core proficiency of the subject matter
   2. Demonstrate knowledge of subject matter in selected, elective areas
   3. Demonstrate professional skills
      a) Effective written communication skills
      b) Effective oral communication skills
   4. Practice responsible conduct of the profession (field-appropriate)
A. Assessment Points for Measuring MS Graduate Student Learning Outcomes (GLSO)

Articulate here the assessment points your program has adopted to measure Graduate Student Learning Outcomes for its MS candidates.

If desired, the programs may adopt, without change, the example list of assessment points listed in black below. Those in grey are extra suggested tools.

<table>
<thead>
<tr>
<th>Assessment Points for Graduate Student Learning Outcomes (GSLO) (a measure of student attainment of Graduate Learning Objectives)</th>
<th>MS Graduate Learning Objectives addressed</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grades in graduate courses</td>
<td>GLO1</td>
<td>Data come from Banner reports; use, e.g., “more than one C” as deficient, “only one C” as marginal, “no grade &lt;B” as satisfactory, “all A’s” as excellent</td>
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<tr>
<td>Thesis and Defense</td>
<td>GLO1, GLO2, GLO3, GLO4, GLO5</td>
<td>Evaluation form used by dissertation committee (see appendix)</td>
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<tr>
<td>Peer Reviewed Publications</td>
<td>GLO3</td>
<td>Data collected by program; use, e.g. “1 in preparation” as deficient, “1” as satisfactory and “&gt;1” as excellent</td>
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<td>GLO3, GLO4</td>
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<td>Evaluation form applied by faculty attendees (see appendix)</td>
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<td>Exit Surveys</td>
<td>GLO4</td>
<td>Conducted by the Graduate School; use, e.g., student placement numbers as a metric (see appendix)</td>
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</tbody>
</table>
IV. Rubrics and Evaluation Forms (PhD and MS)

Rubrics and Evaluation Forms are used to collect results from a variety of assessment points. There are typically four levels assigned to the student performance, for example: Deficient, Marginal, Satisfactory, Excellent. Individual evaluation forms are designed for each assessment point, depending on which Graduate Learning Outcomes (GLO) they address. A common rubric within each degree (PhD, masters) may be used (makes the system simpler). Masters and PhD rubrics should not be the same, however. In addition, research masters (thesis and report) and professional masters (coursework-only) may need different rubrics.

Examples follow. In these example rubrics, highlighted text shows how expectations for masters and PhD candidates differ. Note that thesis, report, and professional (coursework-only) masters programs all result in the masters degree and must therefore be equivalent. Research expectations are not part of the professional masters degree, but these expectations are replaced by equivalent expectations in another valuable area, in this example, specialized knowledge. For this reason, the different masters pathways may need different rubrics.
<table>
<thead>
<tr>
<th>Graduate Learning Obj.</th>
<th>What is being assessed</th>
<th>Unacceptable</th>
<th>Marginal / Needs Improvement</th>
<th>Satisfactory</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Demonstrates mastery of the subject matter</td>
<td>Synthesizes existing knowledge</td>
<td>e.g. Does not understand basic concepts or conventions. Misinterprets or misuses sources.</td>
<td>Displays a basic understanding of the field.</td>
<td>Displays a solid understanding of the field. Adequate exploration of interesting issues and connections.</td>
<td>Demonstrates thorough mastery as well as creativity in drawing on multiple sources. Synthetic and interdisciplinary. Demonstrates a deep understanding of relevant literatures</td>
</tr>
<tr>
<td>2 - Demonstrates advanced research skills</td>
<td>Mastered application of existing methodologies and techniques</td>
<td>e.g. Misapplies or uses non-standard techniques without adequate rationalization.</td>
<td>Applies standard techniques. Does not recognize limitations of data / techniques were applicable.</td>
<td>Uses appropriate, theory, methods and techniques. Appropriately explains limitations of data / techniques were applicable.</td>
<td>Suggests and utilizes improvements to standard methods and techniques. Limitations are thoroughly and competently discussed.</td>
</tr>
<tr>
<td>3 - Make an original and substantial contribution to the discipline</td>
<td>Critically analyzes and evaluate their own findings and those of others</td>
<td>e.g. Does not recognize improbable results.</td>
<td>Relies on others to suggest data that are relevant to solving a problem. Literature review is adequate but not critical.</td>
<td>Identifies weaknesses in own work but discussion is not comprehensive.</td>
<td>Provides critical evaluation of previous works. Identifies and corrects weaknesses or flaws in referenced work. Identifies and discusses shortcomings in own work.</td>
</tr>
<tr>
<td>4 - Demonstrates professional skills</td>
<td>Displays effective written communication skills</td>
<td>e.g. Writing is disorganized, has frequent spelling and grammatical errors. Illustrations poorly selected or illegible.</td>
<td>Writing is adequate. Structure and organization are weak, but sufficient. Illustrations legible, technically correct, and appropriate.</td>
<td>Well written and organized.</td>
<td>Concise, elegant, engaging. Technical content and graphic design of illustrations well planned / executed.</td>
</tr>
<tr>
<td>5. 5. Practice responsible conduct of research (field-appropriate)</td>
<td>Understand and abide by the principles of Responsible Conduct of Research (RCR)</td>
<td>Little knowledge and understanding of RCR and/or displays willingness to violate principles of RCR</td>
<td>Partial but inadequate knowledge and understanding of principles of RCR and/or displays tendency to violate principles of RCR unintentionally or through negligence</td>
<td>Adequate knowledge and understanding of principles of RCR and abides by principles of RCR</td>
<td>Thorough knowledge and understanding of principles of RCR and strives to promote RCR in his/her own research and the research of others</td>
</tr>
</tbody>
</table>

Version 7 September 2017 Assessment Plan with Helpful Suggestions
### Sample Rubric for Evaluations (research masters) (print on back of masters evaluation forms)

<table>
<thead>
<tr>
<th>Graduate Learning Obj.</th>
<th>What is being assessed</th>
<th>Unacceptable</th>
<th>Marginal / Needs Improvement</th>
<th>Satisfactory</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Demonstrates proficiency of the subject matter</td>
<td>Is proficient in existing knowledge</td>
<td>e.g. Does not understand basic concepts or conventions. Misinterprets or misuses sources.</td>
<td>Displays a basic understanding of the field.</td>
<td>Displays an understanding of the field. Adequate exploration of interesting issues and connections.</td>
<td>Demonstrates proficiency as well as creativity in drawing on multiple sources. Synthetic and interdisciplinary.</td>
</tr>
<tr>
<td>2 - Demonstrates research skills (thesis &amp; report only)</td>
<td>Applied existing methodologies and techniques</td>
<td>e.g. Misapplies or uses non-standard techniques without adequate rationalization.</td>
<td>Applies standard techniques. Does not recognize limitations of data / techniques were applicable.</td>
<td>Uses appropriate, techniques. Appropriately explains limitations of data / techniques were applicable.</td>
<td>Suggests and utilizes improvements to standard techniques. Limitations are competently discussed.</td>
</tr>
<tr>
<td>3 - Make a contribution to the discipline (thesis &amp; report only)</td>
<td>Thinks to develop concepts &amp; methodologies; identify opportunities</td>
<td>e.g. Does not recognize improbable results.</td>
<td>Relies on others to suggest data that are relevant to solving a problem. Literature review is adequate but not critical.</td>
<td>Identifies weaknesses in own work but discussion is not comprehensive.</td>
<td>Provides critical evaluation of previous works. Identifies and corrects weaknesses or flaws in referenced work. Identifies and discusses shortcomings in own work.</td>
</tr>
<tr>
<td>4 - Demonstrates professional skills</td>
<td>Displays effective written communication skills</td>
<td>e.g. Writing is disorganized, has frequent spelling and grammatical errors. Illustrations poorly selected or illegible.</td>
<td>Writing is adequate. Structure and organization are weak, but sufficient. Illustrations legible, technically correct, and appropriate.</td>
<td>Well written and organized.</td>
<td>Concise, elegant, engaging. Technical content and graphic design of illustrations well planned / executed.</td>
</tr>
<tr>
<td>... oral communication skills</td>
<td>e.g. Disorganized or unable to articulate an argument. Does not grasp intent of questions.</td>
<td>Clear and coherent, partially understands or addresses questions, responses may have some gaps in logic or inconsistencies.</td>
<td>Clear &amp; coherent. Engages appropriate audiences. Grasps intent.</td>
<td>Compelling, persuasive, and accessible to multiple audiences. Articulately addresses questions.</td>
<td></td>
</tr>
<tr>
<td>5. Practice responsible conduct of research (field-appropriate)</td>
<td>Understand and abide by the principles of Responsible Conduct of Research (RCR)</td>
<td>Little knowledge and understanding of RCR and/or displays willingness to violate principles of RCR</td>
<td>Partial but inadequate knowledge and understanding of principles of RCR and/or displays tendency to violate principles of RCR unintentionally or through negligence</td>
<td>Adequate knowledge and understanding of principles of RCR and abides by principles of RCR</td>
<td>Thorough knowledge and understanding of principles of RCR and strives to promote RCR in his/her own research and the research of others</td>
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Version 7 September 2017 Assessment Plan with Helpful Suggestions
Sample Rubric for Evaluations (professional masters, i.e. coursework-only) (print on back of masters evaluation forms)

<table>
<thead>
<tr>
<th>Graduate Learning Obj.</th>
<th>What is being assessed</th>
<th>Unacceptable</th>
<th>Marginal / Needs Improvement</th>
<th>Satisfactory</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Demonstrates proficiency of the subject matter</td>
<td>Is proficient in existing knowledge</td>
<td>e.g. Does not understand basic concepts or conventions. Misinterprets or misuses sources.</td>
<td>Displays a basic understanding of the field.</td>
<td>Displays an understanding of the field. Adequate exploration of interesting issues and connections.</td>
<td>Demonstrates proficiency as well as creativity in drawing on multiple sources. Synthetic and interdisciplinary.</td>
</tr>
<tr>
<td>2 - Demonstrates proficiency of selected, elective subject matter</td>
<td>Is proficient in existing selected, elective knowledge</td>
<td>e.g. Does not understand basic concepts or conventions. Misinterprets or misuses sources.</td>
<td>Displays a basic understanding of the field.</td>
<td>Displays an understanding of the field. Adequate exploration of interesting issues and connections.</td>
<td>Demonstrates proficiency as well as creativity in drawing on multiple sources. Synthetic and interdisciplinary.</td>
</tr>
<tr>
<td>3 - Demonstrates professional skills</td>
<td>Displays effective written communication skills</td>
<td>e.g. Writing is disorganized, has frequent spelling and grammatical errors. Illustrations poorly selected or illegible.</td>
<td>Writing is adequate. Structure and organization are weak, but sufficient. Illustrations legible, technically correct, and appropriate.</td>
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<td>Clear &amp; coherent. Engages appropriate audiences. Grasps intent.</td>
<td>Compelling, persuasive, and accessible to multiple audiences. Articulately addresses questions.</td>
<td></td>
</tr>
<tr>
<td>4. Practice responsible conduct of research (field-appropriate)</td>
<td>Understand and abide by the principles of Responsible Conduct of Research (RCR)</td>
<td>Little knowledge and understanding of RCR and/or displays willingness to violate principles of RCR</td>
<td>Partial but inadequate knowledge and understanding of principles of RCR and/or displays tendency to violate principles of RCR unintentionally or through negligence</td>
<td>Adequate knowledge and understanding of principles of RCR and abides by principles of RCR</td>
<td>Thorough knowledge and understanding of principles of RCR and strives to promote RCR in his/her own research and the research of others</td>
</tr>
</tbody>
</table>
## Evaluation of PhD Graduate Student Learning Outcomes—PhD Qualifying exam written & oral

**Semester / Year ______________**

### Committee decisions

**GLO1: Demonstrate mastery of the subject matter**

Circle one:  Deficient  Marginal  Satisfactory  Excellent

**GLO4: Demonstrate professional skills (effective written communication)**

Circle one:  Deficient  Marginal  Satisfactory  Excellent

**GLO4: Demonstrate professional skills (effective oral communication)**

Circle one:  Deficient  Marginal  Satisfactory  Excellent

### Overall Determination:  

Fail  Provisional Pass  Pass

### Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Version 7 September 2017 [Assessment Plan with Helpful Suggestions]
Evaluation of PhD Graduate Student Learning Outcomes - Dissertation and Defense

Semester / Year _____________

Committee decisions

GLO1: Demonstrate mastery of the subject matter
Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Demonstrate advanced research skills
Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Make an original and substantial contribution to the discipline
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective written communication)
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective oral communication)
Circle one: Deficient Marginal Satisfactory Excellent

GLO5: Practice responsible conduct of research (field-appropriate)
Circle one: Deficient Marginal Satisfactory Excellent

Overall Determination: Fail Provisional Pass Pass

Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

Version 7 September 2017 Assessment Plan with Helpful Suggestions
Evaluation of PhD Graduate Student Learning Outcomes - Research Proposal

Semester / Year _______________

Committee decisions

GLO1: Demonstrate mastery of the subject matter
Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Demonstrate advanced research skills
Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Make an original and substantial contribution to the discipline
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective written communication)
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective oral communication)
Circle one: Deficient Marginal Satisfactory Excellent

GLO5: Practice responsible conduct of research (field-appropriate)
Circle one: Deficient Marginal Satisfactory Excellent

Overall Determination: Fail Provisional Pass Pass

Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Version 7 September 2017 Assessment Plan with Helpful Suggestions
Evaluation of MS Graduate Student Learning Outcomes - Thesis and Defense

Semester / Year ______________

Committee decisions

GLO1: Demonstrate mastery of the subject matter
Circle one: Deficient Marginal Satisfactory Excellent

GLO2: Demonstrate advanced research skills
Circle one: Deficient Marginal Satisfactory Excellent

GLO3: Make an original and substantial contribution to the discipline
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective written communication)
Circle one: Deficient Marginal Satisfactory Excellent

GLO4: Demonstrate professional skills (effective oral communication)
Circle one: Deficient Marginal Satisfactory Excellent

GLO5: Practice responsible conduct of research (field-appropriate)
Circle one: Deficient Marginal Satisfactory Excellent

Overall Determination: Fail Provisional Pass Pass

Consensus comments of the reviewing faculty (comments required if Deficient or Marginal scores are earned):

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

Version 7 September 2017 Assessment Plan with Helpful Suggestions
V. Data Compilation Plan

Departmental faculty are to compile and review annually the graduate student learning outcomes data, compare graduate student learning outcomes from prior years to the current year, and compare student learning outcomes against the intended Graduate Learning Objectives. Indicate here how your program plans to meet this requirement.

Departments are directed to retain annual Data Compilations for all the years between external review cycles. Access to these may be requested by reviewers during external program review visits.

Care should be taken in assessment plan design that the assessment program is sustainable. Use this section to assess the effort of the program you design, and make adjustments, if necessary.