

Department of Computer Science
College of Science and Mathematics

I. Mission Statement

The mission of the Department of Computer Science is to provide programs giving students both the breadth and depth of knowledge and experience in computer science they need for their professional or academic careers; to offer valuable service and General-Education courses bringing the ideas and methods of computer science to non-majors; to create service-learning opportunities for regional engagement by encouraging student projects that are valuable to local non-profits and businesses; and to prepare a quality workforce.

The general learning goals for students are *knowledge*, to understand computation in both its abstract forms and physical realizations; *skills*, to implement computational models effectively in software; and *values*, to appreciate the roles and responsibilities of computer science professionals in the world.

II. Goals and Student Learning outcomes

Graduates with an MS degree from the Department of Computer Science are expected to achieve the following goals (lettered main items) and student learning outcomes (numbered sub-items):

- A. Mathematical background as a foundation for Computer Science
 - 1. Student will understand propositional and predicate logic, set theory, probability, graph theory, and linear algebra.
- B. Knowledge of algorithms
 - 1. Students will understand algorithms, algorithm design, recursion, and data structures
 - 2. Students will be able to analyze the effects of choice of algorithm on correctness and performance
- C. Knowledge of formal methods of computation
 - 1. Students will understand finite automata and concurrency
- D. Knowledge of physical realizations
 - 1. Students will understand von Neumann architecture, processor models, computer organization, memory management, and models of dynamic storage
 - 2. Students will understand the interaction of hardware and software and the impact of specific hardware choices and specifications

E. Problem solving skills and the ability to apply them to research problems

1. Students will be able to work independently to research a problem, formulate solutions, and choose the best one

F. Software development skills, including software design, testing, debugging, documentation, implementation of data structures, implementation of dynamic storage mechanisms, performance analysis, and program correctness

1. Students will be able to analyze, design, implement, debug, and test software to meet specified requirements
2. Students will be able to work effectively in a variety of programming environments (hardware, software, operating systems)
3. Students will be competent in the tools used in software practice
4. Students will be able to communicate effectively and to work in teams

G. Programming language skills

1. Students will be fluent in a high-level language and an assembly language, and with regular expressions and formal languages
2. Students will be familiar with different programming language paradigms (logic, functional), scope and binding rules, and the concepts, applications, and implementations of languages

H. Knowledge of operating systems

1. Students will understand operating system history and services, file systems, memory management, process management, resource management, and security and protection mechanisms

I. Communication and documentation skills for the purpose of conveying Computer Science information to professional scientists

1. Students will gain the ability to communicate with Computer Science professionals, present technical findings, and write satisfactory technical reports and papers

J. Knowledge of professional ethics and the social and global impact of computer science

1. Students will demonstrate professional and ethical responsibility
2. Students will understand the organizational, social, and global impact of computational solutions

CSci 274		R	R								
CSci 282				R							
CSci 284				R							
CSci 290							E				
CSci 298							R				
CSci 299							R				

	G.1	G.2	H.1	I.1	J.1	J.2
CSci 40*	I	I				I
CSci 41*	I	I				I
CSci 112*	I					
CSci 113*	E					
CSci 115*	E					
CSci 117*	E	E				
CSci 119*						
CSci 144*			I			
CSci 174 ⁺						
CSci 188 ⁺						
CSci 200+				I	I	E
CSci 213+	R					
CSci 217+	R	R				
CSci 226						
CSci 230	E					
CSci 244			E			
CSci 250	R					
CSci 252	R					
CSci 253				R	R	R

Csci 272						
Csci 274						
Csci 282						
Csci 284						
Csci 290						R
Csci 298				E		R
Csci 299				R		R

IV. Assessment Methods

A. Direct Measures

The department conducts the following direct assessments of student learning:

A.1 and A.2 are pre- and post-tests of core Computer Science knowledge. Since the questions on the Major Field Test (MFT) are retired questions from the Computer Science subject exam, the results are comparable, and the delta will tell us the value added by the core curriculum.

1. Major Field Test. As a measure of students’ understanding of fundamental computer science at the beginning of the program, the computer science MFT will be administered to all incoming students. Results will be disseminated to the graduate faculty members at the beginning of the next academic year.
2. Computer Science subject exam. As a measure of students’ understanding of fundamental computer science prior to graduation, the department requires students to take the computer science subject exam the same semester as enrollment in the culminating graduate experience (CSci 298, 299). Results will be disseminated to the graduate faculty members at the beginning of the next academic year.

A.3 is a measure graduate students’ research activity.

3. List of student-involved research activities. Faculty will provides lists of research projects and publications involving students to the department office at the end of each academic year.

A.4 measures the culminating experience by rating the report and presentation against a best-practices rubric.

4. Faculty members will use a rubric to assess MS project presentations and reports.

B. Indirect measures

1. Every four years the department will survey alumni. The results will be disseminated to the graduate faculty.
2. Every four years the department will survey academic and industry employers of alumni. The results will be disseminated to the graduate faculty.

V. Student Learning Outcomes x Assessment Methods Matrix

	A. 1	B. 1	B. 2	C. 1	D. 1	D. 2	E. 1	F. 1	F. 2	F. 3	F. 4	G. 1	G. 2	H. 1	I. 1	J. 1	J. 2
4.A.1	2	3	2	3	3	3		1				1	1	3	2	1	1
4.A.2	2	3	2	3	3	3		1				1	1	3	2	1	1
4.A.3							3	3	2	2	2						
4.A.4							3								3	3	1
4.B.1		1	1					1	1	1	1	1	1		3	2	2
4.B.2		1	1					1	1	1	1	1	1		3	2	2

3 = strong;

2 = moderate;

1= possible

VI. Timeline for implementation of assessment methods and summary evaluations

- A.1 MFT begins with the incoming Fall 2011 students.
 A.2 Computer Science subject exams begin with students enrolling in the culminating experience in Spring 2012
 A.3 Projects and publications list begins in 2010-11 academic year
 A.4 Project report and presentation rubrics begin in the spring 2011 semester
- B.1 Alumni survey begins in the 2011-2012 academic year and is repeated every four years.
 B.2 Employer survey begins in the 2012-2013 academic year and is repeated every four years.

VII. Closing the loop

The department will meet for an assessment retreat during faculty duty days before fall semester instruction starts. Adjustments to curriculum and measures will be initiated at that meeting.

Results will be posted as they become available on a departmental web site or Blackboard organization accessible only by faculty.

**Computer Science
Graduate Project/Thesis Assessment Form**

Student name:

Date of presentation:

Thesis or Project?

On a scale of 1 (unacceptable) to 5 (good) rate the following and provide a brief comment.

Presentation

Oral communication:

Clarity of slides or visuals:

Effectiveness of demonstration:

Response to questions:

Technical content

Description of goal, problem, or hypothesis:

Clarity of methodology:

Significance of results:

Suitability of work for MS level CSci:

Written report or thesis

Organization:

Writing, spelling, and grammar:

Clarity of presentation:

Documentation of results:

Significance of conclusion:

References and bibliography:

Evaluator: