## Attachment 1. Rubric for ITCS 6162 Project

<table>
<thead>
<tr>
<th></th>
<th><strong>Beginning</strong> 1</th>
<th><strong>Needs Improvement</strong> 2</th>
<th><strong>Acceptable</strong> 3</th>
<th><strong>Accomplished</strong> 4</th>
<th><strong>Exemplary</strong> 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understands the Problem and Requirements</td>
<td>Student’s work shows incomplete understanding of problem and/or requirements</td>
<td>Student’s work shows slight understanding of problem and requirements</td>
<td>Student’s work shows understanding of problem and most requirements</td>
<td>Student’s work shows complete understanding of problem and all requirements</td>
<td>Student recognizes potential conflicts b/t requirements and seeks clarification from client/user</td>
</tr>
<tr>
<td>Uses Appropriate Data Structures</td>
<td>No use of ADTs (aggregate data types/structures)</td>
<td>Use of ADTs; but are none are appropriate for task</td>
<td>Use of ADTs; but some are not most appropriate for task</td>
<td>Use of ADTs; all are appropriate for task</td>
<td>Uses advanced ADTs that improves program performance</td>
</tr>
<tr>
<td>Uses Appropriate Algorithms</td>
<td>Student ‘hacks out’ program with no thought to algorithm design</td>
<td>Student chooses/designs algorithm(s) that are incorrect</td>
<td>Student chooses/designs algorithm(s) that is/are correct but somewhat inefficient</td>
<td>Student chooses/designs efficient algorithm(s)</td>
<td>Student researches tradeoffs b/t different algorithms &amp; implements the results of this research</td>
</tr>
<tr>
<td>Designs Appropriate User Interface</td>
<td>Implements very poor I/O functionality</td>
<td>Only implements basic I/O functionality</td>
<td>Some concepts of ‘user-friendly’ I/O used (e.g. prompts on input &amp; labels on output)</td>
<td>Uses well-designed ‘user-friendly’ I/O interface appropriate for task and client</td>
<td>‘User-friendly’ I/O interface with GUI components</td>
</tr>
<tr>
<td>Tests Program for Correctness</td>
<td>No evidence of any testing by student</td>
<td>Evidence of only one case tested</td>
<td>Evidence of a few cases tested</td>
<td>Evidence of ‘typical cases tested, but only assuming valid inputs</td>
<td>‘Robust design’ with extensive testing.</td>
</tr>
<tr>
<td>Documents Program</td>
<td>Absolutely no documentation other than name.</td>
<td>Little or no documentation; few or no internal comments</td>
<td>Some documentation, but sparse internal comments</td>
<td>Complete documentation with numerous internal comments</td>
<td>Thorough documentation; Use of javadoc or similar docs generator software</td>
</tr>
</tbody>
</table>

ITCS 6162 project will be graded on the 1-5 scale according to the average score of the rubric. If the average score of the 6 items on the rubric is below 3, the student has to rewrite and resubmit the project.
Attachment 2. Rubric for ITCS 6162 Study Report

<table>
<thead>
<tr>
<th></th>
<th>Poor 1</th>
<th>Needs Improvement 2</th>
<th>Acceptable 3</th>
<th>Good 4</th>
<th>Excellent 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity with Terminology</td>
<td>Demonstrates only minimal understanding of basic terminology in the area</td>
<td>Demonstrates understanding of some basic terminology in the area</td>
<td>Demonstrates understanding of most of the basic terminology in the area</td>
<td>Demonstrates understanding of most of the terminology in the area</td>
<td>Demonstrates thorough understanding of all relevant terminology in the area</td>
</tr>
<tr>
<td>Depth of Concepts</td>
<td>Demonstrates only minimal understanding of the core concepts</td>
<td>Demonstrates some understanding of the core concepts</td>
<td>Demonstrates understanding of most of the core concepts and some advanced concepts</td>
<td>Demonstrates understanding of all core and most advanced concepts in the area</td>
<td>Demonstrates thorough understanding of core and advanced concepts in the area</td>
</tr>
<tr>
<td>Up-to-date Knowledge</td>
<td>Knowledge shown in the study report is incorrect or outdated</td>
<td>Knowledge shown in the study report is correct but somewhat outdated</td>
<td>Knowledge shown in the study report is correct and up-to-date</td>
<td>Knowledge shown in the study report is up-to-date and thorough</td>
<td>Knowledge shown in the study report is thorough, profound, and of the state-of-the-arts</td>
</tr>
<tr>
<td>Literature and References</td>
<td>No references or references cited are somewhat inappropriate for subject</td>
<td>References cited are appropriate but somewhat limited; or citations are incomplete</td>
<td>Sufficient number of references for depth / complexity of report; citations are adequate</td>
<td>Near complete list of references for subject of report; citations are near complete</td>
<td>Thorough list of references with complete citations and annotations</td>
</tr>
</tbody>
</table>

The study report will be graded on the 1-5 scale according to the average score of the rubric. If the average score of the 4 items on the rubric is below 3, the student has to rewrite and resubmit the study report.
Steps in Constructing an Analytic Scoring Rubric

1. List evaluation criteria down the left side of the rubric template.
2. Determine what kind of rubric scale to use (e.g., 1-3, 1-5).
3. Label each level of proficiency across the top of the rubric (e.g.,“(1) Needs Improvement,” “(2) Acceptable,” “(3) Accomplished”).
4. Write cell descriptions of what the highest level of proficiency “(3) Accomplished” looks like for the criterion.
5. Write cell descriptions of what the lowest level of proficiency “(1) Needs Improvement” looks like for the criterion.
6. Write cell descriptions of what the mid-levels of proficiency look like for each criterion.
7. Test it: use the rubric to evaluate student artifacts. Make note of important evaluation criteria that were omitted, existing criteria to eliminate, and cell descriptions that require revision.
8. Revise the rubric and continue revising it as needed.
Spring 2013 and Fall 2013
Student Learning Outcomes Assessment Plan and Report

(Document student learning outcomes assessment plans and assessment data for each undergraduate and graduate degree program and certificate program, stand alone minor, and distance education program offered online only.)

College:  Computing and Informatics
Department:  Computer Science
Name of Degree or Certificate Program/Stand Alone Minor/Online Distance Education Program:  Graduate Certificate in Advanced Databases and Knowledge Discovery (ADKD)

Reflection on the Continuous Improvement of Student Learning
1. List the changes and improvements your program planned to implement as a result of last year’s student learning outcomes assessment data.
2. Were all of the changes implemented?  If not, please explain.
3. What impact did the changes have on student learning?

No changes

<table>
<thead>
<tr>
<th>Student Learning Outcome 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(knowledge, skill or ability to be assessed)</td>
</tr>
<tr>
<td>Students will demonstrate competency in knowledge discovery, algorithms and methods.</td>
</tr>
</tbody>
</table>

Changes to the Student Learning Outcomes Assessment Plan:  If any changes were made to the assessment plan (which includes the Student Learning Outcome, Effectiveness Measure, Methodology and Performance Outcome) for this student learning outcome since your last report was submitted, briefly summarize the changes made and the rationale for the changes.

No changes made
Effectiveness Measure: Identify the data collection instrument, e.g., exam, project, paper, etc. that will be used to gauge acquisition of this student learning outcome and explain how it assesses the desired knowledge, skill or ability. A copy of the data collection instrument and any scoring rubrics associated with this student learning outcome are to be submitted electronically to the designated folder on the designated shared drive.

A substantial final project in ITCS 6162 Knowledge Discovery in Databases, which requires students to understand the problem and the requirements, use appropriate data structures and algorithms, design appropriate user interface, test program for its correctness, and document the program (see CCI-CS-ADKD-Project-Requirements).

ITCS 6162 is a required class in ADKD Certificate Program.

Methodology: Describe when, where and how the assessment of this student learning outcome will be administered and evaluated. Describe the process the department will use to collect, analyze and disseminate the assessment data to program faculty and to decide the changes/improvements to make on the basis of the assessment data.

This outcome goal will be measured every Fall semester. The instructor of ITCS 6162 will assign a project and provide the “Requirements for Project” as the data collection instrument. The project will be used to grade a student’s knowledge using a scoring rubric with a scale of 1 to 5 across the multiple skill areas described above in the Effectiveness Measure (see CCI-CS-ADKD-Project-Rubric). The instructor will fill a CCI-CS-ADKD-CS-SLO-Assessment form reporting the performance statistics of the students and submit it to the ADKD Graduate Coordinator who will review the results, combine the statistics and if needed provide a plan of improvement agreed upon by the Program. The CS Graduate Committee will review it and report the changes made (if any) to the ADKD Graduate Coordinator who will submit the final report jointly with the impact the changes had on student learning to the Associate Dean of Administration of the College annually in the Spring Semester with a copy to all ADKD Faculty members for information and implementation of the outcome improvements.

Performance Outcome: Identify the percentage of students assessed that should be able to demonstrate proficiency in this student learning outcome and the level of proficiency expected. Example: 80% of the students assessed will achieve a score of “acceptable” or higher on the Oral Presentation Scoring Rubric. (Note: a copy of the scoring rubric, complete with cell descriptors for each level of performance, is to be submitted electronically to the designated folder on the designated shared drive.)

80% of students will achieve “Acceptable” or higher level (average score 3.0~5.0 on the rubric elements) in the programming and knowledge discovery skills demonstrated in ITCS6162 project.

<table>
<thead>
<tr>
<th>Spring 2012 and Fall 2012 Assessment Data</th>
<th>Spring 2013 and Fall 2013 Assessment Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% of students achieved “Acceptable” or higher. Average grade for the Project was 4.19</td>
<td>100% of students achieved “Acceptable” or higher. Average grade for the Project was 4.5</td>
</tr>
</tbody>
</table>

Plans for 2014: Based upon the 2013 assessment data included in this annual report, what changes/improvements will the program implement during the next academic year to improve performance on this student learning outcome?

No changes needed
### Assessment Lead’s Comments on Student Learning Outcome 1:

No comments

### Student Learning Outcome 2

(known, skill or ability to be assessed)

Students will demonstrate familiarity with terminology, depth of concepts, and up-to-date knowledge in ADKD area.

### Changes to the Student Learning Outcomes Assessment Plan:

If any changes were made to the assessment plan (which includes the Student Learning Outcome, Effectiveness Measure, Methodology and Performance Outcome) for this student learning outcome since your last report was submitted, briefly summarize the changes made and the rationale for the changes.

No changes made

### Effectiveness Measure:

Identify the data collection instrument, e.g., exam, project, paper, etc. that will be used to gauge acquisition of this student learning outcome and explain how it assesses the desired knowledge, skill or ability. A copy of the data collection instrument and any scoring rubrics associated with this student learning outcome are to be submitted electronically to the designated folder on the designated shared drive.

ITCS 6162 Knowledge Discovery in Databases written study report, which will demonstrate student familiarity with terminology, depth of concepts, and with up-to-date knowledge in ADKD area (see [CCI-CS-ADKD-Study-Report-Requirements](#)).

ITCS 6162 is a required class in ADKD Certificate Program.

### Methodology:

Describe when, where and how the assessment of this student learning outcome will be administered and evaluated. Describe the process the department will use to collect, analyze and disseminate the assessment data to program faculty and to decide the changes/improvements to make on the basis of the assessment data.

This outcome goal will be measured every Fall semester. The instructor of ITCS 6162 will ask all ADKD Certificate students to write a study report. The requirements for the Study Report (see [CCI-CS-ADKD-Study-Report-Requirements](#)) will be provided as the data collection instrument. The Study Report will be used to grade a student’s knowledge using a scoring rubric with a scale of 1 to 5 across the multiple skill areas described above in the Effectiveness Measure (see [CCI-CS-ADKD-StudyReport-Rubric](#)).

The instructor will fill a CS SLO Assessment Form (see [CCI-CS-ADKD-CS-SLO-Assessment](#)) reporting the performance statistics of the students and submit it to the ADKD Graduate Coordinator who will review the results, combine the statistics and if needed provide a plan of improvement agreed upon by the Program. The CS Graduate Committee will review it and report the changes made (if any) to the ADKD Graduate Coordinator who will submit the final report jointly with the impact the changes had on student learning to the Associate Dean of Administration of the College annually in the Spring Semester with a copy to all ADKD Faculty members for information and implementation of the outcome improvements.
**Performance Outcome:** Identify the percentage of students assessed that should be able to demonstrate proficiency in this student learning outcome and the level of proficiency expected. *Example: 80% of the students assessed will achieve a score of “acceptable” or higher on the Oral Presentation Scoring Rubric.* (Note: a copy of the scoring rubric, complete with cell descriptors for each level of performance, is to be submitted electronically to the designated folder on the designated shared drive.)

80% of students will achieve “Acceptable” or higher level (average score 3.0~5.0 on the rubric elements) in the ITCS 6162 study report.

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<thead>
<tr>
<th>Spring 2012 and Fall 2012 Assessment Data</th>
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</tr>
</thead>
<tbody>
<tr>
<td>100% of students achieved “Acceptable” or higher. The average grade for the Study Report was 4.42</td>
<td>100% of students achieved “Acceptable” or higher. Average grade for the Study Report was 4.5</td>
</tr>
</tbody>
</table>

**Plans for 2014:** Based upon the 2013 assessment data included in this annual report, what changes/improvements will the program implement during the next academic year to improve performance on this student learning outcome?

No changes needed

**Assessment Lead’s Comments on Student Learning Outcome 2:**

No comments