MSU Departmental Assessment Plan
2018-2020

Department: Gianforte School of Computing (Computer Science)

Director: John Paxton

Assessment Coordinator: John Paxton

<u>Degrees/Majors/Options Offered by Department</u>

- B.S. in Computer Science
  - Interdisciplinary Option
  - Professional Option
- B.A. in Computer Science (launched in Fall 2018)
- M.S. in Computer Science
- Ph.D. in Computer Science

Department of Computer Science
Montana State University

Student Outcomes Assessment Plan
Professional and Interdisciplinary Options
Fall 2018

The Department of Computer Science BS degree is accredited by ABET. It has a Mission Statement that outlines clear and precise objectives and outcomes. In accordance with ABET and the College of Engineering, the department defines **Program Educational Objectives** to be skills that we expect our graduates to have 5 years after graduation, and **Program Outcomes** to be the skill set that students have at the time of graduation.

The accreditation body also requires that the department regularly assess its success in achieving these goals and objectives. The evaluation cycle is described below and illustrates how students, an industry advisory board, employers and graduates are all involved in the evaluation process.

Mission Statement

The Gianforte School of Computing at Montana State University supports the Mission of the College of Engineering and the University through its teaching, research, and service activities. We educate undergraduate and graduate students in the principles and practices of computer science, preparing them for computing careers and for a lifetime of learning.

Vision Statement

The Gianforte School of Computing at Montana State University is a leader in computing innovation through excellence in undergraduate and graduate education, active research programs, and the dissemination of knowledge. We leverage both the international and interdisciplinary nature of computing. We provide a collegial, inclusive, equitable environment that enables diverse faculty, staff, and students to achieve excellence in our mission.

Program Education Objectives: After graduation, graduates will:

1. is well prepared for a professional career in computing or graduate studies in computer science.
2. can apply computer science principles to identify problems and build solutions.
3. has appropriate social and professional skills to work effectively within a diverse organization.
4. understands ethical, professional and social issues related to the computing profession.
5. engages in continuous learning.

Program Outcomes (through Summer 2019): At the time of graduation, students will have:

a. an ability to apply knowledge of computing and mathematics appropriate to the discipline
b. an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
c. an ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs
d. an ability to function effectively on teams to accomplish a common goal
e. an understanding of professional, ethical, legal, security, and social issues and responsibilities
f. an ability to communicate effectively with a range of audiences
g. an ability to analyze the local and global impact of computing on individuals, organizations and society
h. recognition of the need for, and an ability to engage in, continuing professional development
i. an ability to use current techniques, skills, and tools necessary for computing practices
j. an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
k. an ability to apply design and development principles in the construction of software systems of varying complexity

Program Outcomes (effective Fall 2019): At the time of graduation, students will be able to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

Assessment Tools

The following tables show the program outcomes that each assessment tool measures. The Graduating Senior Survey makes indirect measurements. The other two tools make direct measurements.

Assessment through Summer 2019

	a	b	c	d	e	f	g	h	i	j	k
Graduating Sr. Survey	x	x	x	x	x	x	x	x	x	x	x
Custom Test	x	x			x		x	x	x		x
Portfolio		x	x	x		x			x	x	x

Assessment starting in Fall 2019 (using revised Program Outcomes)

	1	2	3	4	5	6
Graduating Sr. Survey	x	x	x	x	x	x
Custom Test		x	x	x		
Portfolio	x				x	x

The following table shows how often each tool is used and a schedule for its usage.

	How Often	**Inaugurated**	**Most Recent**	**Next**	**Next**
Graduating Senior Survey	Annually	April 2005	April 2018	Nov. 2018	April 2019
Custom Test	Each semester	April 2009	April 2018	Nov. 2018	April 2019
Portfolio	Annually	May 2009	May 2018	May 2019	May 2020

The following table shows the intended audience for each tool, how the tool is administered and who has responsibility for the tool.

	Audience	How Administered	Responsibility
Graduating Senior Survey	Graduating seniors	e-mail notification for SurveyMonkey	Assessment expert
Custom Test	Graduating seniors	Part of CSCI 481, monitored by a faculty member	Assessment committee
Portfolio	Teams of students in capstone courses	Done in capstone courses (468 and 483)	Assessment committee

In addition to the formal tools listed in the tables, faculty might use the following information to help make assessment decisions:

- Faculty experience. By teaching courses and advising students, the faculty develop ideas for improvement.

- Online course evaluations. Students are given the opportunity to evaluate each course each semester. Summaries of these evaluations are discussed at least once per year at a faculty meeting.

- Town meetings. Town meetings are open forums that allow students to talk about their experiences in our program and provide feedback.

- Feedback from other departments. The GSoC serves students from other majors, such as the Electrical and Computer Engineering Department. These departments sometimes provide feedback regarding how well our courses meet their students' needs.

- Recruiter and advisory board comments. Employers often share the skills and abilities they are seeking and provide informal feedback on MSU students who were hired.

- Informal student comments. Students often share suggestions about how the curriculum can be improved with individual faculty or staff members.

Evaluators

The following groups of people are instrumental in evaluating the information gathered by the assessment tools:

- GSoC assessment committee: Hunter Lloyd, Brendan Mumey, Binhai Zhu.
- GSoC director: John Paxton.
- GSoC faculty: please see https://www.cs.montana.edu/industry-advisory-board.html for membership.
- GSoC advisory board: please see our https://www.cs.montana.edu/directory/ for membership.

- An assessment expert: Carolyn Plumb (NACOE)

Evaluation Process

- Graduating Senior Survey
    - The assessment expert summarizes the results and gives them to the GSoC director.
    - The results are discussed at the annual GSoC retreat in August. Curricular recommendations are made and enacted.
    - The recommendations are discussed at the annual GSoC advisory board meeting in February.
    - The changes are monitored to see whether they are effective.
- Custom Test.
    - The GSoC Assessment committee grades the test using a pre-designed rubric and summarizes the results.
    - The second, third and fourth steps for the Graduating Senior Survey are followed.
- Portfolio
    - Same process as for the Custom Test.