

4.0 STUDENT LEARNING OUTCOMES AND ASSESSMENT PLAN

Note: You are strongly encouraged to work with the University Assessment Coordinator as you develop this portion of the proposal. The University Assessment Coordinator can help you establish appropriate student learning outcomes, methods for measuring student progress and using the data to inform program improvement, and assist with all facets of academic assessment.

4.1 Student Learning Outcomes Assessment Plan

Complete the table below to provide an overview of your plan to assess student progress toward achievement of desired program-level learning outcomes. Note that results of evaluations of student performance against each learning outcome identified below will be reviewed as part of all college/school/center-level and University-level program reviews.

<p>Program-Level Student Learning Outcomes</p> <p><i>What are the most important (no more than five) specific learning outcomes you intend for all program completers to be able to <u>achieve and demonstrate</u> upon completion of the program?</i></p>	<p>Evaluation Method</p> <p><i>How will students document/demonstrate their performance toward achievement of the learning outcomes? How will you measure student performance toward achievement of the learning outcomes?</i></p> <p><i>Describe any use of <u>direct</u> measures: capstone experiences/courses, standardized exams, comprehensive exams, dissertations, licensure exams, locally developed exams, portfolio reviews, course-embedded assessments, etc.</i></p> <p><i>Describe any use of <u>indirect</u> measures: student, alumni or employer surveys (including satisfaction surveys); exit interviews/focus groups with grads; retention/transfer studies; graduation rates; job placement/grad school admission rates; etc.</i></p>	<p>Use of Assessment Data</p> <p><i>How and when will student performance data be analyzed and then used to “close the assessment loop” and inform <u>program improvement</u>? How will you document that?</i></p>
<p>1. Select the most appropriate choice among artificial intelligence methods for solving a given problem</p>	<p>Direct Measures: Students will demonstrate these abilities in the required CSCI 5740, CSCI 5750 courses and the AI Fundamental Elective. Artifacts from student projects and exams will be collected to measure this outcome.</p> <p>Indirect Measures: Exit interviews for all students will contain a self-assessment of their development for this outcome. Post-graduate surveys (one and three years out) will ask for a self-assessment of their continued development.</p>	<p>Assessment of Course-Level Outcomes will be performed annually by instructors. Evaluation of Program-Level Outcomes will be performed on a staggered three-year under the supervision of the Assessment Committee. Recommendations for curriculum, pedagogy and/or assessment revisions will be made to the department faculty on an annual cycle that allows for the appropriate implementation. Reviews of the impact of any such program changes will also be conducted annually, and the records of these reviews will be maintained by the program coordinator.</p>
<p>2. Design an experiment to evaluate the quality of a machine learning model and predict its accuracy in a solution environment</p>	<p>Direct Measures: Students will demonstrate these abilities in the required CSCI 5750 course and the AI Application Elective</p> <p>Indirect Measures: Exit interviews for all students will contain a self-assessment of their development for this outcome. Post-graduate surveys (one and three years out) will ask for a self-assessment of their continued development.</p>	<p>Assessment of Course-Level Outcomes will be performed annually by instructors. Evaluation of Program-Level Outcomes will be performed on a staggered three-year under the supervision of the Assessment Committee. Recommendations for curriculum, pedagogy and/or assessment revisions will be made to the department faculty on an annual cycle that allows for the appropriate implementation. Reviews of the impact of any such program changes will also be conducted annually, and the records</p>

		of these reviews will be maintained by the program coordinator.
3. Apply techniques from artificial intelligence to solve complex problems in an application domain	<p>Direct Measures: All students will be required to take an AI Application elective. Since students will fulfill this requirement in a variety of manners, we will assess this by asking each instructor to provide a representative application from their courses and have the assessment committee evaluate the outcome using a single rubric.</p> <p>Indirect Measures: Exit interviews for all students will contain a self-assessment of their development for this outcome. Post-graduate surveys (one and three years out) will ask for a self-assessment of their continued development.</p>	Assessment of Course-Level Outcomes will be performed annually by instructors. Evaluation of Program-Level Outcomes will be performed on a staggered three-year under the supervision of the Assessment Committee. Recommendations for curriculum, pedagogy and/or assessment revisions will be made to the department faculty on an annual cycle that allows for the appropriate implementation. Reviews of the impact of any such program changes will also be conducted annually, and the records of these reviews will be maintained by the program coordinator.
4. Design and implement a software solution that meets a given set of computing requirements	<p>Direct Measures: Students will demonstrate these abilities with projects within the required CSCI 5030 course and programming assignments in the required CSCI 5740 and CSCI 5750 course.</p> <p>Indirect Measures: Exit interviews for all students will contain a self-assessment of their development for this outcome. Post-graduate surveys (one and three years out) will ask for a self-assessment of their continued development.</p>	Assessment of Course-Level Outcomes will be performed annually by instructors. Evaluation of Program-Level Outcomes will be performed on a staggered three-year under the supervision of the Assessment Committee. Recommendations for curriculum, pedagogy and/or assessment revisions will be made to the department faculty on an annual cycle that allows for the appropriate implementation. Reviews of the impact of any such program changes will also be conducted annually, and the records of these reviews will be maintained by the program coordinator.
5. Make informed and ethical decisions regarding the impact of artificial intelligence technologies	<p>Direct Measures: This will be evaluated in CSCI 5050 which is required of all students. Each student's final paper will be evaluated by the instructor using a rubric developed by the assessment committee.</p> <p>Indirect Measures: Exit interviews for all students will contain a self-assessment of their development for this outcome. Post-graduate surveys (one and three years out) will ask for a self-assessment of their continued development.</p>	Assessment of Course-Level Outcomes will be performed annually by instructors. Evaluation of Program-Level Outcomes will be performed on a staggered three-year under the supervision of the Assessment Committee. Recommendations for curriculum, pedagogy and/or assessment revisions will be made to the department faculty on an annual cycle that allows for the appropriate implementation. Reviews of the impact of any such program changes will also be conducted annually, and the records of these reviews will be maintained by the program coordinator.
6. Assess literature and technical documents in the fields of artificial intelligence and machine learning	<p>Direct Measures: This will be evaluated in CSCI 5961, the capstone course. As part of their projects, students will need to review technical literature to consider options for solving the given problem. Students will be required to complete a written report on the options examined and conclusions they reach about the most appropriate choice.</p> <p>Indirect Measures: Exit interviews for all students will contain a self-assessment of their development for this outcome. Post-graduate surveys (one and three years out) will ask for a self-assessment of their continued development.</p>	Assessment of Course-Level Outcomes will be performed annually by instructors. Evaluation of Program-Level Outcomes will be performed on a staggered three-year under the supervision of the Assessment Committee. Recommendations for curriculum, pedagogy and/or assessment revisions will be made to the department faculty on an annual cycle that allows for the appropriate implementation. Reviews of the impact of any such program changes will also be conducted annually, and the records of these reviews will be maintained by the program coordinator.

<p>7. Effectively communicate methods and results to both professional and general audiences in both oral and written form</p>	<p>Direct Measures: This will be evaluated in both CSCI 5050 (requiring both an oral presentation and a written final paper) and CSCI 5961 (requiring two presentations, and some form of written technical deliverable).</p> <p>Indirect Measures: Exit interviews for all students will contain a self-assessment of their development for this outcome. Post-graduate surveys (one and three years out) will ask for a self-assessment of their continued development.</p>	<p>Assessment of Course-Level Outcomes will be performed annually by instructors. Evaluation of Program-Level Outcomes will be performed on a staggered three-year under the supervision of the Assessment Committee. Recommendations for curriculum, pedagogy and/or assessment revisions will be made to the department faculty on an annual cycle that allows for the appropriate implementation. Reviews of the impact of any such program changes will also be conducted annually, and the records of these reviews will be maintained by the program coordinator.</p>
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4.2 Curriculum Mapping

Courses should contribute to student achievement of the program learning outcomes detailed above. Sequencing should be intentional and complementary, allowing for the development of curricular content at multiple levels and the application and demonstration of student understanding and skills at multiple levels. Accordingly, complete the two curriculum maps below, indicating the course(s) in which each learning outcome is intentionally addressed and at particular levels of intellectual complexity and rigor, using the level indicators* provided below. ***Depending on the nature of the proposed program, the levels may seem more or less appropriate. Without veering from the spirit of the exercise, you may adapt the levels as deemed appropriate.***

Level I	Level II	Level III
<ul style="list-style-type: none"> ▪ <i>Knowledge & Comprehension:</i> Recall data or information; understand the meaning, translation, interpolations, and interpretation of instructions and problems; state a problem in one's own words. 	<ul style="list-style-type: none"> ▪ <i>Application:</i> Use a concept in new situations; unprompted use of an abstraction. Application of knowledge in novel situations. ▪ <i>Analysis:</i> Separates material or concepts into component parts so organizational structure may be understood. Distinguishes facts from inferences. 	<ul style="list-style-type: none"> ▪ <i>Synthesis:</i> Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure. ▪ <i>Evaluation:</i> Make judgments about the value of ideas or materials.

Note: When you first complete the curriculum maps, you may see that certain outcomes are not addressed in any developmentally-appropriate sequence, or that a particular outcome might not be addressed substantially enough; you might even see that you have included a course(s) in your curriculum that doesn't substantially contribute to the development of any outcome. You should use the map to alter your program design, course syllabi and course sequencing to best facilitate and support student achievement of the outcomes. The result of that exercise should be a final curriculum map presented below when you submit your proposal to UAAC.

Courses Offered by Home Department of Proposed Major or Minor:

Major or Minor Student Learning Outcomes	CSCI 5030	CSCI 5050	CSCI 5740	CSCI 5750	CSCI 5961	AI Foundations Electives	AI Applications Electives
<i>Example: Outcome #1</i>	1	1	1, 2	2	2	2	
<i>Outcome #1</i>			1, 2	1, 2		2	2
<i>Outcome #2</i>				1, 2			2
<i>Outcome #3</i>							1, 2, 3
<i>Outcome #4</i>	1, 2, 3						
<i>Outcome #5</i>		1, 2, 3					
<i>Outcome #6</i>			1	1	2		
<i>Outcome #7</i>	2	2			2, 3		

Program Courses Offered by Other Departments:

Major or Minor Student Learning Outcomes						All Foundations Electives	All Applications Electives
<i>Example: Outcome #1</i>	1	2	1		2, 3		
<i>Outcome #1</i>						2	2
<i>Outcome #2</i>							2
<i>Outcome #3</i>							1, 2, 3

* Adapted from Bloom's Taxonomy (1965)