

Student Outcomes Assessment and Success Report AY2017-18

Completed reports due from the dean to the Assessment Office via Blackboard by October 15. Deans, assessment coordinators, and/or department chairs set their own internal deadlines for material review and request for refinement if not suitably addressing questions.

Unit/Program Name: Computer Science MS **Contact Name(s) and Email(s)** Jeff Kinne, jkinne@indstate.edu

Before you complete the form below, review your outcomes library and curriculum map to ensure that they are accurate and up to date. If not, you may submit a new version along with this summary. Templates are available on the [assessment website](#).

Part 1a: Summary of Assessment Activities

<p>a. What learning outcomes did you assess this past year?</p> <p>If this is a graduate program, identify the Graduate Student Learning Outcome each outcome aligns with.</p>	<p>b. (1) What assignments or activities did you use to determine how well your students attained the outcome? (2) In what course or other required experience did the assessment occur?</p>	<p>c. What were your expectations for student performance?</p>	<p>d. What were the actual data/results?</p>	<p>e. What changes or improvements were made or will be made in response to these assessment results or feedback from previous year's report?</p>
<p><u>1 Reinforce Core CS Skills</u> <i>G4, G5</i></p>	<p>Programming assessment</p> <p>Exit Survey questions 6a-6o</p>	<p>All graduating students pass the programming assessment with a score of 4/5 or higher.</p> <p>Average response on Exit Survey at or above "Mostly Mastered"</p>	<p>All students who graduated passed the assessment.</p> <p>Responses for full, mostly, somewhat, no mastery: 7,7,0,0 (basic programming) 5,4,5,0 (multiple languages) 4,5,5,0 (data structures) 5,5,3,0 (algorithms) 4,5,2,3 (systems) 3,7,2,2 (software design) 5,6,3,0 (database) 6,8,0,0 (web) 3,4,4,2 (networks) 2,4,5,2 (graphics) 3,2,3,5 (AI) 4,6,4,0 (unix/linux) 4,5,2,2 (algorithm design) 5,2,5,2 (models of computation) 3,1,5,4 (formal methods)</p>	<p>A large focus this year was on the programming assessment to ensure <i>all</i> graduating students meet a good minimum standard. There were review sessions, study materials, and many chances for the students to take the assessment.</p>

	CS 685/695/699 & BIO 692/699 Evaluation questions 5a, 5b, 5c	All students rated on Evaluation questions at or above "Some Mastery"	<i>Evaluation was not collected from faculty this academic year.</i>	
<u>2A Algorithms</u> G4, G5	Exit Survey questions 6d, m, n	Average response on Exit Survey at or above "Mostly Mastered"	Responses for full, mostly, somewhat, no mastery: 4,5,2,2 (algorithm design) 5,2,5,2 (models of computation)	
<u>2B Large Software Projects</u> G4, G5	CS 685/695/699 & BIO 692/699 Evaluation question 5d	All students rated on Evaluation questions at or above "Some Mastery"	<i>Evaluation was not collected from faculty this academic year.</i>	
<u>2C Independent Research</u> G3, G4, G5	CS 685/695/699 & BIO 692/699 Evaluation question 5e	All students rated on Evaluation questions at or above "Some Mastery"	<i>Evaluation was not collected from faculty this academic year.</i>	
<u>2C Bioinformatics</u> G1, G2, G4, G5	Exit Survey questions 6t, 6u, 6v, 6w CS 685/695/699 & BIO 692/699 Evaluation question 5f	Average response on Exit survey at or above "Mostly Mastered" All students rated on Evaluation questions at or above "Mostly Mastered"	<i>There were no students completing the concentration this year.</i>	
<u>3A Working in Groups</u> G1, G2	Exit Survey questions 6q	Average response on Exit Survey at or above "Somewhat Mastered"	Responses for full, mostly, somewhat, no mastery: 6,2,3,3	
<u>3B Presentation Skills</u> G1	Exit Survey questions 6r CS 685/695/699 & BIO 692/699 Evaluation question 5f	Average response on Exit Survey at or above "Some Mastery" All students rated on Evaluation questions at or above "Some Mastery"	Responses for full, mostly, somewhat, no mastery: 5,5,4,0 <i>Evaluation was not collected from faculty this academic year.</i>	
<u>3C Writing Skills</u> G1	Exit Survey questions 6s CS 685/695/699 & BIO 692/699 Evaluation question 5g	Average response on Exit Survey at or above "Some Mastered" All students rated on Evaluation questions at or above "Some Mastery"	Responses for full, mostly, somewhat, no mastery: 5,6,2,1 <i>Evaluation was not collected from faculty this academic year.</i>	

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Note: *If you would like to report on more than three outcomes, place the cursor in the last cell on the right and hit “tab” to add a new row.*

Notes

- a. Use your outcomes library as a reference.
- b. Each outcome must be assessed by at least one direct measure (project, practica, exam, performance, etc.). If students are required to pass an examination to practice in the field, this exam must be included as one of the measures. At least one of the program’s outcomes must use an indirect measure (exit interview, focus group, survey, etc.). Use your curriculum map to correlate outcomes to courses.
- c. Identify the score or rating required to demonstrate proficiency (e.g., Students must attain a score of “3” to be deemed proficient; at least 80% of students in the program will attain this benchmark.”
- d. Note what the aggregate level of proficiency actually was and the number of students included in the cohort or sample (e.g., “85% of the 25 students whose portfolios were reviewed met the established benchmark”).

Part 1b: Continuous Quality Improvement

In no more than one page, summarize 1) the discoveries assessment has enabled you to make about student learning (a. What specifically do students know and do well—and less well? b. What evidence can you provide that learning is improving?); 2) what your assessment plan will focus on in the coming year; and 3) how will this information be shared with other stakeholders?

In 2016-2017, a programming assessment was given to BS and MS students at a few key points in the curriculum. The assessment was developed to measure the most basic and important programming and algorithms skills. The average score on the programming assessment in 2016-2017 was not acceptable (around 50%, with a goal of 80%). A decision was made to require a score of 4 out of 5 to earn better than a C in the first programming course (CS 500 Programming Fundamentals), and in order to graduate (to pass the culminating experience). The same programming assessment was used for both BS and MS students. The faculty provided numerous solved sample problems, provided notes and advice on techniques, and provided screen capture videos of problems being solved. During the fall 2017 semester, the assessment was given a total of 7 times. Students kept taking the assessment and working on their program until they were able to pass. In the spring 2018 semester, a similar schedule was followed. A few students who did not pass the assessment in the fall of 2017 were given the option to take the assessment remotely if they had moved away from Terre Haute; all of these students were able to pass during the spring of 2018.

We are very happy to report that all graduating students were able to pass the programming assessment. We view the process as a great success. It has been a lot of work for the faculty and students, but it has resulted in much higher performance in the key area of programming and algorithms.

For 2018-2019, we will keep a focus on the programming assessment to ensure the assessment continues as both a formative and summative assessment and does not become a barrier to progressing through the program. We also are considering adding a second component that focuses more on problem solving, and rebranding the whole process as a “qualifying exam” to be written into the curriculum (currently the process is part of key courses, so it could be piloted without modifying the program itself).

We will continue to make use of the exit survey. This has been valuable data in allowing us to see how students see their skills across computer science.

We did not collect faculty evaluation forms during 2017-2018 because our sole focus was on the programming assessment. We will resume the faculty evaluations of the culminating experience in 2018-2019.

Part 2a: Summary of Student Success Activities

Based on the results of your assessment of student learning outcomes from Part 1 above, reflect on how this data will impact student success within your unit/program.

a. What goals/objectives were established this past year to aid student performance, retention, persistence, and completion?	b. What primary action steps were taken to make progress on each goal and who was responsible?	c. What data informs progress on each goal?	d. What were some accomplishments or achievements for each goal and/or challenges confronted?	e. Please indicate goals that are continuing and any goals that will replace a previous goal. Any additional goals can also be added on a new line.
1. All students pass the programming assessment before graduation.	Prep materials provided, practice sessions. Coordinated by Jeff Kinne in fall, Rob Sternfeld in spring.	Scores on the programming assessment for all students who took it.	All graduating students passed the programming assessment.	Goal remains the same – all students pass the programming assessment before graduation.
2. Clear communication on advising.	Program websites with program and advising information. Email list of students to communicate key information.	NA	NA	We will be doing an overhaul of all of our online information to reorganize and make sure it is clear.
3. Review and update of course syllabi and learning outcomes.	Perform a review of course syllabi and learning outcomes.	NA	Developed a standard syllabus template for CS courses, and reviewed learning outcomes for key courses.	Continue to review and update learning outcomes for CS courses.

Notes

- a. These goals could be program/department wide but may also be focused on specific sub-populations of interest (e.g., service course student performance, transfer students, part-time students, students of a particular class year, students of color, etc.).
- c. Retention and completion data, D/F/drop rates, credit hour productivity (defined as credit hour enrollment at start of term versus credit hours earned at end of term) are common data examples. See [Blue Reports](#) database (access from Linda Ferguson in Institutional Research) or the [Office of Institutional Research](#) for ideas.

Part 2b: Continuous Quality Improvement

In no more than one page, summarize 1) the discoveries that attention to student performance, retention, persistence, and completion has enabled you to make about program/department systems, processes, and norms as it effects students; and 2) how this will positively impact student success, including with regard to the readiness of students for graduate study or a career?

We have focused on relatively common sense things that should be done to help students. We have a tutoring lab that is open 30+ hours per week and is well advertised. We have clear advising information on our website and communicated by email to all CS majors, linked off of our homepage - <http://cs.indstate.edu/info/>
We plan to make a major overhaul of the information on our website, putting it into a wiki format that is easier to keep up to date. Our work in progress is at http://cs.indstate.edu/wiki/index.php/Main_Page

We are considering a revision to the CS MS to incorporate a qualifying exam process (to be used in place of the programming assessment) and to include newly created courses that will launch with an MS in Data Science & Analytics (some new courses have been approved already, others are likely to be approved this year).

We are also looking to create a 4+1 accelerated program framework, with two groups in mind – (a) students completing a BS in CS, (b) students looking to switch into CS from other areas.

And we are also looking to begin transitioning to put some CS MS courses online. International enrollment has significantly decreased, and we believe that online enrollment could replace that lost enrollment.

We have constituted an advisory board that is consulted about program assessment and other issues. The advisory board is listed at <http://cs.indstate.edu/info/advisory-board.html>

The advisory board has responded to the college's request for alumni mentors. The CS alumni mentors are listed at <https://www.indstate.edu/cas/mentors/mathcs>

Our faculty pay close attention to faculty trends to make sure our students are competitive for jobs and graduate programs. Companies our students have been placed in are listed at <http://cs.indstate.edu/info/after-isu.html#alumniJobs>

We have developed a syllabus template that meets all CS courses now use - https://docs.google.com/document/d/1VmSebAOSwdViyQJ0kCdPillYmA2sx0ieR_zg8MzFrYo/edit
We have also begun a review of all course descriptions and learning outcomes - <https://docs.google.com/document/d/1luwTgm3GltR0j-wD64Q3MHPAAAnjOb8L6OrFJ2YV6UXY/edit?usp=sharing>

Please prepare this report as a Word document. Do not include any attachments. Instead, provide links to important supporting materials (e.g., detailed—but not student-specific—assessment results; rubrics; minutes; etc.), or upload them to the college's assessment site in Blackboard.

Dear Jeff,

Thank you so much for sharing your assessment process and findings for AY 2017-18 with the Assessment and Student Success Councils. You will find a comprehensive synthesis of the feedback compiled by both groups below. It is understood that some of the feedback might encompass practices that you already engage in but that are not documented in this report. As the purpose of this evaluation is focused on recognizing great work and helping faculty improve assessment practice, it is not necessary to retroactively add documentation. Please feel free to let me know if you have any questions or if there is any way I can assist you in further developing assessment in your program.

This report will be shared with the Associate Dean(s) and Dean of your college and summarized findings will be shared as composite college/institutional data with the President's Office and the Provost's team.

Sincerely,

Kelley (x7975)

Program: MS Computer Science	
Assessment Practice Overall Rating: Mature (2.06/3.00)	
Student Success Practice Overall Rating (notes below in blue): Developing (1.125/3.00)	
Strengths	Recommendations
<ul style="list-style-type: none">• Good connection of outcomes to the Graduate Student Learning Outcomes.• Clear information provided about direct assessment using the programming assessment and indirect assessment using specific questions from the exit survey and the evaluations.• Clear information about expectations for performance and actual student performance.• Excellent information about the decision to add multiple points of data from the programming assessment.	<ul style="list-style-type: none">• Make sure to put your actual student learning outcomes for assessment in the table in the future. I saw them written in expanded detail in the attached documents.• Consider reviewing not only senior pass rates on the final programming assessment but also learning growth from the first assessment to the final assessment.• Consider adding information about how assessments were evaluated (ex: it seems the exit survey used a Likert scale for data).• Add some information about what was learned from the exit survey and how that has been used to inform your work.• Add information about how faculty are made aware of the findings of these assessments.• Narrative does not match goals. Student Success practice appears to be happening, but documentation is weak. Improve connections between narrative and goals and clarify documentation of performance.

Assessment (Parts 1a & 1b) Scoring Rubric is included below. Student Success (Parts 2a & 2b) Scoring Rubric is included on the last page for reference only. Score was calculated on a 0 (undeveloped), 1 (developing), 2 (mature), 3 (exemplary) scale.

Evaluation Criteria	Exemplary	Mature	Developing	Undeveloped
<p>Student Learning Outcomes</p>	<p>At least one learning outcome that is aligned with program coursework is assessed this cycle.</p> <p>Learning outcome(s) is specific, measurable, and student-centered.</p> <p>Rationale for assessment of this outcome(s) is made clear (ex: it is part of a standing assessment cycle, a need was identified, etc.)</p> <p>Learning outcome(s) directly link to college, institutional, and/or accreditor goals/standards.</p>	<p>At least one learning outcome that is aligned with program coursework is assessed this cycle.</p> <p>Learning outcome(s) is specific, measurable, and student-centered.</p> <p>Rationale for assessment of this outcome(s) is made clear (ex: it is part of a standing assessment cycle, a need was identified, etc.)</p>	<p>At least one learning outcome that is aligned with program coursework is assessed this cycle.</p> <p>Learning outcomes(s) is measurable.</p>	<p>No learning outcomes are identified for assessment or the outcomes that are identified are not linked to program outcomes aligned with program coursework (e.g. – curriculum map) or are not measurable.</p>
<p>Performance Goals & Measures</p>	<p>Performance goal identified for each learning outcome is clear and reasonable (ex: based on previous performance data, professional standards, etc.).</p> <p>Identified measures are designed to accurately reflect student learning, including at least one direct measure.</p> <p>Tools used to measure student performance are described and were reviewed for validity or trustworthiness prior to use (note this in the report; attach tools if applicable – ex: rubrics, checklists, exam keys, etc.).</p>	<p>Performance goal identified for each learning outcome is clear and reasonable (ex: based on previous performance data, professional standards, etc.).</p> <p>Identified measures are designed to accurately reflect student learning, including at least one direct measure.</p> <p>Tools or processes for evaluating student performance on measures are described (attach tools if applicable – ex: rubrics, checklists, exam keys, etc.).</p>	<p>Performance goal(s) is identified for each learning outcome.</p> <p>Identified measures (ex: assignments, projects, tests, etc.) are poorly suited to performance goals or are solely indirect measures.</p> <p>Tools or processes for evaluating student performance on measures are not described.</p>	<p>No goals for student performance of learning outcomes is identified, and/or no measures are provided.</p>

Analysis & Results	<p>Data is collected using the measures and tools identified.</p> <p>Results are reported with clear description of quality analysis (e.g., analysis follows accepted statistical or qualitative procedures).</p> <p>Results are shared in relation to performance goals.</p> <p>Results are discussed in relation to college, institutional, and/or accreditor goals/standards.</p>	<p>Data is collected using the measures and tools identified.</p> <p>Results are reported with clear description of analysis (e.g., analysis follows accepted statistical or qualitative procedures).</p> <p>Results are shared in relation to performance goals.</p>	<p>Data is collected using the measures and tools identified.</p> <p>Results are reported with little description of analysis.</p>	<p>No data is being collected.</p> <p>No results are provided.</p>
Sharing & Use of Results for Continuous Improvement	<p>Clear information is provided about sharing and using results to inform practice.</p> <p>Discussion of what was learned from results is provided and connected to plans for sharing and using results to inform practice.</p> <p>A plan for adjusting performance, goals, assessment, and/or program components based on results is outlined.</p>	<p>Clear information is provided about sharing and using results to inform practice.</p> <p>Discussion of what was learned from results is provided and connected to plans for sharing and using results to inform practice.</p>	<p>Limited information is provided about sharing or using results to inform practice.</p> <p>Some discussion of what was learned from results is provided.</p>	<p>No information is provided about sharing or using results to inform practice.</p> <p>No evidence of reflection on results is provided (ex: discussion, conclusions drawn)</p>
Overall Rating	<input type="checkbox"/> Exemplary	<input checked="" type="checkbox"/> Mature	<input type="checkbox"/> Developing	<input type="checkbox"/> Undeveloped

Student Success Activities Report Rubric (Part 2 of Student Outcomes Assessment Report)Unit/Program:

Office of Student Success/Office of Assessment & Accreditation Evaluation Date:

Evaluation Criteria	0 Undeveloped	1 Developing	2 Mature	3 Exemplary
Goals/ Objectives	No goals/objectives are identified.	Goals/objectives are poorly suited to addressing student performance, retention, persistence, and/or completion. Goals/objectives may also be modest at best such that little effort is required.	Goals/objectives are generally clear and reasonably well suited to addressing student performance, retention, persistence, and/or completion. Goals/objectives are also generally at least moderately aggressive such that appropriate effort is required.	Goals/objectives are all clear and well suited to addressing student performance, retention, persistence, and/or completion. Goals/objectives are also at least moderately aggressive in all cases such that appropriate effort is required.
Action Steps	No action steps are identified.	Action steps are weak, underdeveloped, and/or poorly suited to making progress on goals/objectives. No person(s) or group(s) indicated who will be responsible for the actions.	Action steps are generally clear and reasonably well suited to making progress on goals/objectives. Person(s) or group(s) responsible for the actions are indicated in most cases.	Action steps are all clear and well suited to making progress on goals/objectives Person(s) or group(s) responsible for each action are indicated, ideally with a timeline.
Data that Informs Progress on Each Goal/Objective	No data, quantitative or qualitative, is identified.	Data to inform progress are poorly suited to measure progress on goals/objectives.	Data to inform progress are generally well suited to measure progress on goals/objectives.	Data to inform progress are all well suited to measure progress on goals/objectives.
Assessment of Outcomes and Continuous Improvement	For goals/objectives in place the prior year, no reflection provided on achievements/challenges, sharing results, and/or plans for improvement or change based on results. No reflection on outcome assessment plan for continuous improvement provided for new goals/objectives.	For goals/objectives in place the prior year, modest at best reflection provided (and/or is vague or of questionable connection to results) on achievements/challenges, sharing results, and/or plans for improvement or change based on results. Modest at best reflection on assessment plan for continuous improvement provided for new goals/objectives.	For goals/objectives in place the prior year, generally appropriate reflection provided (and is reasonably well connected to results) on achievements/challenges, sharing results, and/or plans for improvement or change based on results. Reasonable reflection on assessment plan for continuous improvement provided for new goals/objectives.	For goals/objectives in place the prior year, strong reflection is provided in all cases (and is well connected to results) on achievements/challenges, sharing results, and/or plans for improvement or change based on results. Well-developed reflection on assessment plan for continuous improvement provided for new goals/objectives.
Overall Rating	<input type="checkbox"/> Undeveloped	<input type="checkbox"/> Developing	<input type="checkbox"/> Mature	<input type="checkbox"/> Exemplary