KBOR DETAILED ASSESSMENT OF STUDENT LEARNING REPORT

I. Introduction

A) College, Department, and date.

College: Engineering
Department: Computing and Information Sciences
Date: April 3, 2009

B) Person(s) responsible for preparing the report.

Gurdip Singh

II. Overview of Assessment

A) Summary of the Department's/Program's ORIGINAL approved Assessment Plan, including a list of the original approved Student Learning Outcomes (SLOs) (Include a copy of the original Assessment Plan in *Appendix A*)

The original assessment plan involved evaluating the students against the following Student learning Outcomes:

(1) Ability to use software engineering techniques,
(2) Ability to apply theoretical math, science, and computational skills to solve advanced scientific and/or engineering principles.
(3) Ability to communicate effectively both in written and oral forms.

The supervisory committee of each graduate student was responsible for assessing the students. Data with respect to direct and indirect measures are collected by the committee members during the period of study of the student and during the final presentation. A form was given to each member of the committee at the time of final oral exam to perform the evaluation.

B) Summary of modifications made to the Assessment Plan during the previous four years.

From the data obtained from the assessment, some international students were assessed as "not acceptable" with respect to the learning outcome "Ability to communicate effectively both in written and oral forms". To obtain better feedback, the assessment form was modified to obtain further feedback from whether oral or written or both forms of communication skills were unacceptable.

Advising forms were introduced for students to fill out in conjunction with their advisors at the end of each semester. These forms enable the student progress to be monitored more closely.

The preliminary examination structure was changed to contain two separate parts: Breadth Requirement and Research Proficiency exam. The Breadth Requirement is meant the judge the breadth of knowledge in various fundamental areas of computer science. This requirement for each area can be satisfied by either passing an exam or obtaining an appropriate grade in a course. The Research Proficiency exam is meant to evaluate the capability of the student to survey and conduct research. This exam contains a sequence of three presentations with feedback provided to the student after each presentation.

C) List of the current SLOs for the Department/Program

    1.   Ability to use software Engineering Techniques,
    2.   Ability to apply theoretical math, science, and computational skills to solve advanced scientific and/or engineering principles.
    3.   Ability to communicate effectively both in written and oral forms.

D) Program Assessment Alignment Matrix (include a copy in *Appendix B*)

Program Correlation Matrix

Program SLOs	University-wide SLOs (Graduate Programs)			Program SLO is conceptually different from university SLOs
	Knowledge	Skills	Attitudes and Professional Conduct	
1. Ability to use software engineering techniques	X	X		
2. Ability to apply theoretical skills	X	X		
3. Communication		X		

Program Alignment Matrix

SLO/ Required courses/ Experiences	CIS690 CIS736	CIS720 CIS721 CIS722 CIS725 CIS726	CIS740 CIS761 CIS771 CIS841	CIS705 CIS706 CIS806	CIS770 CIS775	Breadth Exams	Research Proficiency exam	Thesis proposal	Thesis documentation	Thesis defense
Program SLOs										
Ability to use software engineering techniques	X		X			X				
Ability to apply theoretical skills		X	X	X	X	X	X	X		X
Communication							X	X	X	X
University SLOs										
Knowledge	X	X	X	X	X	X	X	X		
Skills	X	X	X	X	X	X	X	X	X	X
Attitudes and Professional conduct										

E) List the website where the Program SLOs, Assessment summary, and Alignment Matrix for each degree program are located (within two clicks of the Department/Program front page).

http://www.cis.ksu.edu/programs/objectives

III. Assessment Strategies

For each SLO, please describe:

A) The measures used (approximately one-half of the measures used are to be direct measures, and at least one direct measure must be used for each student learning outcome) :

The following measures were used for each SLO.

SLO 1: Ability *to use software engineering techniques*

Direct measure:

    i.   Software architecture design, coding and testing.

    ii.   Formal specification of software systems

Indirect measure:

    i.   Interactions with the supervisory committee.

   ii.   Timely completion of the thesis

SLO 2: *Ability to apply theoretical math, science, and computational skills to solve advanced scientific and/or engineering principles.*

  Direct measure:

    i.   Formulation of the problem addressed in the Phd thesis.

   ii.   Software architecture design, coding and testing

  iii.   Analysis of the proposed solution.

  iv.   Research Proficiency exam

   v.   Breadth exams

  Indirect measure:

    i.   Interactions with the supervisory committee

SLO 3: *Ability to communicate effectively both in written and oral forms.*
  Direct measure:

    i.   Software and project documentation

   ii.   Project presentation.

  Indirect measure:

    i.   Interaction with the supervisory committee

B) The timetable for the assessment strategies

A student in the PhD program typically chooses the major professor and the supervisory committee in the second semester. The student must complete the Breadth requirement within the first three semesters. The Research Proficiency exam is done in the semester following the completion of the Breadth Requirement. During this period, the learning outcomes are assessed by the supervisory committee based on the interactions with the student, breadth requirement exams and the research proficiency presentations. The presentation made by the student at the end of the final semester is an important part of the assessment plan.

C) A description of the method(s) in which the measures were administered.

At each final oral exam in the CIS department, the CIS graduate program outcome evaluation sheet is given to each member of the student's supervisory committee. The forms are returned to the Graduate Study secretary. The results from these forms are tabulated and analyzed. The results are then reported to the CIS faculty.

IV. **Assessment Results**

Describe the results of the assessment strategies, including, but not limited to:

A) The specific quantitative and qualitative data collected during the review cycle

The evaluation form required the supervisory committee members to rate each student on a scale from 1 to 5 on a set of six questions. In case the communication skills were judged to be unacceptable, the evaluator had to indicate whether oral or written skills were an issue.

B) The sample of students from whom data were collected during review cycle

The data was collected for all students who graduated during this period.

C) Other results or outcomes from the assessment strategies.

The data from the evaluation forms had acceptable or higher rating for all of the PhD students in each of the categories.

V. **Review of the Assessment Results**

A) Describe the process by which program faculty reviewed the results and decided on the actions and/or revisions that were indicated by those results.

The results obtained from the evaluation forms are reviewed by the Graduate Studies Committee and distributed to the CIS faculty, and compared with the previous results. The faculty discusses these results in a faculty meeting. Changes to the curriculum and/or changes to the expectations for graduate performance are discussed, documented and implemented.

VI. **Actions and Revisions Implemented**

A) Describe the actions and/or revisions that were implemented in response to the assessment results and review of the results by faculty.

The preliminary examination was changed to assess both the breadth of knowledge and ability to conduct research. In the previous version of preliminary exams, the students had to select a set of subject areas and were tested for in-depth knowledge in those areas. This was changed to allow testing for breadth of knowledge in all basic areas of computer science (rather than selected areas). It was also decided to test knowledge that a student would acquire by taking an undergraduate course in that area. The Research Proficiency exam was introduced to further test the ability of a student to survey and conduct research. The student was assigned an area which the student must survey and identify open problems. The committee would then assign a specific problem for which the student must propose potential solutions.

VII. **Effects on Student Learning and Future Plans**

A) Describe the effects on student learning of the actions and/or revisions that occurred during the review cycle.

Following the change in the preliminary examination structure, we have seen more students taking the preliminary examination and passing it. Students currently enrolled in the MS program and planning to do a PhD are able to better plan their courses in order to address the Breadth requirement. It has also resulted in an increase in the number of PhD students graduating.

B) Describe the plans for the next ASL cycle. All changes to the ASL plan should be clearly justified relative to assessment results, data, and actions described in this report.

One of the missing pieces of data is direct feedback from the students with respect to the student learning outcomes. We plan to design forms and collect this feedback data to further improve the assessment process. We also need to further evaluate the impact of the changes to the Preliminary examination structure on the student preparation and graduation and retention rates. The new structure has been in effect for less than two years; hence, data over a longer period is needed.

CIS Graduate Degree Program
Assessment of Student Learning Plan
Kansas State University

☐   Check the box if your program's student learning outcomes have been modified since November 2003. If so, please email (apr@ksu.edu) or attach a hard copy to this document.

A. College, Department, and Date

College: *Engineering*
Department: *Computing and Information Sciences*
Date: *10/29/2004*

B. Contact Person(s) for the Assessment Plans
David A Gustafson, Graduate Program Director

C. Degree Program
MS in Computer Science
Masters in Software Engineering
PhD in Computer Science

D. Assessment of Student Learning Three-Year Plan

1. Student Learning Outcome(s)

    1. ability to use software engineering techniques to design and implement significant software systems.
    2. ability to apply theoretical math, science, and computational skills to solve advanced scientific and/or engineering problems.
    6. ability to communicate effectively both in written and oral forms

Relationship to K-State Student Learning Outcomes (insert the program SLOs and check all that apply):

Program SLOs	University-wide SLOs (Graduate Programs)			Program SLO is conceptually different from university SLOs
	Knowledge	Skills	Attitudes and Professional Conduct	
1. ability to use software engineering techniques	X	X		
2. ability to apply theoretical skills	X	X		
6. communication		X		

2. **How will the learning outcomes be assessed? What groups will be included in the assessment?**

> At each final oral exam in the CIS department, the CIS graduate program evaluation sheet will be filled out by the major professor and each committee member. The forms will be returned that day to the graduate study secretary. At the end of each semester, the Graduate Study committee will analyze the data from the forms. At a minimum, average and standard deviation of the scores will be calculated.
>
> Each professor will be confidentially informed of the scores of his/her students. This information will not be included in the official results.

3. **When will these outcomes be assessed? When and in what format will the results of the assessment be discussed?**

4.

> At each final oral exam. See above.

5. **What is the unit's process for using assessment results to improve student learning?**
   These numbers will be distributed to the CIS faculty and compared with previous results. The faculty will discuss the results at a faculty meeting at the beginning of each semester. Changes to the curriculum and/or changes to the expectations for graduate performance will be discussed, documented, and implemented.

Appendix B: Assessment Alignment Matrix

SLO/ Required courses/ Experiences	CIS690 CIS736	CIS720 CIS721 CIS722 CIS725 CIS726	CIS740 CIS761 CIS771 CIS841	CIS705 CIS706 CIS806	CIS770 CIS775	Breadth Exams	Research Proficiency exam	Thesis proposal	Thesis documentation	Thesis defense
Program SLOs										
Ability to use software engineering techniques	X		X			X				
Ability to apply theoretical skills		X	X	X	X	X	X	X		X
Communication							X	X	X	X
University SLOs										
Knowledge	X	X	X	X	X	X	X	X		
Skills	X	X	X	X	X	X	X	X	X	X
Attitudes and Professional conduct										

Program Correlation Matrix

	University-wide SLOs (Graduate Programs)			Program SLO is conceptually different from university SLOs
Program SLOs	Knowledge	Skills	Attitudes and Professional Conduct	
1. Ability to use software engineering techniques	X	X		
2. Ability to apply theoretical skills	X	X		
3. Communication		X		

CIS Graduate Program Outcomes Checklist

To be filled out by each committee member for each MS/MSE/Ph.D. oral exam. This form is not to be considered an evaluation of the student. It is intended as part of the evaluation of the CIS graduate program. The results will not be shown to the student. The answer of N/A for not applicable is acceptable.

Student Name:

Date, Time and Place of Oral Exam:

Committee Members:

Program option: MS report   MS Thesis   MS Non-thesis/report   MSE   Ph.D.

Please rank each of the outcomes between 1 and 5 where 1 is unacceptable, 2 is marginally unacceptable, 3 is acceptable, 4 is above acceptable, and 5 is excellent.

Outcomes	Score

1. Ability to use software engineering techniques to design and implement significant software systems. ____

2. Ability to apply theoretical math, science, and computational skills to solve advanced scientific and/or engineering problems. ____

3. (MS and MSE) Demonstrate advanced knowledge in the area of specialization. **or** (PH.D) Demonstrate advanced expertise in multiple subject areas and a deeper understanding of the frontiers in a specialized research area. ____

4. (MS nonthesis/report) Ability to plan and conduct scholarly activities. **or** (MS report) Ability to plan and conduct scholarly activities and to analyze and synthesize the current literature and methodology. **or** (MS thesis) Ability to plan and conduct original scholarly activities, to analyze and synthesize the current literature, and to make an original contribution to the field. **or** (MSE) Ability to plan, conduct, and apply scholarly activities resulting in a substantial implementation. **or** (Ph.D.) Ability to plan and conduct original scholarly activities, to analyze and synthesize the current literature, and to make a significant original contribution to the field and extend the frontiers of a focused research area. ____

5. Effectiveness in leadership, collaboration, and professional service. ____

6. Ability to communicate effectively in both written and oral forms. If below a 4 rating, please circle written or oral or both to indicate the problem area. ____
   Oral   Written   Both

Name of committee member filling out form:

Did you serve as the Major Professor for this student?   Yes   No