

# **Part I: Assessment Plan**

College of Liberal Arts & Sciences

Department of Computer Science

Doctoral Program

Ph.D. in Computer Science

February 10, 2022

Submitted to the University Assessment Panel by:

Nicholas Karonis, Chair

## **1. Introduction**

The doctoral program in Computer Science prepares students to function effectively as scholars and researchers within academic and non-academic settings; maintain the competitive advantage in attracting well-qualified applicants in graduate computer science programs at NIU; and provide the advanced level of training needed to address the university's mission of expanding and applying knowledge.

The doctoral program contributes to the growing need for computer science professionals who are skilled in solving problems with modern computing techniques in Illinois and beyond. Such jobs include academia and industry positions requiring advanced technical expertise and research opportunities in national laboratories. Our doctoral program is well-positioned to meet its goals by leveraging our ties with the US Department of Energy's Argonne National Laboratory and Fermi National Accelerator Laboratory and the long-established relationships with industry partners where students routinely complete internships.

Assessing the program's success focuses in equal parts on the students' achievements while progressing through the program and their evaluated competency after graduation.

## **2. Student Learning Outcomes (SLOs)**

Upon completion of the program, students will be able to:

1. Establish proficiency in developing research level computer models and tools;
2. Evaluate fundamental and recent scientific work in a major field of specialization as well as other advanced topics;
3. Create scientific knowledge that advances their field of specialization;
4. Disseminate their scientific knowledge to the scientific community (e.g. through presentations and manuscripts) as well as lay-audiences;
5. Analyze scholarly work in computer science and provide critical feedback to revise it, within both intra- and inter-professional teams.

#### 4. Curriculum Map

Course	Program Student Learning Outcomes				
	1. SLO1	2. SLO2	3. SLO3	4. SLO4	5. SLO5
Programming Principles CSCI 501, 502, 503, 504, 505	B			B	
Computer Systems CSCI 511, 512, 513, 514, 515	B,D			B,D	
Mobile Device Programming Principles CSCI 521, 522	D				
Advanced Mobile Device Programming CSCI 523, 524	P			P	
Software Design CSCI 526	B,D	B,D	B,D	B,D	B,D
Web Design CSCI 528	B,D	B		B,D,P	B,D,P
Big Ideas in Computer Science CSCI 600	B	B	B	B	B
Computer Science Theory CSCI 601, 602	D	D			
Cybersecurity CSCI 607, 608, 609, 610	P	P		P	
Computer Network Applications CSCI 612	P	P		D	
Game Development CSCI 614	D	D	D	D	
Topics in Specialized Areas CSCI 626, 627, 630, 631, 633, 636, 639, 641, 642, 646, 651, 652, 656, 657, 661, 662	D	D	D	D	D
Advanced Topics in Specialized Areas CSCI 628, 629, 632, 634, 635, 637, 647, 653, 658, 659	P	P	P	P	P

Course	Program Student Learning Outcomes				
	1. SLO1	2. SLO2	3. SLO3	4. SLO4	5. SLO5
Topics in Computer Science CSCI 680	B,D,P	B,D,P	B,D,P	B,D,P	B,D,P
Internships CSCI 690, 696	P				
Seminar in Computer Science CSCI 695	D	D			
Graduate Readings in Computer Science CSCI 697	D	D	D	D	D
Master's Thesis CSCI 699	D	D	D	D	D
Research Methods in Computer Science CSCI 701		P	P	P	P
Doctoral Research and Dissertation CSCI 799	P	P	P	P	P
<i>Note.</i> Course supports the outcome at the B=beginning, D=developing, or P=proficient level.					

## 5. Assessment Methods

*Explanation of Assessment Methods Table*

Assessment Method	Explanation					
	Description	Student-Level Achievement <sup>a</sup>	Program-Level Target <sup>b</sup>	When Data Will be Collected	Person Responsible	SLOs
Post-Degree Feedback: Employers	Survey results and feedback from stakeholders (employers and related professionals) regarding how well the graduates have performed after completion of the program.	A student will receive an average score of Satisfactory (3) or better from the entire survey.	At least 85% of responses will indicate an average score of Satisfactory (3) or better from all surveys.	Bi-annually. At or near the completion of both the Fall and Spring semester.	Assistant to the Chair.	1, 2, 3, 4, 5
Post-Degree Feedback: Students	Survey results and feedback from stakeholders (recent program Alumni) regarding how well they felt the program prepared them for employment, as well as how impactful the program's success was with meeting their academic goals.		At least 85% of responses will indicate an average score of Satisfactory (3) or better from all surveys.	Bi-annually. At or near the completion of both the Fall and Spring semester.	Assistant to the Chair.	1, 2, 3,4, 5
Presentation or Publication of Scholarly Projects by Students	A quantitative record of the number presentations or publications of scholarly work in which the student played a key role.	A student will have their dissertation work published for peer-review by the scientific community.	At least 30% of students will have authored or coauthored peer-reviewed publications.	Annually, at the completion of the Spring term.	Dissertation Committee Chair.	1, 2, 3, 4, 5
Master's Thesis Defense	Students will work with their dissertation advisor to write and defend a Master's Thesis based on student work done in the advisor's area of research.	A student will successfully defend his/her Master's Thesis.	At least 60% of the students will successfully defend their Master's Thesis.	Annually, at the completion of the Spring term.	Director of Graduate Studies.	1, 2, 3, 4, 5

Assessment Method	Explanation					
	Description	Student-Level Achievement <sup>a</sup>	Program-Level Target <sup>b</sup>	When Data Will be Collected	Person Responsible	SLOs
Dissertation Proposal Defense	Students will work with their dissertation advisor to write and defend a dissertation proposal.	A student will successfully defend his/her dissertation proposal.	At least 30% of the students will successfully defend their dissertation proposal.	Annually, at the completion of the Spring term.	Director of Graduate Studies	1, 2, 3, 4, 5
Dissertation Defense	Students will write and defend their doctoral dissertation.	A student will successfully defend his/her dissertation.	At least 85% of the students will successfully defend their dissertation.	Annually, at the completion of the Spring term.	Director of Graduate Studies	1, 2, 3, 4, 5
Student Success in Program	An examination of the retention, graduation, and time-to-degree completion rates.		<ul style="list-style-type: none"> <li>At least 85% of admitted students are retained.</li> <li>The goal for degree completion is no more than seven years.</li> </ul>	Annually, at the completion of the Spring term.	Assistant to the Chair.	1, 2, 3

**ASSESSMENT METHODS-BY-OUTCOMES MATRIX**

Assessment Method	Program Student Learning Outcome				
	1. SLO 1	2. SLO 2	3. SLO 3	4. SLO 4	5. SLO 5
Post-Degree Feedback: Employers	S, I	S, I	S, I	S, I	S, I
Post-Degree Feedback: Students	S, I	S, I	S, I	S, I	S, I
Presentation or Publication of Scholarly Projects by Students	S, D	S, D	S, D	S, D	S, D
Master's Thesis Defense	F, D	F, D	F, D	F, D	F, D
Dissertation Proposal Defense	F, D	F, D	F, D	F, D	F, D
Dissertation Defense	S, D	S, D	S, D	S, D	S, D
Student Success in Program	F, D	F, D	F, D		
<i>Note.</i> F=formative assessment, S=summative assessment, D=direct assessment, and I=indirect assessment.					