Graduate Biennial Program Plan & Assessment Report

Program Information: (Modify table as needed)	
Degree/s Assessed	MS in Computer Science
College or Administrative Division	College of Engineering
Department/School	Gianforte School of Computing
Report Submitted By	Mike Wittie
Date Submitted	9/15/19
Assessment Period:	Sept 2017 – Aug 2019

Graduate assessment reports are to be submitted biennially. The report deadline is September 15th.

Every graduate report must have the following key components.

Part 1: Assessment Plan

Program Learning Outcomes (PLOs): PLOs should be written as specific, measureable statements describing what students will be able to do upon completion of the program. The assessment of PLOs provide feedback on the accumulated knowledge, skills, and attitudes that students develop as they progress through their graduate program. Plans should include PLO's that would cover all types of graduate programs, depending on the nature of your programs (i.e. Master's Thesis, Professional, Course work, Doctoral Dissertation, or Certifications).
(For help in developing learning outcomes see "Program Assessment Overview", under Resources on Provost Page: https://www.montana.edu/provost/assessment/program_assessment.html)

Threshold Values: Along with PLOs, plans should include threshold values; minimums against which to assess student achievement for learning outcomes. Threshold values are defined as an established criteria for which outcome achievement is defined as met or not met.

Methods of Assessment & Data Source: Assessment plans require evidence to demonstrate student learning at the program level. This evidence can be in the form of a direct or indirect measure of student learning. Both direct and indirect assessment data must be associated with the program's learning outcomes. An assessment rubric will also need to be included that demonstrates how evaluation of the data was used to assess student achievement.

Timeframe for Collecting and Analyzing Data: Provide a multi-year assessment schedule that will show when all program learning outcomes will be assessed. As graduate assessment reports are biennial, faculty review of assessment results may only occur every other year, however, annual faculty meeting to review these data and discuss student progress may be beneficial.

Part 2: Program Assessment

The assessment report should identify how assessment was conducted, who received the analyzed assessment data, and how it was used by program faculty for program improvement(s). Assessment reports should also reflect on previous assessment and program improvements by identifying previous program-level changes that have led to outcome improvements.

NOTE: Student names must not be included in data collection. Dialog on successful completions, manner of assessment (e.g., publications, thesis/dissertation, or qualifying exam) may be presented in table format if they apply to learning outcomes. In programs where numbers are very small and individual identification can be made, focus should be on programmatic improvements rather than student success. Data should be collected through the year on an annual basis.

Part 1: Program Assessment Plan

A) Program Description (from catalog):

From http://catalog.montana.edu/graduate/engineering/computer-science/#graduatetext

A Bachelor's degree in Computer Science is recommended. Students with non-computer science degrees at the Bachelor's level or above are also encouraged to apply; such students will generally be required to take appropriate courses while enrolled at MSU to make up computer science and related subject matter deficiencies prior to full acceptance into the computer science Master's program. Factors that the department uses in its admissions process include GRE scores, TOEFL scores (for non-native English speakers), reference letters, GPA and previous coursework. For more information, please refer to www.cs.montana.edu/future-students-masters-program.html.

From https://www.cs.montana.edu/masters/

The faculty and staff of the Gianforte School of Computing extend a hearty welcome to students of all nationalities and backgrounds interested in obtaining a Master of Science (MS) degree in Computer Science. With the industry embracing new technologies such as machine learning, blockchains, and augmented reality, now is a great time to pursue an advanced degree in Computer Science.

Our goal is to empower you with knowledge and a degree that will make you desirable and marketable to future employers. Our faculty and visiting industry practitioners offer foundational and project-based courses relevant to senior software developers, system engineers and data scientists. Through our close working relationships with high tech companies in the Bozeman area you will have opportunities to become involved with open source projects and internships. To develop advanced skills that companies and startups value, you will explore emerging technologies through independent studies with our research-active faculty.

B) Program Learning Outcomes, Assessment Schedule, Methods of Assessment, & Threshold Values

ASSESSMENT PLANNING CHART						
PROGRAM LEARNING OUTCOMES	2016-2017	2017-2018	2018-2019	2019-2020	Data Source	Threshold Value
Thesis and courses-only track: Demonstrate technical expertise in the fundamental areas of computer science.	x	x	x	x	Course grades and comprehensive examination	Students must either have a 3.5 GPA at the start of the semester in which they graduate, or receive a passing grade on the comprehensive examination.
Thesis and courses-only track: Integrate their knowledge of disparate computer science subjects.	x	x	x	x	Course grades and comprehensive examination	Students must either have a 3.5 GPA at the start of the semester in which they graduate, or receive a passing grade on the comprehensive examination.
Thesis and courses-only track: Effectively communicate knowledge to a scientific audience.	x	x	x	x	Presentation and written report assignments in graduate computer science courses	80% of students pass courses in-class presentation or written report assignments
Thesis track: Effectively communicate research to a scientific audience.	x	x	x	x	Thesis defense	80% of thesis students pass their defense
Thesis track: Perform original research.	x	x	x	x	Thesis	80% of thesis students have their thesis accepted by their graduate committee

Part 2: Program Assessment Results

A) What Was Done

1) Was the completed assessment consistent with the plan provided? YES__X___ NO_____

If no, please explain why the plan was altered.

2) Please provide a rubric that demonstrates how your data was evaluated.

Component	**Expectations not met**	**Meets Expectations**	**Exceeds Expectations**
Grade Point Average	Student fails to maintain a 3.0 GPA over foundational courses and courses on the program of study	Student maintains a 3.0 GPA over foundational courses and courses on the program of study	Student maintains a 3.0 GPA over foundational courses and 3.5 GPA over courses on the program of study
Comprehensive examination	Student reviews a computer science research paper but fails to adequately explain the technical problem, or the mechanisms behind the technical solution	Student reviews a computer science research paper and summarizes paper motivation, the technical problem, and the technical solution	Student reviews a computer science research paper and clearly summarizes paper motivation, the technical problem, the technical solution, and the broader impact of the solution in computer science, or the broader society.
Thesis defense	Student fails to motivate the work and explain their technical contribution	Student motivates their work, explains their technical contribution, and evaluates its performance with data. The solution has some novelty.	Student motivates their work, explains their technical contribution, and evaluates its performance with data. The solution is novel.

Thesis	Student fails to motivate the work and explain their technical contribution.	Student motivates their work, explains their technical contribution, and evaluates its performance with data. Solution novelty is framed with some related work.	Student motivates their work, explains their technical contribution, and evaluates its performance with data. Solution novelty is explained with adequate related work.

B) What Was Learned: Results

Please include who received the analyzed assessment data, and how it was used by program faculty for program improvement (s).

1) Who were the recipients of the analyzed assessment data?

The notification of students passing, or being exempt from comprehensive examination has been passed to the Graduate School each semester for the graduating students.

2) Areas of strength

The assessment measures student performance throughout their time in the program through the GPA and at the end of the program through the comprehensive examination.

3) Areas that need improvement

The assessment methods and thresholds should be communicated to students through the school's website.

4) What else was learned?

Not applicable, the vast majority of our M.S. students are meeting or exceeding our expectations.

C) Use of Assessment Data

1) Based on the faculty responses, will there be any curricular or assessment changes (such as plans for measurable improvements, or realignment of learning outcomes)?

YES_____ NO__X_____

If yes, when will these changes be implemented?

2) When will the changes be next assessed?

In two years.

3) What are your goals moving forward?

We are considering developing courses for an M.S. in Cybersecurity that is under consideration. We are also considering developing courses for a recently launched M.S. in Data Science - this degree has options in Math, Statistics and Computer Science.

D) Closing the Loop

Reflect on previous assessment and program improvements by identifying previous program level changes that have led to outcome improvements.

1) What was identified as an area for improvement from the last report?

The last report did not identify any areas for improvement.

2) What was implemented to improve these outcomes?

Not applicable.

3) What impact have the changes had (if any) on achieving the desired level of student learning outcomes?

Not applicable.

Submit report to programassessment@montana.edu