3-Year Academic Assessment Plan Cover Sheet

Email to: assessment@unlv.edu

Program Information

<table>
<thead>
<tr>
<th>Program Assessed</th>
<th>Master of Science in Computer science</th>
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</thead>
<tbody>
<tr>
<td>Department</td>
<td>Computer Science</td>
</tr>
<tr>
<td>College</td>
<td>Howard R. Hughes College of Engineering</td>
</tr>
<tr>
<td>Department Chair</td>
<td>Kazem Taghva</td>
</tr>
<tr>
<td>Assessment Coordinator</td>
<td>Ajoy Datta</td>
</tr>
<tr>
<td>Date Submitted</td>
<td>02/08/2019</td>
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</tbody>
</table>

Contact Person for This Plan

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Please address the following items:

- What are the student learning outcomes? Please provide a numbered list.
- Plans must include a curriculum map showing which courses will address which learning outcomes. Examples can be found here: [http://provost.unlv.edu/Assessment/map.html](http://provost.unlv.edu/Assessment/map.html)
- Which learning outcomes will be assessed in each cycle year (i.e., assessment timeline)?
- How will the learning outcomes be assessed? (Programs must use at least one direct assessment of student learning.)
- Undergraduate programs should assess at least one University Undergraduate Learning Outcome (UULO) each year, which may or may not overlap with a program learning outcome.
- Graduate programs should assess at least one outcome related to one of the following graduate level requirements each year:
  - student engagement in research, scholarship, creative expression and/or appropriate high-level professional practice.
  - activities requiring originality, critical analysis and expertise.
  - the development of extensive knowledge in the field under study.
- What is your plan for sharing the assessment results and acting on them (i.e., closing the loop)?

Please limit the narrative portion of your report to no more than four pages. You may attach appendices with data, tables, charts, or other materials as needed. Please explain the relevant conclusions from any appendices in your narrative. Please contact the Office of Academic Assessment if you have questions or need assistance.
Computer Science Master’s Degree Programs 3-Year Academic Assessment Plan (2019 – 2022)

I. Student Learning Outcomes

The program has three student learning outcomes:

SLO 1: Display knowledge of specialized areas and advanced topics in computer science.
SLO 2: Be proficient in independently analyzing, designing, and implementing an innovative computer application or research project.
SLO 3: Have the skill to present results of research both orally as well as in writing.

II. Assignment of Program Related Student Learning Outcomes to Specific

SLO 1:

M.S. students in Computer Science can take a wide variety of courses and students have much flexibility in course selection. All graduate courses in computer science include SLO 1 as an outcome. CS 677 and CS 656 offer remedial study of fundamental topics in computer science. Furthermore, there is a wide variety of courses with specialized focus:

Specifically, the course number CS 789 is reserved for special topics and most MS. students take a number of CS 789 courses. A number of the special topic courses have transitioned to a regularly numbered course, such as

CS 715 - Advanced Analysis of Algorithms
CS 733 - Geographic Data Base Systems
CS 740 - Statistical Pattern Recognition
CS 741 - Structural Pattern Recognition
CS 747 - Cryptography and Information Theory
CS 758 - Computational Geometry
CS 769 - Advanced Data Base Management
CS 772 - Software Architecture
CS 777 – Scheduling (to be approved)
CS 780 - Distributed Computing and Algorithms
CS 781 - Automated Deduction
CS 782 - Expert System Construction
CS 783 - Genetic Algorithms and Neural Networks
CS 788 - Computational Environmetrics.
SLO 1 is also reinforced in the process of writing and defending the required project or thesis.

SLO 2:

SLO 2 is central to
- CS 790: Master’s Project (can be repeated up to three credits),
- CS 791: Thesis (can be repeated up to six credits).

SLO 3:

All M.S. students prepare either (a) a thesis or (b) a project report, which is orally defended. Furthermore, a significant number of M.S. students co-author peer-reviewed conference and journal papers as a result of their project/thesis work.

Table 1 summarizes how program-level student learning outcomes are covered in the curriculum.

<table>
<thead>
<tr>
<th>Course</th>
<th>SLO 1</th>
<th>SLO 2</th>
<th>SLO 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 656</td>
<td>xx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 677</td>
<td>xx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 790</td>
<td></td>
<td>xx</td>
<td>x</td>
</tr>
<tr>
<td>CS 791</td>
<td></td>
<td>xx</td>
<td>x</td>
</tr>
<tr>
<td>CS 715, 733, 740, 741, 747, 772, 777, 780, 781, 782, 783, 788 and CS 789</td>
<td>xx</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Peer-reviewed publication</td>
<td>x</td>
<td></td>
<td>xx</td>
</tr>
<tr>
<td>Project/Thesis</td>
<td>x</td>
<td></td>
<td>xx</td>
</tr>
</tbody>
</table>

Key
x = moderate emphasis
xx = primary emphasis
III: Definition of Methods, Instruments, and Analysis of Student Learning Outcomes Assessment

Data is collected through the following instruments as detailed in Table 2.

- Tally of number of M.S graduates. This data point is used a benchmark.

- Tracking of M.S. students’ GPA currently in the program. The GPA is reflective of SLO 1.
- Pass/Fail Grades: CS 790 and CS 791. Successful completion of CS 795 and CS 798 relates to achieving SLO 2 and SLO 3.
- Many students take remedial courses CS 677 and CS 656. This is course is co-taught as CS 477 and CS 456, and assessment tool are available for these courses.
- Publications pertain mainly to SRO 2 and SRO 3.
- Graduate Exit Questionnaire: This questionnaire is given to the student shortly before the project/thesis defense.
  - The questionnaire consists of two parts:
    - A subject test to measure SLO 1, i.e. students’ breadth of knowledge in the areas of algorithms, programming languages and compilers, theory, operating systems, and computer architecture.
    - A survey to gain insight into the students’ perception of our program and to obtain suggestions for improvement from the students’ perspective.
- Alumni Survey: The survey addresses the following:
  1. Relevance of the Learning Outcomes in the Alumni’s career.
  2. Perceived quality of the program in achieving SLOs 1 – 3.
  3. Suggestions regarding improvements from a perspective gained in the work place.
Table 2: Assessment Measures and Schedule
Ph.D. in Computer Science

<table>
<thead>
<tr>
<th>Assessment Instrument</th>
<th>Learning outcomes assessed</th>
<th>Person responsible for instrument &amp; data collection</th>
<th>When and where will data be collected</th>
<th>Expected Measures (results that would indicate success)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student GPA</td>
<td>1</td>
<td>A. Datta and/or W. Bein</td>
<td>Time of graduation</td>
<td>Expected result is an average of 3.5.</td>
</tr>
<tr>
<td>CS 677/ CS 656</td>
<td>1</td>
<td>Instructor</td>
<td>Semesterly</td>
<td>70% success rate</td>
</tr>
<tr>
<td>CS 790/ CS 791</td>
<td>2 3</td>
<td>Instructor</td>
<td>Semesterly</td>
<td>90% success rate</td>
</tr>
<tr>
<td>Graduate Exit Questionnaire</td>
<td>1</td>
<td>A. Datta and/or W. Bein</td>
<td>Time of graduation</td>
<td>70% success rate</td>
</tr>
<tr>
<td>Number of Publications</td>
<td>2 3</td>
<td>A. Datta and/or W. Bein</td>
<td>Time of graduation</td>
<td>Expected result is an average of 0.5 technical publication per graduating student.</td>
</tr>
<tr>
<td>Alumni Survey</td>
<td>1 2 3</td>
<td>A. Datta and/or W. Bein</td>
<td>Every three years</td>
<td>80% positive response</td>
</tr>
</tbody>
</table>

VI: Action Plan for Continuous Program Improvement

The graduate coordinator provides a summary report each year. The report consists of two parts: (a) results and findings, and (b) suggestions for improvements. This report is reviewed in a meeting of graduate faculty members, and changes agreed to in this meeting will be implemented in the following academic year. The alumni survey will be used to receive feedback from students and act on it as warranted.

This plan will be reviewed every three years.